RWANDA EDUCATION BOARD
REPUBLIC OF RWANDA

# The Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS)

# Project Completion Report

January 2020

JAPAN INTERNATIONAL COOPERATION AGENCY

PADECO Co., Ltd.

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# Abbreviations and Acronyms

| | |
|---|---|
| 9/12YBE | 9 Years Basic Education School and/or 12 Years Basic Education School |
| AAT | Academic Achievement Test |
| AIMS | African Institute for Mathematical Sciences |
| BLF | Building Learning Foundation |
| BLS | Baseline Survey |
| CBC | Competence Based Curriculum |
| CIES | Comparative and International Education Society |
| CoP | Community of Practice |
| CPD | Continuous Professional Development |
| CS | Centre Scolaire |
| DCC | District CPD Committee |
| DDE | District Director of Education |
| DEO | District Education Officer |
| DETA | Distance Education and Teacher Education in Africa |
| DFID | Department for International Development |
| DG | Director General |
| DOS | Director of Study |
| DP | Development Partners |
| EDC | Education Development Center Inc. |
| ELS | Endline Survey |
| EP | Ecole Primaire |
| ESSP | Education Sector Strategic Plan |
| GS | Groupe Scolaire |
| HT | Head Teacher |
| ICET | International Council on Education for Teaching |
| IEE | Inspire, Educate and Empower |
| JCC | Joint Coordination Committee |
| JICA | Japan International Cooperation Agency |
| LP | Lesson Plan |
| MINALOC | Ministry of Local Government |
| MINEDUC | Ministry of Education |
| NGO | Non-Governmental Organizations |
| NT | National Trainer |
| PDM | Project Design Matrix |
| REB | Rwanda Education Board |
| RENCP | Rwanda Education NGO Coordination Platform |
| SBI | School-Based In-service teacher training |
| SBM | School-Based Mentor |
| SBMP | School-Based Mentorship Program |
| SBMT | Sector-Based Mentor Trainer |
| SBT | Sector-Based Trainer |
| SCC | Sector CPD Committee |
| SEO | Sector Education Officer |
| SET | Science and Elementary Technology |
| SIIQS | Supporting Institutionalizing and Improving Quality of SBI Activity |
| SMASSE | Strengthening Mathematics and Science in Secondary Education |
| SS | Secondary School |
| SSL | School Subject Leader |
| STEM | Science, Technology, Engineering and Mathematics |

| | |
|---|---|
| TDEL | Teacher Development and Education Leadership Working Group |
| TDM | Teacher Development and Management |
| TDM&CGC | Teacher Development and Management & Career Guidance and Counseling Department |
| TLR | Teaching and Learning Resources |
| TPD-TWG | Teacher Professional Development Technical Working Group |
| TTC | Teacher Training Colleges |
| TVET | Technical and Vocational Education and Training |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNICEF | United Nations Children's Fund |
| UR-CE | University of Rwanda, College of Education |
| USAID | United States Agency for International Development |
| VSO | Voluntary Service Overseas |
| WALS | World Association of Lesson Studies |

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# 1. Overview of the Project

## 1.1 Background of the Project

The Government of Rwanda promotes science at all levels of its education system, in the pursuit to become a middle-income country by the year 2020 (Rwanda Vision 2020). The Government executed two major education reforms in the past decade. The first one is the shift of language of instruction from French to English in 2009, which necessitated training for in-service teachers.

With this context, the Ministry of Education (MINEDUC) through Rwanda Education Board (REB) considered capacity enhancement of in-service teachers as a main priority and conducted the *Project of Strengthening Mathematics and Science in Secondary Education (SMASSE)* from 2008 to 2011 in collaboration with Japan International Cooperation Agency (JICA). It aimed at improving lessons for science and math at secondary schools. SMASSE successfully achieved its project purpose as the trained teachers improved their lesson performance significantly. However, the trainees did not fully share the knowledge and skills acquired through the training with their colleagues. Consequently, the *Project of Strengthening School-based Collaborative Teacher Training (SBCT)* was implemented from 2013 to 2015 to improve the quality of lower secondary education by promoting School-Based In-service teacher training (SBI) at lower secondary schools. The SBCT Project aimed at improving the quality of education through continuous professional development for teachers by implementing SBI. SBCT confirmed that 98.8% of lower secondary schools across the 19 districts which submitted reports had conducted SBI in their school.

The second major education reform was the introduction of a new Competence-Based Curriculum (CBC) from pre-primary to upper secondary levels in 2016. This called for a paradigm shift in teaching to align with national aspirations and to ensure that the knowledge, skills, attitudes and values acquired in schools meet the challenges of the 21st century. CBC requires large-scale efforts to equip teachers with this new way of teaching. In addition, the SBCT Project identified that 1) SBI had not yet fully been institutionalized, 2) SBI implementation was still not sufficient and 3) SBI monitoring system was not yet functioning well. In response to the situation, REB and JICA implemented the three-year *Project for Supporting Institutionalizing and Improving Quality of SBI (SIIQS)* from January 2017 to December 2019, aiming at 1) enhancing teacher's knowledge and skills on CBC and 2) establishing coherent mechanism of Continuous Professional Development (CPD) at school, sector, district and national levels.

## 1.2 Revision of the Project Design Matrix and Plan of Operation

The Project Design Matrix (PDM) was amended to define the narrative summary more clearly and specify quantitative **objectively verifiable indicators**, based on current conditions around the Project. The Plan of Operation was also revised according to the Work Plan submitted to REB at the 4th Joint Coordination Committee (JCC) in January 2019, along with amended PDM. The original PDM is attached in Appendix 1 and the revised version (version 2) is attached in Appendix 2.

## 1.3 Outline of the Project

The outline of the Project after the revision of PDM is as follows.

## Table 1-1: Project Outline

| | |
|---|---|
| Project Title | The Project for Supporting Institutionalizing and Improving Quality of SBI Activity |
| Project Period | January 2017 to December 2019 (Three years) |
| Overall Goal | Students' learning process in classroom is improved. |
| Project Purpose | Implementation of CBC-based lesson in the classroom is strengthened through SBI activities. |
| Outputs | 1. Teachers' understanding of CBC-based lesson implementation is enhanced.<br>2. Problem-solving capacities are enhanced at school, sector, district, and national level. |
| Activities | 0-1 Baseline survey<br>0-2 End-line survey<br>1-1 To develop a CBC-based lesson guideline (including lesson planning manual, tips, etc.).<br>1-2 To develop CBC-based lesson samples (e.g. video).<br>1-3 To develop a guideline on CBC-based lesson assessment.<br>1-4 To conduct workshops regarding CBC-based lesson implementation.<br>1-5 To support model schools to develop good practices on CBC-based lessons.<br>1-5.1 To support Lesson Study to share good CPD practices nationwide.<br>1-5.2 To measure learners achievement in Lesson Study.<br>2-1 To develop a practical guideline on functioning DCC.<br>2-2 To raise awareness about the importance of DCC and to enhance understanding of the roles (e.g. workshop).<br>2-2.1 To conduct workshops on DCC.<br>2-2.2 To support DCC in conducting an Open Day to share good CPD practices.<br>2-3 To develop a CPD implementation manual (including the procedure).<br>2-4 To develop a guideline on observing CBC-based lessons.<br>2-5 To design monitoring forms (including electronic form, simple and user-friendly) by reviewing the existing ones and conducting a rapid survey.<br>2-6 To conduct training for REB by JICA Experts to develop the capacity to collect and analyze data, and to develop solutions.<br>2-6.1 To enhance capacity of REB to collect and analyze data and to develop solutions through the need assessment survey of CBC training.<br>2-7 To conduct training for REB and National Trainers (including professors of UR-CE) to develop the capacities to evaluate CBC-based lessons by JICA Experts.<br>2-8 To conduct training for HT/SEO/DEO to develop the capacities to evaluate CBC-based lessons, to collect and analyze data, and to develop solutions.<br>2-9 To conduct monitoring on the situation of CBC and CPD implementation (including email questionnaire survey and technical advice).<br>2-9.1 To collect quantitative data of CBC and CPD implementation through termly monitoring.<br>2-9.2 To collect qualitative data of CBC and CPD implementation through quarterly monitoring.<br>2-10 To develop materials to address challenges identified in the reports submitted to REB.<br>2-10.1 To elaborate analysis reports of monitoring (including good CPD practices).<br>2-11 To conduct a training based on the materials developed above for REB and National Trainers.<br>2-11.1 To conduct a national DCC/SCC forum to enhance monitoring mechanism. |
| Project site | Kigali (REB), Nationwide (schools)<br>Model site: EP Buhande, GS Kabuye Catholique, GS Mukarange Catholique, GS APAGIE Musha, GS St Aloys Rwamagana, GS Notre Dame des Apôtres Rwaza (86 teachers) |
| Beneficiaries | Primary, lower secondary, and upper secondary schools (74,584 teachers) |
| Counterpart | MINEDUC through Teacher Development & Management and Career Guidance & Counseling (TDM&CGC) Department in REB. |

# 2. Inputs of the Project

## 2.1 Overview of the Inputs

The overview of the inputs is shown in Table 2-1 below (see Appendix 3 for the complete list of equipment).

**Table 2-1: Outline of the Inputs**

| Inputs | |
|---|---|
| Japanese side | Experts: total of 8 (36.10 MM)<br>Team Leader/Pedagogy, Deputy Team Leader/ Institutional Development, Mathematics Education, Mathematics Education 2, Science Education, Educational Evaluation, Problem-solving Cycle Improvement, Monitoring/Project Coordinator |
| | Equipment: JPY 1,330,317<br>Laptop PCs (3), All-in-one printer (1), Mobile projector (2), Action camera (1) |
| Rwandan side | Counterparts |
| | Data and information related to the Project |
| | Office, Utility bills |

Note: Two experts were engaged as "Institutional Development". Two experts were engaged as "Mathematics Education".
One of the mobile projectors was lent by JICA.

## 2.2 Assignment of the Experts

The assignment schedule of the Japanese Experts is shown in Figure 2-1.

## 2.3 Local Staff

The Project employed local staff listed in Table 2-2 for efficient project implementation.

**Table 2-2: List of Local Staff**

| Title | Name | Period | Note |
|---|---|---|---|
| Programme Officer | Ms. Berthine GIKUNDIRO | 10 Jan 2017 - 31 Jan 2018 | |
| | Ms. Clarisse DUSABIMANA | 6 Feb 2018 - 18 Oct 2019 | |
| Monitoring Officer 1 | Mr. Hashituky HABIYAREMYE | 15 May 2017- 20 Dec 2019 | Part time in 2017 and 2018<br>Full time in 2019 |
| Monitoring Officer 2 | Mr. Kizito NDIHOKUBWAYO | 15 May 2017- 20 Dec 2019 | Part time |
| Education Advisor | Mr. Antoine MUTSINZI | 25 Jan 2019 - 13 Dec 2019 | Part time |
| Secretary/ Accountant | Ms. Anathalie NIYIDUKUNDA | 1 Feb 2017 - 31 Dec 2019 | |
| Research Assistant | Mr. Hashituky HABIYAREMYE<br>Mr. Kizito NDIHOKUBWAYO | 8 Mar 2017 - 13 Apr 2017 | Temporary staff |
| | Mr. Augustin NDAYISEYE<br>Mr. Pascal RWAYITARE<br>Mr. Sharif NIZEYIMANA | 19 Jun 2019 - 16 Aug 2019 | Temporary staff |
| Supervisor of Enumerators | Mr. Jean Claude RUKUNDO | 23 Feb 2019 - 1 Mar 2019 | Temporary staff |
| Online Questionnaire Developer | Mr. Serge RUGIRA | 23 Feb 2019 | Temporary staff |

| Title | Name | Period | Note |
|---|---|---|---|
| Enumerator | Mr. Aimable MUVUNYI<br>Mr. Alexis NGABONZIZA<br>Mr. Eric AKIMANA<br>Ms. Angelique BAGWIRE UWERA<br>Ms. Beny Grace BIMENYIMANA<br>Mr. Robert HABIMANA<br>Ms. Giselle HATANGIMANA<br>Mr. Fidele IRAGUHA<br>Ms. Suzanne MUKAMAJORO<br>Mr. Jean Boris MUTABARUKA<br>Mr. Jules RUTABINGWA<br>Mr. Arsene SHEMA<br>Mr. Maxime SHEMA<br>Ms. Eurempie TWIZEYIMANA<br>Mr. Faustin UKUNDIMANA<br>Ms. Christine UWIMANA | 24 Feb 2019 - 1 Mar 2019 | Temporary staff |
| Video transcription | Mr. Lambert RUKUNDO<br>Mr. Pascal RWAYITARE<br>Mr. Sharif NIZEYIMANA | 11 Jun 2019 - 16 Aug 2019 | Temporary staff |

| | Name | Position | JICA Rank | | # of travel | 2017 | 2018 | 2019 | 2020 | Total day | MM total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 2 3 4 5 6 7 8 9 10 11 12 | 1 2 3 4 5 6 7 8 9 10 11 12 | 1 2 3 4 5 6 7 8 9 10 11 12 | 1 | | |
| In Rwanda | Ryuichi SUGIYAMA | Team Leader/Pedagogy | 2 | Plan | 9 | (24) (24) (24) (24) | (24) (24) (24) | (24) (24) (24) (24) | | 216 | 7.20 |
| | | | | Actual | 10 | 10 2 5 28 24 14 (22) (2) (24) (7) (14) | 17 18 11 1 9 2 (12) (18) (21) (1) (22) (2) | 7 26 12 22 28 5 15 26 24 18 10 15 (20) (11) (3) (17) (7) (14) | | 217 | 7.23 |
| | Kyoko Yoshikawa IWASAKI | Deputy Team Leader/Institutional Development | 4 | Plan | 3 | (18) (21) (21) | | | | 60 | 2.00 |
| | | | | Actual | 3 | 10 29 17 4 19 9 (20) (14) (4) (12) (9) | | | | 59 | 1.97 |
| | Ryuichi SUGIYAMA | Institutional Development | 4 | Plan | 6 | | (21) (21) (21) (21) | (21) (21) (21) (21) | | 126 | 4.20 |
| | | | | Actual | 6 | 11 1 (21) (1) | 6 1 7 25 3 22 (26) (1) (19) (20) | 7 24 29 2 9 (20) (2) (16) (1) | | 127 | 4.23 |
| | Kenji OHARA | Mathematics Education | 3 | Plan | 2 | (39) | (20) | | | 59 | 1.97 |
| | | | | Actual | 2 | 29 30 (3) (30) | 4 29 (26) | | | 59 | 1.97 |
| | Satoshi KUSAKA | Mathematics Education | 3 | Plan | 1 | | | (25) | | 25 | 0.83 |
| | | | | Actual | 1 | | | 4 28 (25) | | 25 | 0.83 |
| | Tateo ABE | Mathematics Education 2 | 3 | Plan | 1 | (14) | | | | 14 | 0.47 |
| | | | | Actual | 1 | 18 1 (13) (1) | | | | 14 | 0.47 |
| | Keiichi NAGANUMA | Science Education | 3 | Plan | 5 | (20) (20) (20) | (15) | (15) | | 90 | 3.00 |
| | | | | Actual | 6 | 15 20 15 3 12 1 21 2 17 24 (17) (3) (19) (1) (11) (2) (8) | | 10 23 18 1 (14) (14) (1) | | 90 | 3.00 |
| | Yumiko ONO | Educational Evaluation | 3 | Plan | 6 | (14) (14) | (14) (14) | (14) (14) | | 84 | 2.80 |
| | | | | Actual | 6 | 12 26 19 31 (15) (13) | 9 16 28 2 27 5 (12) (2) (5) (5) | 5 14 26 3 11 26 (13) (3) (16) | | 84 | 2.80 |
| | Chikako KASAI | Problem-solving Cycle Improvement | 3 | Plan | 3 | (21) | (21) (21) | | | 63 | 2.10 |
| | | | | Actual | 3 | 25 14 (6) (14) | 3 16 12 9 (14) (20) (9) | | | 63 | 2.10 |
| | Sayaka MATSUZUKI | Monitoring/Project Coordinator | 4 | Plan | 9 | (40) (40) (40) (40) (40) (40) (40) | (37) (40) (40) (40) | (30) (40) (33) | | 340 | 11.33 |
| | | | | Actual | 11 | 10 18 1 1 10 22 19 14 2 14 3 16 (22) (18) (31) (1) (22) (22) (13) (14) (30) (14) (14) | 17 10 6 6 19 13 21 16 (15) (28) (10) (25) (6) (13) (13) | 3 8 4 25 26 2 21 28 16 15 (15) (15) | | 341 | 11.37 |
| | | | | | | | | | | Plan | 1077 | 35.90 |
| | | | | | | | | | | Actual | 1079 | 35.97 |
| In Japan | Ryuichi SUGIYAMA | Team Leader/Pedagogy | 2 | Plan | | (1) | | | (1) | 2 | 0.10 |
| | | | | Actual | | 3 (1) | | | 18 (0.33) | 1.33 | 0.07 |
| | Kyoko Yoshikawa IWASAKI | Deputy Team Leader/Institutional Development | 4 | Plan | | (1) | | | | 1 | 0.05 |
| | | | | Actual | | 3 (1) | | | | 1 | 0.05 |
| | Ryuichi SUGIYAMA | Institutional Development | 4 | Plan | | | | | (1) | 1 | 0.05 |
| | | | | Actual | | | | | 17 (0.33) | 0.33 | 0.02 |
| | | | | | | | | | | Plan | 4 | 0.20 |
| | | | | | | | | | | Actual | 2.66 | 0.13 |
| | | | | | | | | | | Plan | 36.10 | |
| | | | | | | | | | | Actual | 36.10 | |
| Reports | | | | | | W/P, Monitoring Sheet Ver.1 | Monitoring Sheet Ver.2 | Monitoring Sheet Ver.3 | Monitoring Sheet Ver.4 | Monitoring Sheet Ver.5 | Monitoring Sheet Ver.6 | Project Completion Report | |

Legend : Plan Actual Cost borne by PADECO

**Figure 2-1: Assignment Schedule**

# 3. Activities of the Project

The Project activities were conducted according to the detailed work plan and work flow chart as attached in Appendix 4 and Appendix 5 respectively. The following sections describe the activities in detail.

## 3.1 Activity 0-1: Baseline Survey

The Baseline Survey (BLS) was conducted from March to June 2017. It aimed at grasping the current situation, collecting baseline data for benchmarking to monitor the progress of the Project, and identifying potential obstacles.

**Table 3-1: Sample Size of Lesson Videos, Lesson Plans and AATs in BLS**

| School | District | School Type | Survey item | Primary | | Lower Secondary | | Upper Secondary | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Math | SET | Math | Science | Math | Science |
| CS Muhe * | Musanze | Primary | Video/LP | P5 | | | | | |
| GS Muhoza I * | | 12YBE | Video/LP | | P5 | | | | |
| GS Notre Dame des Apôtres Rwaza | | Secondary (girls) | Video/LP | | | | | | S5(chm) |
| | | | AAT | | | 34 | 44 | 51 | 50 |
| EP Buhande | Rulindo | Primary | Video/LP | P5 | | | | | |
| | | | AAT | 21 | 21 | | | | |
| GS Kinihira * | | 12YBE | Video/LP | P1 | | | | | |
| Lycée Notre Dame de la Visitation | | Secondary (girls) | Video/LP | | | | S2(chm) | | |
| | | | AAT | | | 25 | 22 | 28 | 28 |
| EP Rubengera I * | Karongi | Primary | Video/LP | P4 | | | | | |
| GS Bubazi | | 9YBE | Video/LP | | | | S2(chm) | | |
| | | | AAT | 35 | 36 | 98 | 92 | | |
| GS Nyarubuye * | | 12YBE | Video/LP | | | | S2(phy) | | |
| EP Bukinanyana ADEPR | Nyabihu | Primary | Video/LP | P4 | | | | | |
| | | | AAT | 56 | 53 | | | | |
| GS St Raphael Rambura | | 12YBE | Video/LP | | | S2 | | | |
| GS Rambura Garçon | | Secondary | Video/LP | | | | | | S5(bio) |
| | | | AAT | | | 49 | 62 | 90 | 60 |
| EP Remera * | Muhanga | Primary | Video/LP | | P4 | | | | |
| GS Munyinya * | | 12YBE | Video/LP | | | S1 | | | |
| EP Runyinya * | Rwamagana | Primary | Video/LP | P5 | | | | | |
| GS APAGIE Musha | | Secondary | Video/LP | | | | S2(phy) | | |
| | | | AAT | | | 64 | 53 | 45 | 52 |
| GS St Aloys Rwamagana** | | Secondary | Video/LP | | | | | | |
| | | | AAT | | | 67 | 71 | 120 | 78 |
| EP Gasabo | Gasabo | Primary | Video/LP | | P4 | | | | |
| GS Kabuye Catholique ** | | 9YBE | Video/LP | | | | | | |
| | | | AAT | 143 | 170 | | | | |
| GS Gihogwe Catholique *** | | 12YBE | Video/LP | | | | S2(bio) | S4 | |
| | | | AAT | 63 | 66 | 161 | 68 | 24 | |
| GS Mukarange Catholique ** | Kayonza | 12YBE | AAT | 36 | 36 | 98 | 154 | 80 | 34 |
| Total | # of Lesson Recorded | | | 6 | 3 | 2 | 5 | 1 | 2 |
| | # of Lesson Plans Collected**** | | | 6 | 1 | 1 | 5 | 1 | 2 |
| | # of Participants in AAT | | | 354 | 382 | 596 | 566 | 438 | 302 |

* Only lesson observation was conducted.

** Only AAT was administered. GS Kabuye Catholique was a 9YBE, but no AAT was administered at lower secondary levels.

*** GS Gihogwe Catholique was a 12YBE but it did not have science subjects in upper secondary levels. Therefore, no AAT was administered in upper secondary science.

**** Lesson plans were not available for GS Muhoza P5 SET, EP Gasabo P4 SET and GS Munyinya S1 math.

The BLS was composed of lesson observation (basically one lesson per school), Academic Achievement Tests (AATs)[1] for P4/S1/S4 learners and questionnaire/interview with Head Teachers (HTs) and teachers. 20 schools across seven districts were visited. The national exam results were also collected from REB and analyzed for correlations between the teachers' perception of CPD and performance of the learners. Table 3-1 shows the sample size of lesson videos and lesson plans collected and the sample size of AATs. Table 3-2 shows the sample size of questionnaires and interviews for teachers and HTs. The results of the survey were consolidated in the Baseline Survey Report (Appendix 6).

**Table 3-2: Sample Size of Questionnaire and Interview at Schools in BLS**

| School Name | School Type | Questionnaire (Teachers) | Focus Group Interview (Teachers) | Questionnaire & Interview (HTs) |
|---|---|---|---|---|
| CS Muhe | Primary | 7 | 3 | 1 |
| GS Muhoza I | 9/12 | 6 | 6 | 1 |
| GS Notre Dame des Apôtres Rwaza | Secondary | 12 | 1 | 1 |
| EP Buhande | Primary | 9 | 7 | 1 |
| GS Kinihira | 9/12 | 9 | 9 | 1 |
| Lycée Notre Dame de la Visitation | Secondary | 6 | 6 | 1 |
| EP Rubengera I | Primary | 9 | 9 | 1 |
| GS Bubazi | 9/12 | 8 | 8 | 1 |
| GS Nyarubuye | 9/12 | 7 | 7 | 1 |
| EP Bukinanyana ADEPR | Primary | 4 | 4 | 1 |
| GS St Raphael Rambura | 9/12 | 8 | 8 | 1 |
| GS Rambura Garçon | Secondary | 10 | 10 | 1 |
| EP Remera | Primary | 15 | 15 | 1 |
| GS Munyinya | 9/12 | 15 | 15 | 1 |
| EP Runyinya | Primary | 5 | 5 | 1 |
| GS APAGIE Musha | Secondary | 4 | 5 | 1 |
| GS St Aloys Rwamagana | Secondary | 12 | 0 | 1 |
| EP Gasabo | Primary | 12 | 12 | 1 |
| GS Kabuye Catholique | 9/12 | 11 | 0 | 1 |
| GS Gihogwe Catholique | 9/12 | 9 | 9 | 1 |
| | Total | 178 | 139 | 20 |

## 3.2 Activities for Output 1

### 3.2.1 Activity 1-1: To develop a CBC-based lesson guideline (including lesson planning manual, tips, etc.)

In cooperation with other development partners (DPs), the JICA experts took part in developing a guideline on CBC-based lesson. The guideline was intended to be used for Phase III CBC training. National Trainer (NT) candidates and DPs participated in a training material development workshop from 17th to 24th September 2017.

As REB prefers training materials which include narration and videos visualizing practical techniques for lesson improvement, they decided to create audio-visual material. The workshop participants were assigned to respective groups, including an audio-visual material development group and assessment methods development groups for each subject, among others. Using draft materials prepared by the SIIQS team, the JICA experts facilitated the activities to produce a prototype, which included CBC-based lesson guideline (Activity 1-1), CBC-based lesson samples

[1] The AATs were conducted only at schools which were selected as model schools as of 2017. The AATs for GS Mukarange Catholique, GS Notre Dame des Apôtres Rwaza and schools set as "control group" later in the Endline Survey in 2019 were administered in February 2019 to enable comparisons between the "treatment group" and "control group". Therefore, the results were not analyzed in the BLS report. For other schools, AATs were not conducted.

(Activity 1-2, see 3.2.5 for more details), a guideline on CBC-based lesson assessment (Activity 1-3), a SBI implementation manual (Activity 2-3) and a guideline on observing CBC-based lessons (Activity 2-4). The prototype was revised after the training for NT candidates and was finalized as official training material (as mentioned in 3.2.4, see below image). A user guide was also developed for trainers of all levels to understand how to use the audio-visual material. The audio-visual material and the user guide are attached in DVDs 1 and 2, and Appendix 7 respectively.

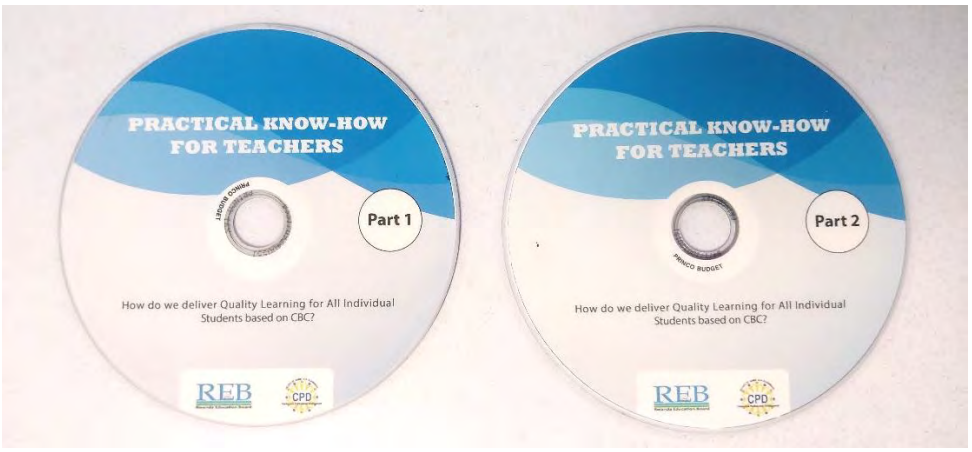



**Figure 3-1: Image of Audio-Visual Material**

### 3.2.2 Activity 1-2: To develop CBC-based lesson samples (e.g. video)

CBC-based lesson samples for the Phase III CBC training were developed through Lesson Study activities at model schools from May to July 2017. The research lessons (which were actual lessons that model school teachers conducted after revising their original lesson plans based on advice from JICA experts) were videotaped and edited into model lessons. Lesson samples were included in the audio-visual material.

### 3.2.3 Activity 1-3: To develop a guideline on CBC-based lesson assessment

The theme of the Phase III CBC training was assessment. The Project found in the BLS that teachers did not carry out formative assessment in effective ways, so formative assessment techniques were focused on helping teachers to understand how learners learn, and therefore improve their teaching techniques accordingly. Thus, the JICA experts in cooperation with United Nations Children's Fund (UNICEF) developed guidelines for formative assessment and included them in the audio-visual material for the Phase III CBC training.

### 3.2.4 Activity 1-4: To conduct workshops regarding CBC-based lesson implementation

#### (1) Phase III CBC Training material development workshop

The Project assisted REB in developing a concept note of the Phase III CBC training. Following the schedule specified in it, a training material development workshop for the Phase III CBC cascade training was conducted for eight days in September 2017. NT candidates were involved in it.

#### (2) Phase III CBC Training for National Trainer candidates

By using a prototype developed in the workshop, training for 141 NT candidates was conducted for six days from 2nd to 7th November 2017 to get them familiarized with the material, and to get necessary feedback to make a final product. At the same time, the JICA experts developed a pre-test and post-test to select NTs that were expected to train Sector-Based Trainers (SBT), so as to guarantee a standard level of training. Based on the results, the top 100 participants in the post test were officially appointed as NTs by REB.

#### (3) Phase III CBC Training for Sector-Based Trainers

The Phase III CBC training for SBTs was conducted across ten training centers from 10th to 17th January 2018. 100 qualified NTs were assigned equally to each center, and facilitated the training, using training materials (including the audio-visual material). They trained 3,835 out of 4,160 SBTs (92.2%), and among them 3,785 (91.0%) attended the post-test. NTs, REB staff and the Project formed a Joint Operation Committee at each center and administered training for SBTs. They reported the status of the training through reports every day. The JICA experts assisted in the evaluation of SBTs by making pre and post-tests of the training. SBTs showed improved performance in the post-tests.

#### (4) Online Assessment Course of the Three-year CBC Training

The JICA experts assisted in the development of an online assessment course for the three-year CBC training for all teachers to assess the impact of the training. This was embedded in REB's e-learning platform. They developed the overall framework of the assessment course, contents of each unit and assessment tasks composed of questions and essays. The content and tasks were built on previous CBC training, and thus, participants who participated in the training and went through this course can achieve passing marks of 70% in assessment questions without difficulty. 60 teachers were selected from all districts as the first cohort. They took the course in a workshop in November 2018 to validate its usability and appropriateness. The 60 teachers were then to disseminate the course to colleagues in their respective areas.

### 3.2.5 Activity 1-5: To support model schools to develop good practices on CBC-based lessons

#### (1) Activity 1-5-1: To support Lesson Study to share good CPD practices nationwide

In 2017, five model schools were selected based on school visits during the BLS. These were; GS Kabuye Catholique, EP Buhande, Lycée Notre Dame de la Visitation[2], GS St Aloys Rwamagana and GS APAGIE Musha. The JICA experts supported the schools by organizing Lesson Study in mathematics and science. For 2018, four schools were supported in conducting Lesson Study in mathematics. These were; EP Buhande, GS APAGIE Musha, GS Notre Dame des Apôtres Rwaza and GS Mukarange Catholique. In 2019, five model schools (EP Buhande, GS Mukarange Catholique, GS St Aloys Rwamagana[3], GS APAGIE Musha and GS Notre Dame des Apôtres Rwaza) continued to conduct Lesson Study in the first and second terms. The details of the model schools and summary of activities are outlined in Table 3-3 and Table 3-4. A total of 86 teachers who taught math or science subjects in model schools continuously participated in Lesson Study.

The research lessons of Lesson Study in 2017 were videotaped and edited into model lessons, and some of them were used in the audio-visual material for the Phase III CBC training (as mentioned in 3.2.1). Some research lesson videos were also edited and uploaded to the REB's e-learning

[2] Lycée Notre Dame de la Visitation was removed from the model schools before starting Lesson Study in 2018 due to difficulty in continuing activities.
[3] GS St Aloys Rwamagana did not conduct Lesson Study in the second term.

platform as model lesson samples so as to address challenges in CBC identified in various reports (Activity 2-10).

**Table 3-3: Outline of Lesson Study Activities in Model Schools**

| School | School Type | Treated from | Lesson Study Support | | | |
|---|---|---|---|---|---|---|
| | | | 2nd term 2017 | 2nd term 2018 * | 1st term 2019 | 2nd term 2019 |
| EP Buhande | Primary | 2017 | ✓ | ✓ | ✓ | ✓ |
| GS Kabuye Catholique | 9YBE | 2013 | ✓ | | ✓ | |
| GS Mukarange Catholique | 12YBE | 2018 | | ✓ | ✓ | ✓ |
| GS APAGIE Musha | Secondary | 2017 | ✓ | ✓ | ✓ | ✓ |
| GS St Aloys Rwamagana | Secondary | 2013 | ✓ | | | ✓ |
| GS Notre Dame des Apôtres Rwaza | Secondary (girls) | 2018 | | ✓ | ✓ | ✓ |

* Math only

**Table 3-4: Summary of Activities**

| Stage | Description |
|---|---|
| Stage 1: Problem Identification | Form mathematics and science Lesson Study groups where teachers discuss challenges they are facing, along with the causes and solutions. Then they agree on a challenge to be dealt with, and one unit to work on in the Lesson Study. |
| Stage 2: Lesson Plan Development | Using a lesson plan format, groups of teachers develop a lesson plan for the unit selected at Stage 1. |
| Stage 3: Micro-teaching | One teacher practices the lesson according to the lesson plan in front of other teachers. Colleagues become active "students" who will later assess his/her performance. After the lesson, they discuss what went well and what should be improved. |
| Pre-test | The JICA experts prepare pre-tests related to the unit of each Lesson Study group, and administer it in the class before research lessons to compare with post-test results. |
| Stage 4: Research Lesson | Based on the revised lesson plan, the same teachers conduct a lesson in an actual class and others observe. |
| Post-test | The JICA experts prepare and administer post-tests around two weeks after the research lesson. |
| Stage 5: Post-lesson Reflection | After the lessons, the teachers discuss further areas for improvement and reflect them in the lesson plan. |

In order to create and foster a Community of Practice (CoP) among teachers of model schools, the Project organized a sharing workshop in Kigali on 18th May 2019. All HTs, Directors of Study (DOS) and teachers participating in Lesson Study as well as District Directors of Education (DDEs)/District Education Officers (DEOs) and Sector Education Officers (SEOs)[4] who oversee attended the workshop and shared their experiences with Lesson Study. They discussed the importance of Lesson Study, the challenges in implementing CPD, the use of pre- and post-tests, and the roles of districts and sectors to promote good practices of Lesson Study.

The Project also supported exchange visits between model schools in June 2019. The purpose was to promote learning and collaboration across model schools by visiting actual math and science lessons developed through Lesson Study. EP Buhande and GS Mukarange Catholique visited each other's primary level lessons, while GS Notre Dame des Apôtres Rwaza and GS APAGIE Musha visited each other's secondary level lessons. Relevant DDEs and SEOs also participated.

[4] SEOs were renamed Sector Education Inspectors (SEIs) in January 2019 but this report uses "SEOs" to be consistent with the description in the PDM.

#### (2) Activity 1-5-2: To measure learner's achievements in Lesson Study

Pre- and post-tests were developed and administered in each Lesson Study cycle to measure learner's achievements. It also intended to help teachers understand the importance of collecting evidence to gauge if the learning objectives have been achieved or not.

Pre- and post-test questions were composed of multiple-choice questions. The questions were aimed at checking learners' prerequisite knowledge and skills for the lesson, comprehension of the lesson, and higher order thinking ability. Although post-test results were lower than pre-test results at some schools during some Lesson Study cycles, teachers tried to figure out possible reasons for that during post-lesson reflection at their own schools and the sharing workshop in May 2019. Identified reasons were poor lesson preparation by teachers, confusing teaching approach by teachers, and learners absenteeism. Through the process, teachers paid more attention to learning outputs than before and they tried to consider better classroom practices. As the result of these efforts, the average scores of post-test improved in all lessons as shown in Table 3-5 and Table 3-6.

**Table 3-5: Pre- and Post-test Results in Mathematics in the Second Term of 2019**

| EP Buhande (P5) | | | GS Mukarange Catholique (P5) | | | GS Mukarange Catholique (S2) | | | GS APAGIE Musha (S2) | | | GS APAGIE Musha (S5) | | | GS Notre Dame des Apôtres Rwaza (S5) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pre | Post | Diff | Pre | Post | Diff | Pre | Post | Diff | Pre | Post | Diff | Pre | Post | Diff | Pre | Post | Diff |
| 27.6 | 42.3 | 14.8 | 31.0 | 38.5 | 7.5 | 35.0 | 39.0 | 4.0 | 45.7 | 48.5 | 2.8 | 61.0 | 72.5 | 11.5 | 56.3 | 62.7 | 6.4 |

Full marks=100

**Table 3-6: Pre- and Post-test Results in Science in the Second Term of 2019**

| EP Buhande (P5) | | | GS Mukarange Catholique (P5) | | | GS Mukarange Catholique (S2) | | | GS APAGIE Musha (S2) | | | GS APAGIE Musha (S4) | | | GS Notre Dame des Apôtres Rwaza (S4) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pre | Post | Diff | Pre | Post | Diff | Pre | Post | Diff | Pre | Post | Diff | Pre | Post | Diff | Pre | Post | Diff |
| 28.9 | 30.9 | 2.0 | 25.4 | 30.5 | 5.1 | 25.0 | 30.8 | 5.8 | 34.4 | 43.4 | 9.0 | 34.3 | 53.1 | 18.8 | 32.4 | 38.8 | 6.4 |

Full marks=100

## 3.3 Activities for Output 2

### 3.3.1 Activity 2-1: To develop a practical guideline on functioning DCC

Materials for District CPD Committee (DCC) orientation and problem analysis workshops were prepared to raise awareness about the importance of DCCs and to enhance understanding of the roles and responsibilities (referring to the DCC concept note issued in July 2016). The developed materials for DCC orientation and problem-analysis workshops is attached in Appendix 8.

The Project and DPs interested in DCC reviewed and updated the DCC concept note to align with the latest situation surrounding DCCs and Sector CPD Committees (SCCs). They collected comments on a revised concept note at the National DCC Forum as discussed later. The Project incorporated them and finalized the concept note. The revised concept note for DCCs and SCCs is attached in Appendix 9.

### 3.3.2 Activity 2-2: To raise awareness about the importance of DCC and to enhance understanding of the roles (e.g. workshop)

#### (1) Activity 2-2-1: To conduct workshops on DCC

The Project visited four DCC pilot districts (Gasabo, Musanze, Rulindo, Rwamagana) and eleven other districts to conduct DCC orientations and problem analysis workshops. Since June 2018,

the Project has collaborated with Building Learning Foundation (BLF), which sponsored DCC orientations and workshops. The Project has since facilitated problem analysis workshops. The workshops consisted of problem analysis, objective analysis and action planning. The JICA experts reviewed outputs of the workshops and gave feedback for DCCs on where to take action according to their own action plans. They also visited pilot districts for follow-up meetings. The schedule of the DCC support activities is shown in Table 3-7.

**Table 3-7: Schedule of DCC Support Activities**

| District | Date of Orientation | Date of Workshop | Date of Follow-up Meeting |
|---|---|---|---|
| Rulindo | 21 Apr 2017 | 5 Jul 2017 | 11 Sep 2017 |
| Gasabo | 30 Apr 2017 | 30 Jun 2017 | 24 Oct 2017 |
| Musanze | 2 May 2017 | 29 Jun 2017 | 12 Oct 2017 |
| Rwamagana | 3 May 2017 | 6 Jul 2017 | 12 Sep 2017 |
| | Conducted by BLF | 27 Feb 2019* | - |
| Kayonza | 2 Mar 2018 | 22 Jun 2018* | - |
| Nyarugenge | 10 Mar 2018 | 10 Mar 2018 | - |
| Muhanga | 21 May 2018 | 21 May 2018 | - |
| Gicumbi | 28 May 2018 | 28 May 2018 | - |
| Burera | 4 Jun 2018* | 4 Jun 2018, 6 Jul 2018* | - |
| Nyabihu | 5 Jun 2018* | 4 Jun 2018, 24 Aug 2018* | - |
| Rubavu | 2 Aug 2018* | 2 Aug 2018* | - |
| Karongi | 13 Sep 2018* | 13 Sep 2018* | - |
| Gisagara | 6 Dec 2018* | 6 Dec 2018* | - |
| | Conducted by BLF | 12 - 14 Mar 2019* | - |
| Nyanza | 7 Dec 2018* | 7 Dec 2018* | - |
| Kirehe | Conducted by BLF | 27 Feb 2019* | - |

* The orientations and workshops were financed by BLF. In those workshops, BLF facilitated the orientations and the SIIQS Project facilitated workshops.

With financial support from the JICA Rwanda office and VVOB, the Project held the National DCC Forum on 26th January 2018, to raise awareness of the importance of DCCs/SCCs among stakeholders and accelerate their activities. Five representatives from each district (DDE, DEO, SEO, HT, SBT), HTs of all Teacher Training Colleges (TTCs), representatives from MINEDUC/REB and concerned DPs were invited. 180 people attended.

The program was prepared through a series of discussions with VVOB. It included the concept of CPD and challenges for DCCs/SCCs, group work on roles and responsibilities of DCCs and presentations by six DPs to share their experience and programs. The group work was facilitated by a team of DPs including VVOB, BLF, UNICEF/ Inspire, Educate and Empower (IEE) as well as the JICA Rwanda office and SIIQS Project. The Project sorted out the comments and reflected them in the DCC concept note. Furthermore, the DPs agreed to meet at a DP coordination workshop on a quarterly basis.

The Project conducted a questionnaire for CPD advisors during the third quarter DCC/SCC monitoring in December 2019 and received 19 responses. It confirmed that all 19 districts had established DCC as of December 2019. Various sources (such as an online needs assessment survey for the 2018/19 CBC training) demonstrate that DCCs are in place. SCCs have also been in place in many districts. Table 3-8 shows the establishment status of SCCs at each district according to the questionnaire for CPD advisors. 232 out of 254 (91.3%) sectors based on valid responses had SCCs.

**Table 3-8: Establishment Status of SCCs**

| District | SCCs | # of sectors | Rate | District | SCCs | # of sectors | Rate |
|---|---|---|---|---|---|---|---|
| Nyagatare | 14 | 14 | 100% | Nyabihu | 12 | 12 | 100% |
| Gatsibo | 14 | 14 | 100% | Rubavu | 12 | 12 | 100% |
| Kayonza | No response | 12 | N/A | Ngororero | 13 | 13 | 100% |
| Ngoma | 6 | 14 | 43% | Karongi | 13 | 13 | 100% |
| Kirehe | No response | 12 | N/A | Rutsiro | 13 | 13 | 100% |
| Bugesera | No response | 15 | N/A | Nyamasheke | 15 | 15 | 100% |
| Rwamagana | 14 | 14 | 100% | Rusizi | No response | 18 | N/A |
| Gasabo | No response | 15 | N/A | Nyamagabe | No response | 17 | N/A |
| Kicukiro | No response | 10 | N/A | Nyaruguru | 14 | 14 | 100% |
| Nyarugenge | 10 | 10 | 100% | Huye | 14 | 14 | 100% |
| Gicumbi | No response | 21 | N/A | Gisagara | No response | 13 | N/A |
| Rulindo | No response | 17 | N/A | Nyanza | 10 | 10 | 100% |
| Burera | 17 | 17 | 100% | Ruhango | 9 | 9 | 100% |
| Gakenke | 19 | 19 | 100% | Muhanga | No response | 12 | N/A |
| Musanze | 1 | 15 | 7% | Kamonyi | 12 | 12 | 100% |
| | | | | **Total** | **232** | **416** | **55.8%** |
| | | | | **Valid responses only** | **232** | **254** | **91.3%** |

### (2) Activity 2-2-2: To support DCC in conducting an Open Day to share good CPD practices

The Project supported DCC Gasabo in conducting an Open Day at GS Kabuye Catholique, one of the model schools, on 13th February 2019. The objectives were to increase education stakeholders' understanding about what good lessons look like through demonstration, and to give an opportunity for them to consider their roles in CPD. DCC and SCC representatives from all districts along with parent representatives of the school were invited.

In the preparation phase, JICA experts gave technical advice on specific lesson planning to eleven teachers of math, science and English in primary and lower secondary levels. JICA experts also assisted DCC Gasabo members in planning the agenda and obtaining support from the district.

On Open Day, 118 participants including teachers of the host school and organizers (members of DCC Gasabo, REB staff, SIIQS Project members) participated. Eleven teachers demonstrated lessons in their respective classrooms simultaneously, and DCC Gasabo members played the role of moderators for post-lesson discussion. Through lesson observation and post-lesson discussion, participants better understood the importance of elaborated lesson plans, the learning of individual learners and the careful consideration of group work.

## 3.3.3 Activity 2-3: To develop a SBI implementation manual (including the procedure)

For the Phase II CBC cascade training, the guideline for sector/school-based CPD for CBC was developed. It includes the rationale, planning and implementation of sector-based CPD activities. It was approved by REB in May 2017 and distributed to all districts and sectors. The guideline for sector/school-based CPD is attached in Appendix 10.

For the Phase III CBC cascade training, a SBI implementation manual was included in the audio-visual material as mentioned in 3.2.1. It introduces how to conduct a Lesson Study, showing steps from group formation to reflection on a research lesson.

Furthermore, the Project reviewed the CPD manuals developed by VVOB and School-Based Mentorship Programme (SBMP) respectively to use consistent terminology and to integrate information on Lesson Study.

The Project and DPs involved in the School-Based Mentor (SBM) Task Force jointly conducted a workshop in July 2018 to develop the CPD guidelines, which include good CPD examples in schools. The guidelines were sent to the MINEDUC for endorsement.

### 3.3.4 Activity 2-4: To develop a guideline on observing CBC-based lessons

The guideline was included in the audio-visual material for the Phase III CBC cascade training as mentioned in 3.2.1.

Later, the National Teacher CPD framework (which includes teacher competence standards) was developed through support from UNESCO. It provides criteria for lesson observation and thus, the Project aligned lesson observation activities with this official document.

### 3.3.5 Activity 2-5: To design monitoring forms (including electronic form, simple and user-friendly) by reviewing the existing ones and conducting a rapid survey

The Project assisted in designing both paper-based and online report forms for sector level Phase III CBC training. The paper-based form was distributed to sectors through an education quality campaign conducted in May 2018. 269 sectors responded.

The Project also supported development of a concept note on DCC/SCC monitoring. Based on the concept note, it developed monthly online monitoring forms for DCCs and SCCs to report CPD activities for teachers and DCC/SCC meetings in their respective areas. DCCs and SCCs were required to outline CPD activities in terms of content, date, venue, and objectives, and evaluate the organization of the activities. The forms focused on quantitative aspects, but also covered some qualitative aspects such as good practices and challenges. The Project launched them in April 2019, after piloting in four districts. However, for harmonization of support and sustainability, in June 2019, DPs agreed to develop a common DCC/SCC termly monitoring form. After developing the common tools for DCC/SCC monitoring in collaboration with other DPs, the revised ones were integrated into the REB website by BLF in December 2019. The monitoring forms (in Word form) are attached in Appendix 11.

### 3.3.6 Activity 2-6: To conduct training for REB by JICA Experts to develop the capacity to collect and analyse data, and to develop solutions

#### (1) Activity 2-6-1: To enhance capacity of REB in collecting and analyzing data and to develop solutions through the needs assessment survey of CBC training

The Project contributed to CBC training material development for DDEs/DEOs/SEOs in February 2018 according to the concept note of Phase III CBC training, and trained REB trainers on how to use the materials.

The JICA experts supported REB in data analysis regarding an online needs assessment survey for the 2018/19 CBC training from January to March 2019. The objectives of the online survey were to measure the impact of teacher training on CBC over the three years and evaluate how trained teachers implement CBC. It targeted 6,266 teachers; 1,369 HTs; 30 DDEs/DEOs; and 90 SEOs. Actual participants were 4,179 teachers; 501 HTs; 85 SEOs; and 22 DDEs/DEOs. Collected information was analyzed and compiled into a report.

### 3.3.7 Activity 2-7: To conduct training for REB and National Trainers (including UR-CE) to develop the capacities to evaluate CBC-based lessons by JICA Experts

By using a prototype developed in the material development workshop for the Phase III CBC training, the Project supported the training for NT candidates for six days in November 2017 (as mentioned in 3.2.4(2)). Tutors of the TTC were among them to align pre-service and in-service teacher training. They participated in development of assessment tasks and questions in different subjects to enhance capacities to evaluate CBC-based lessons.

### 3.3.8 Activity 2-8: To conduct training for HT/SEO/DEO to develop the capacities to evaluate CBC-based lessons, to collect and analyze data, and to develop solutions

The Phase II CBC training for SEOs was held in three batches from 9th to 20th May 2017. The training included a SBI (CPD) session and an online monitoring session. The JICA experts supported UNICEF and REB in developing training materials related to SBI (CPD) and online monitoring.

The training included an exercise to get used to the online monitoring system. At the end of the session, SEOs were sent a questionnaire asking when they plan to hold a sector-based orientation of CBC training and training needs among others. The experts compiled the responses and provided guidance to REB for follow-up actions.

The Project also contributed to the Phase III CBC training for DDEs, DEOs and SEOs. It was conducted across three training centers (in three batches) on the 7th to 8th, 12th to 13th and 15th to 16th March 2018. 471 out of 506 (93.1%) education officers were trained. Among the key focus areas of the training were action planning of sector-based training, analysis of learners' performance in the national leaving exam, introduction to online monitoring, and capacity building for problem-solving.

### 3.3.9 Activity 2-9: To conduct monitoring on the situation of CBC and SBI implementation (including email questionnaire survey and technical advice)

#### (1) Activity 2-9-1: To collect quantitative data of CBC and CPD implementation through termly monitoring

The Project first piloted monthly monitoring forms of CBC and CPD implementation in Gicumbi, Kirehe, Rulindo and Rwamagana districts in March 2019 through monitoring forms developed in Activity 2-5. DCCs and SCCs of these districts submitted the forms. As described in 3.3.5, the forms were revised as online DCC/SCC monitoring forms to be commonly used by educational stakeholders, and were integrated into the REB website. The reporting cycle was changed to termly after consultation with education officers.

#### (2) Activity 2-9-2: To collect qualitative data of CBC and CPD implementation through quarterly monitoring

The Project conducted DCC/SCC quarterly monitoring in three districts in the first quarter, ten districts in the second quarter, and six districts in the third quarter of 2019; based on information from monthly monitoring forms/questionnaires etc., in order to collect qualitative data. The Project also conducted quarterly monitoring in the form of a semi-structured interview with target DDEs and SEOs as shown in Table 3-9, who were selected based on information from monthly monitoring forms and other questionnaires. The Project team investigated the qualitative information, that is, the status of DCCs/SCCs and CPD activities, good practices and challenges

in great length. The collected information was compiled into quarterly monitoring reports and submitted to REB as mentioned in 3.3.10.

**Table 3-9: Target DCCs/SCCs in Quarterly Monitoring**

| Quarter | District | Interviewee | Date | Sector | Interviewee | Date |
|---|---|---|---|---|---|---|
| 1st Quarter, 2019 | Kirehe | DDE | 23 Apr 2019 | Mahama | SEO | 23 Apr 2019 |
| | Rulindo | DDE | 23 Apr 2019 | Kisaro | SEO | 23 Apr 2019 |
| | | | | Cyinzuzi | SEO | 24 Apr 2019 |
| | | | | Masoro | SEO | 24 Apr 2019 |
| | Gisagara | DDE | 29 Apr 2019 | Nyanza | SEO | 29 Apr 2019 |
| 2nd Quarter, 2019 | Bugesera | DDE | 26 Aug 2019 | Ruhuha | SEO | 26 Aug 2019 |
| | Rwamagana | DDE | 27 Aug 2019 | Fumbwe | SEO | 27 Aug 2019 |
| | | | | Kigabiro | SEO | 27 Aug 2019 |
| | | | | Musha | SEO | 27 Aug 2019 |
| | Nyabihu | DDE | 27 Aug 2019 | Rurembo | SEO | 27 Aug 2019 |
| | | | | Jenda | SEO | 27 Aug 2019 |
| | | | | Rambura | SEO | 29 Aug 2019 |
| | Gisagara | DDE | 28 Aug 2019 | Ndora | SEO | 28 Aug 2019 |
| | Rubavu | — | — | Kanama | SEO | 28 Aug 2019 |
| | Muhanga | DEO | 29 Aug 2019 | Kibangu | SEO | 29 Aug 2019 |
| | Musanze | — | — | Shingiro | SEO | 29 Aug 2019 |
| | | | | Remera | SEO | 29 Aug 2019 |
| | Rulindo | — | — | Kisaro | SEO | 30 Aug 2019 |
| | | | | Bushoki | SEO | 30 Aug 2019 |
| | Kayonza | DDE | 3 Sep 2019 | Mukaranage | SEO | 3 Sep 2019 |
| | Gasabo | — | — | Gatsata | SEO | 4 Sep 2019 |
| | Karongi | DDE | 6 Sep 2019 | Rubengera | SEO | 6 Sep 2019 |
| 3rd Quarter, 2019 | Rubavu | — | — | Mudende | SEO | 21 Oct 2019 |
| | | | | Bugeshi | SEO | 22 Oct 2019 |
| | | | | Nyamyumba | SEO | 24 Oct 2019 |
| | Rutsiro | — | — | Gihango | SEO | 23 Oct 2019 |
| | | | | Mushonyi | SEO | 24 Oct 2019 |
| | | | | Ruhango | SEO | 24 Oct 2019 |
| | | | | Nyabirasi | SEO | 25 Oct 2019 |
| | Ruhango | DDE | 11 Dec 2019 | Byimana | SEO | 29 Oct 2019 |
| | | | | Kabagali | SEO | 30 Oct 2019 |
| | Ngororero | — | — | Kabaya | SEO | 28 Oct 2019 |
| | | | | Gatumba | SEO | 30 Oct 2019 |
| | Huye | DDE | 11 Dec 2019 | — | — | — |
| | Kamonyi | DDE | 11 Dec 2019 | — | — | — |

Note: DDEs of Rubavu, Musanze, Rulindo, Gasabo were not available during the 2nd quarter monitoring.
DDEs of Rubavu, Rutsiro, and Ngororero were not available during the 3rd quarter monitoring.

### 3.3.10 Activity 2-10: To develop materials to address challenges identified in the reports submitted to REB

#### (1) Activity 2-10-1: To elaborate on analysis reports of monitoring (including good CPD practices)

The monitoring data that was collected in Activity 2-9 was compiled and analyzed as monitoring reports that include optimal CPD practices and challenges, as well as the status of DCCs/SCCs. The reports were submitted to REB and shared with DCCs and SCCs to disseminate good practices. The monitoring reports for the first quarter, the second quarter and the third quarter are attached in Appendix 12 to Appendix 14.

Based on the monitoring of CBC and CPD, the Project developed a Lesson Study practical guide to provide practical guidelines with teachers for developing a good lesson as intended in CBC (Figure 3-2). The guide provides typical misunderstandings about CBC, techniques to improve lessons, examples of improvement, etc., taken from the Lesson Study and the sharing workshop

with model school teachers. The guide was distributed to participants of the Project closing seminar held in November 2019. Representative SEOs received the copies of the guide for all sectors of their own districts and were requested to distribute them. The Lesson Study practical guide is attached in Appendix 15.

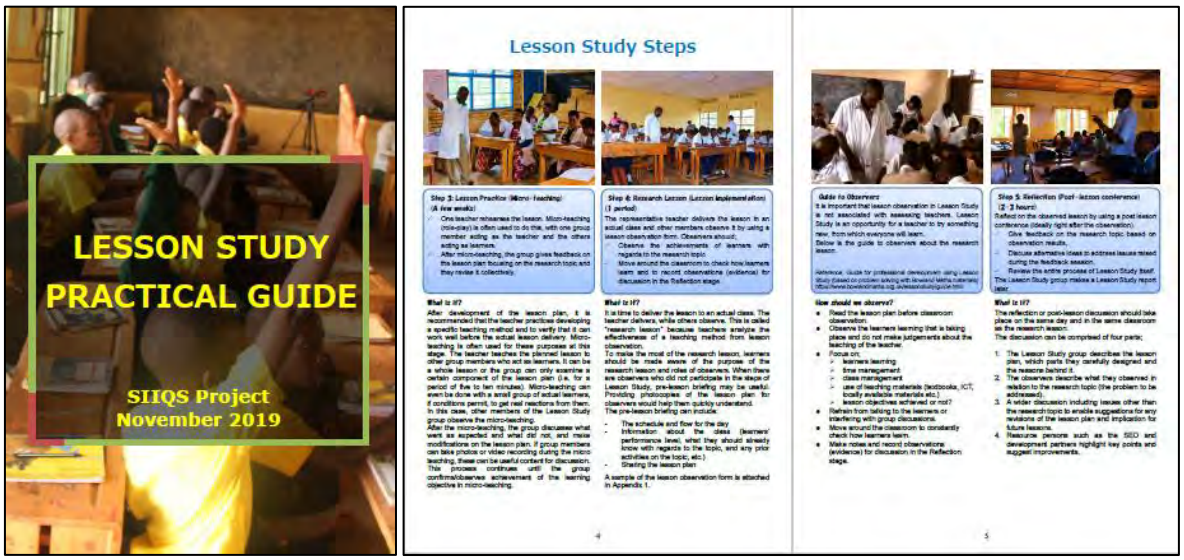



**Figure 3-2: Image of Lesson Study Guide**

In addition, the Project developed video samples of model lessons to share with Rwandan schools. Three research lessons at model schools (P5 math lesson of EP Buhande, P5 SET lesson of GS Mukarange Catholique, S2 math lesson of GS APAGIE Musha) were videotaped and uploaded to the REB's e-learning platform.

### 3.3.11 Activity 2-11: To conduct a training based on the materials developed above for REB and National Trainers

#### (1) Activity 2-11-1: To conduct a national DCC/SCC forum to enhance the monitoring mechanism

The National DCC Forum as a part of the Project closing seminar was conducted on 28th November 2019. The objectives were to report achievement of the Project, share good practices of Lesson Study and DCC/SCC activities, lessons learned from the ELS and discuss ways forward. A total of 157 representatives from districts, sectors and schools, as well as DPs participated.

Regarding good practices of Lesson Study, four representatives from model schools presented their experience and the impact of Lesson Study on teaching and learning. As for good practices of DCCs/SCCs, one DCC representative and one SCC representative presented how they have addressed challenges.

## 3.4 Activity 0-2: Endline Survey

The Endline Survey (ELS) was conducted from June to September 2019. The objectives were to objectively evaluate the changes in and impact of the Project activities on teaching and learning in CBC, focusing on Lesson Study at model schools and support for implementation of CPD. The Project devised an experimental design of the treatment for the six model schools ("Treatment group"). It compared evaluation of lesson videos, lesson plans and questionnaire/interview responses from head teachers and teachers, and results of AATs for learners between the treatment group and control group (five schools with no treatment). The schools in the control group were

selected from those with similar attributes to the model schools at the baseline analysis. The DCCs and SCCs which supervise these schools were also visited for interviews. The sample size of lesson videos, lesson plans and AATs, along with the sample size of questionnaire and interview at schools, and sample size of interview with DCCs and SCCs are shown in Table 3-10, Table 3-11 and Table 3-12 respectively. The ELS results were compiled in the Endline Survey Report (Appendix 16).

**Table 3-10: Sample Size of Lesson Videos, Lesson Plans and AATs in ELS**

| Group | School | School Type | Survey item | Primary | | Lower Secondary | | Upper Secondary | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Math | SET | Math | Science | Math | Science |
| Treatment | EP Buhande | Primary | Video/LP | P5 | P5 | | | | |
| | | | AAT | 36 | 40 | | | | |
| | GS Kabuye Catholique | 9YBE | Video/LP | P5 | P5 | N/A* | S2(bio) | | |
| | | | AAT | 128 | 137 | 41 | 25 | | |
| | GS Mukarange | 12YBE | Video/LP | P5 | P5 | S2 | S2(bio) | S5 | S2(phy) |
| | | | AAT | 39 | 42 | 45 | 45 | 57 | 14 |
| | GS St Aloys Rwamagana | Secondary | Video/LP | | | S2 | S3(bio) | S4 | S4(chm) |
| | | | AAT | | | 56 | 69 | 100 | 64 |
| | GS APAGIE Musha | Secondary | Video/LP | | | S2 | S2(bio) | S5 | S4(chm) |
| | | | AAT | | | 47 | 48 | 54 | 37 |
| | GS Notre Dame des Apôtres Rwaza | Secondary (girls) | Video/LP | | | S2 | S2(bio) | S4 | S4(chm) |
| | | | AAT | | | 35 | 38 | 39 | 77 |
| Control | EP Bukinanyana ADEPR | Primary | Video/LP | P5 | P5 | | | | |
| | | | AAT | 61 | 69 | | | | |
| | GS Bubazi | 9YBE | Video/LP | P5 | P5 | S2 | S2(chm) | | |
| | | | AAT | 48 | 44 | 45 | 48 | | |
| | GS Gihogwe Catholique | 12YBE | Video/LP | P5 | P5 | S2 | S2(bio) | N/A ** | N/A ** |
| | | | AAT | 137 | 140 | 78 | 73 | N/A ** | N/A ** |
| | GS Rambura Garçon*** | Secondary | Video/LP | | | S2 | S2(bio) | S5 | S4(chm) |
| | | | AAT | | | 43 | 44 | 87 | 34 |
| | Lycée Notre Dame de la Visitation**** | Secondary (girls) | Video/LP | | | S2 | S2(bio) | S5 | S4(phy) |
| | | | AAT | | | 22 | 21 | 19 | 20 |
| Total | # of Lesson Recorded | | | 6 | 6 | 8 | 9 | 6 | 6 |
| | # of Lesson Plans Collected | | | 6 | 6 | 6 | 9 | 5 | 5 |
| | # of Participants in AAT | | | 449 | 472 | 412 | 411 | 356 | 246 |

Note. bio: biology, chm: chemistry, phy: physics

* Lower secondary mathematics lesson at GS Kabuye Catholique could not be observed because of the timetable.

** GS Gihogwe Catholique was a 12YBE, but it does not have mathematics and science subjects in upper secondary level. Therefore, no lessons were observed and no AATs were administered in the upper secondary level.

*** The lesson plans in S2 math, S5 math and S4 chemistry at GS Rambura Garçon were not collected.

**** The lesson plan in S2 math at Lycée Notre Dame de la Visitation had not been prepared.

**Table 3-11: Sample Size of Questionnaire and Interview at Schools in ELS**

| School Name | Questionnaire (Teachers) | Focus Group Interview (Teachers) | Questionnaire & Interview (HTs) |
|---|---|---|---|
| EP Buhande | 9 | 9 | 1 |
| GS Kabuye Catholique | 12 | 13 | 1 |
| GS Mukarange Catholique | 14 | 11 | 1 |
| GS APAGIE Musha | 8 | 9 | 1 |
| GS St Aloys Rwamagana | 8 | 8 | 1 |
| GS Notre Dame des Apôtres Rwaza | 4 | 3 | 1 |
| EP Bukinanyana ADEPR | 5 | 6 | 1 |
| GS Gihogwe Catholique | 16 | 12 | 1 |
| GS Bubazi | 6 | 5 | 1 |
| Lycée Notre Dame de la Visitation | 5 | 4 | 1 |
| GS Rambura Garçon | 14 | 14 | 1 |
| Total | 101 | 94 | 11 |

**Table 3-12: Sample Size of Interview with DCCs and SCCs in ELS**

| DCC | Interview (DDE) | SCC | Interview (SEO) |
|---|---|---|---|
| Rwamagana | 1 | Musha | 1 |
| | | Kigabiro | 1 |
| Gasabo | - | Gatsata | 1 |
| Nyabihu | 1 | Jenda | 1 |
| | | Rambura | 1 |
| Musanze | - | Remera | 1 |
| Rulindo | - | Bushoki | 1 |
| Kayonza | 1 | Mukarange | 1 |
| Karongi | 1 | Rubengera | 1 |
| Total | 4 | Total | 9 |

Interviews with DDEs Gasabo, Musanze and Rulindo, and an interview with SEO Jabana were not conducted because of urgent business.

## 3.5 Project Management

### 3.5.1 Joint Coordination Committee

The Project held JCC five times; in March 2017, October 2017, March 2018, January 2019, and July 2019. Progress of the Project and achievement of Outputs were among the major items in the agendas. Table 3-13 shows the outline of JCCs conducted and the minutes are attached in Appendix 17 to 21.

**Table 3-13: Outline of JCCs**

| # | Date | Venue | Main Agendas |
|---|---|---|---|
| 1 | 23 Mar 2017 | TDM Board Room, REB | - Project brief<br>- Project management mechanism<br>- Preliminary findings from BLS |
| 2 | 31 Oct 2017 | TDM Board Room, REB | - Progress of Output 1 and 2<br>- Problems and issues in project management |
| 3 | 14 Mar 2018 | TDM Board Room, REB | - Progress of Output 1 and 2<br>- M&E of the Project |
| 4 | 23 Jan 2019 | TDM Board Room, REB | - Progress of Output 1 and 2<br>- Annual activity plan |
| 5 | 23 Jul 2019 | Board Room, REB Main Office | - Revision of PDM, Progress of Output 1 and 2<br>- Preliminary findings from ELS<br>- Upcoming activities |

### 3.5.2 DP Coordination

To share information with other DPs, the Project regularly participated in the DP coordination platform related to teacher professional development such as the Teacher Professional Development Technical Working Group (TPD-TWG), SBMP Task Force, and Rwanda Education NGO Coordination Platform (RENCP) (See Table 3-14).

**Table 3-14: DP Coordination Platform**

| Platform | Main Activities | Frequency |
|---|---|---|
| Teacher Professional Development Technical Working Group (TPD-TWG) | TPD-TWG is under the Basic Education Strategy Group and DPs (which are active in pre-service and in-service teacher training) are the members. Chaired by the Head of TDM&CGC department and co-chaired by United States Agency for International Development (USAID). | Every month |

| Platform | Main Activities | Frequency |
|---|---|---|
| School-Based Mentorship Programme (SBMP) Task Force | Stakeholders in SBMP meet and discuss the issues and plans related to SBMs. Chaired by the Head of TDM&CGC department and co-chaired by UNICEF. | Bimonthly |
| Rwanda Education NGO Coordination Platform (RENCP) | A coordination platform for NGOs which are active in the education sector. PADECO is among the affiliate members as a private company. | Quarterly |
| RENCP Teacher Development and Education Leadership Working Group (TDEL) | A working group under RENCP. Members are Non-Governmental Organizations (NGOs) which are active in teacher professional development. PADECO is among the affiliate members as a private company. | Occasionally |

Other DPs were involved individually as listed in Table 3-15. Furthermore, the Project contributed to the development of official documents below in collaboration with REB and other DPs.

**Table 3-15: Major Collaboration with Other DPs**

| DP | Overview of the Project contribution |
|---|---|
| BLF | The Project conducted DCC/SCC orientation and workshop, and developed DCC/SCC monitoring forms collaboratively as discussed in 3.3.2(1) and 3.3.5. |
| Education Development Center Inc. (EDC) | The Project exchanged opinions with EDC staff and participants of the EDC seminar about how to disseminate and strengthen CPD in upper secondary schools and TVET during the workshop of Akazi Kanoze 2 programme in September 2017. |
| Kuder | The Project was invited to the "Rwanda Summit on national Career Guidance and other Education Innovations" held on 26th October 2017 as one of the presenters. It presented the Project activities to more than 500 participants. |
| VVOB | As mentioned in 3.3.2(2), the Project collaborated in conducting the National DCC Forum.<br>It also provided training content on a Lesson Study for a CPD certificate course on Educational Mentorship and Coaching for SBMs and SEOs, upon requests. |
| UNICEF | The Project developed the Phase III CBC training materials and conducted NT training together. It also collaborated in developing school-based CPD manuals through SBMP by providing content on Lesson Study. |

#### (1) Education Sector Strategic Plan 2018/19-2023/24

The JICA experts proposed modifications to the draft Education Sector Strategic Plan (ESSP) 2018/19-2023/24 which was shared with DPs, and consequently its final draft included CPD as one of the priorities and mentioned DCC as a platform to strengthen CPD.

#### (2) National Teacher CPD Framework

The Project continuously discussed the draft National Teacher CPD Framework with UNESCO, which supported its development, as well as other relevant DPs.

Since "Curriculum Framework for Teacher Training College" was coincidentally drafted at the same time by the University of Rwanda College of Education (UR-CE), the Project, UNICEF and VVOB proposed revisions to "Teacher Competences" in the National Teacher CPD Framework so as to fit with other policy documents and in the Rwandan context. The proposed revision was adopted and the National Teacher CPD Framework was finalized later.

### 3.5.3 Presentation at International Conferences

The SIIQS team presented findings from the Project at several international academic conferences in the field of education, namely; the International Council on Education for Teaching (ICET), Distance Education and Teacher Education in Africa (DETA) Conference, World Association of Lesson Studies (WALS), and the Comparative and International Education Society (CIES). The

details of the presentations for these conferences are shown in Table 3-16 and presentation materials are attached in Appendix 22 to 28.

**Table 3-16: Outline of the Presentations in Academic Conferences**

| Conference | Presentation Title and Authors | Venue | Date |
|---|---|---|---|
| ICET 2017 | Title: Bridging the Gap between Policy and Practice: The Case of Competency-Based Curriculum in Rwanda<br>Authors: Kyoko Yoshikawa, Antoine Mutsinzi, Yumiko Ono, Ryuichi Sugiyama, Sayaka Matsuzuki | Masaryk University, Czech Republic | 29 Jun 2017 |
| DETA 2017 | Title: Exploratory Analysis on Motivational Factors Influencing Teachers' Participation to School-Based In-service Teacher Training (SBI) Programme in Rwanda<br>Authors: Claudien Nzitabakuze, Antoine Mutsinzi, Ruth Mukakimenyi, Ryuichi Sugiyama, Kyoko Yoshikawa, Sayaka Matsuzuki, Yumiko Ono | University of Rwanda, College of Education | 24 Aug 2017 |
| WALS 2017 | Title: Theory into Practice: Developing Model Lessons Based on New CBC Curriculum through Lesson Study in Rwanda<br>Authors: Antoine Mutsinzi, Kana Yamashita, Yumiko Ono, Tateo Abe, Keiichi Naganuma, Kenji Ohara, Sayaka Matsuzuki, Ryuichi Sugiyama | Nagoya University, Japan | 25 Nov 2017 |
| WALS 2018 | Title: Improvement of Teachers' Questioning Skills in Mathematics and Students' Higher Order Thinking Skills through Lesson Study in Rwanda<br>Authors: Kenji Ohara, Ryuichi Sugiyama, Sayaka Matsuzuki, Yumiko Ono, Tateo Abe | Beijing Normal University, China | 25 Nov 2018 |
| CIES 2019 | Title: Decentralizing and Contextualizing Teacher Continuous Professional Development in Rwanda - Increasing Effectiveness of CPD for Equitable Learning<br>Authors: Kyoko Yoshikawa Iwasaki, Ryuichi Sugiyama, Yumiko Ono, Sayaka Matsuzuki, Kenji Ohara | Hyatt Regency San Francisco hotel, United States | 16 Apr 2019 |
| ICET 2019 | Title: Strengthening Teachers' Questioning Skills in Mathematics and Students' Higher Order Thinking Skills through Lesson Study in Rwanda<br>Authors: Yumiko Ono, Antoine Mutsinzi, Sayaka Matsuzuki | University of Johannesburg, South Africa | 6 Jul 2019 |
| WALS 2019 | Title: A Case Study of Teacher Learning and Teacher Change through Lesson Study as School-Based CPD<br>Authors: Yumiko Ono, Sayaka Matsuzuki, Ryuichi Sugiyama, Antoine Mutsinzi, Kizito Ndihokubwayo, Hashituky Telesphore Habiyaremye | The Johan Cruijff ArenA, Amsterdam, Netherland | 4 Sep 2019 |

# 4. Achievement of the Project

## 4.1.1 Achievement of the Indicators Defined in the PDM

Indicators to assess the achievement of the Project are defined in the official agreement called the Project Design Matrix (PDM). Some indicators require comparative analysis between the model schools and control schools which had similar attributes at the beginning of the Project to objectively verify the achievements. To do that, the Project conducted the Endline Survey (ELS) in June to September 2019. The Endline Survey Report (Appendix 16) describes the details and this chapter highlights the overall picture of achievements according to the indicators.

### (1) Overall Goal[5]; Students' learning process in classroom is improved.

In summary, the Project adequately improved the student's learning process. Students in model schools gave more open-ended responses and their academic achievements were better than those of the control schools. The data and rationale for each indictor are summarized below.

***Indicator 1: More students in a model school than those in a control school present relevant response to an open question posed by a teacher.***

**Rationale of Achievements:** The ELS confirmed the desired trend that more open-ended responses[6] were made by students in model schools than in control schools (except for mathematics in the primary level) as shown in Table 4-1. Thus, the Project has had a positive impact to prompt the behavioral changes of student learning in model schools. It should be resulted by the learner-centered lesson described later.

**Table 4-1: Frequency of Open-ended Responses by Students (Average)**

| Level | Subject | Model Schools | | Control Schools | |
|---|---|---|---|---|---|
| | | *n* | Frequency (%) | *n* | Frequency (%) |
| Primary | Math | 3 | 11.1 | 3 | 16.3 |
| | Science | 3 | 14.3 | 3 | 9.1 |
| Lower secondary | Math | 4 | 20.6 | 4 | 15.5 |
| | Science | 5 | 20.6 | 4 | 15.5 |
| Upper secondary | Math | 4 | 54.7 | 2 | 34.2 |
| | Science | 4 | 28.5 | 2 | 10.4 |

*n*: Number of lessons observed.
Higher values are indicated in grey in comparison of Model schools and Control schools.

***Indicator 2: Result of the academic achievement test developed by the Project improves more in model schools compared to control schools.***

**Rationale of Achievements:** The ELS confirmed that the average scores of the Academic Achievement Tests (AATs) of the model schools were higher than those of the control schools with a statistically significant difference (except for science at the lower secondary level of secondary schools) as shown in Table 4-2. Like indicator 1, it implies that the Project has contributed to improve the academic achievement of students in model schools.

[5] Overall goal defines an impact level which is expected to be achieved in a couple of years after project completion.
[6] Although the indicator offers to argue frequency of responses against the open questions posed by teachers, we noticed that the relevant open-ended replies were given even with closed questions, rephrases or confirmations. Therefore, we reviewed open-ended responses regardless of the teacher's questioning/direction type.

**Table 4-2: Comparison of AAT Results by Intervention and School Level**

| Subject | Level | # of Qns | Model Schools | | | Control Schools | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | *n* | *Ave.* | *SD* | *n* | *Ave.* | *SD* | |
| Math | Primary | 33 | 203 | 14.8 | 4.5 | 246 | 13.1 | 4.1 | ** |
| | Lower Secondary (SS) | 40 | 138 | 24.4 | 6.3 | 65 | 19.6 | 5.5 | ** |
| | Lower Secondary (9/12) | 40 | 86 | 15.5 | 4.8 | 123 | 13.5 | 4.4 | ** |
| | Upper Secondary (SS) | 40 | 193 | 24.9 | 6.1 | 106 | 20.3 | 5.8 | ** |
| Science | Primary | 13 | 219 | 7.4 | 2.4 | 253 | 6.0 | 2.5 | ** |
| | Lower Secondary (SS) | 24 | 155 | 12.6 | 3.4 | 65 | 12.5 | 3.0 | |
| | Lower Secondary (9/12) | 24 | 70 | 8.7 | 2.8 | 121 | 7.7 | 2.3 | * |
| | Upper Secondary (SS) | 40 | 178 | 19.6 | 4.6 | 54 | 17.1 | 5.0 | ** |

**$p<.01$, *$p<.05$
SS: Secondary School. 9/12: 9/12YBE
Each question is worth one mark. Higher scores are indicated in grey in comparison of model and control schools

## (2) Project Purpose; Implementation of CBC-based lesson in the classroom is strengthened through SBI activities.

The Project strengthened CBC-based lessons in model schools through Lesson Study, an advanced form of SBI (CPD), so that teachers in model schools are now more capable to develop detailed lesson plans and to give effective questioning to conduct learner-centered lesson. The data and rationale for each indicator are summarized below.

***Indicator 1: Lesson plans developed by teachers in model schools include all elements specified in Competence 2.1 of the National Teacher CPD Framework.***

**Rationale of Achievements:** The ELS confirmed that the lesson plans developed by teachers in model schools included more elements that the Competence 2.1 of the National Teacher CPD Framework specified as necessary than in control schools. The ELS elaborated evaluation criteria based on it and prepared the rubrics on a four-level scale as shown in Table 4-3.

**Table 4-3: Rubric for Lesson Plan Evaluation**

| Criteria | | No description | Poor | Fair | Good |
|---|---|---|---|---|---|
| 1. Clear and measurable outcomes and objectives and activities to achieve them. | 1-1. Clear and measurable outcomes and objectives | 0 | 1 | 2 | 3 |
| | 1-2. Attainableness of Activities | 0 | 1 | 2 | 3 |
| 2. Learning outcomes and objectives support learners to move from simple and familiar to more complex and sophisticated knowledge and skills | | 0 | 1 | 2 | 3 |
| 3. Regular revision of learning and learning assessments. | | 0 | 1 | 2 | 3 |
| 4. Adaptions for specific learners. | | 0 | 1 | 2 | 3 |
| 5. Use a range of TLRs, vary interaction patterns | | 0 | 1 | 2 | 3 |

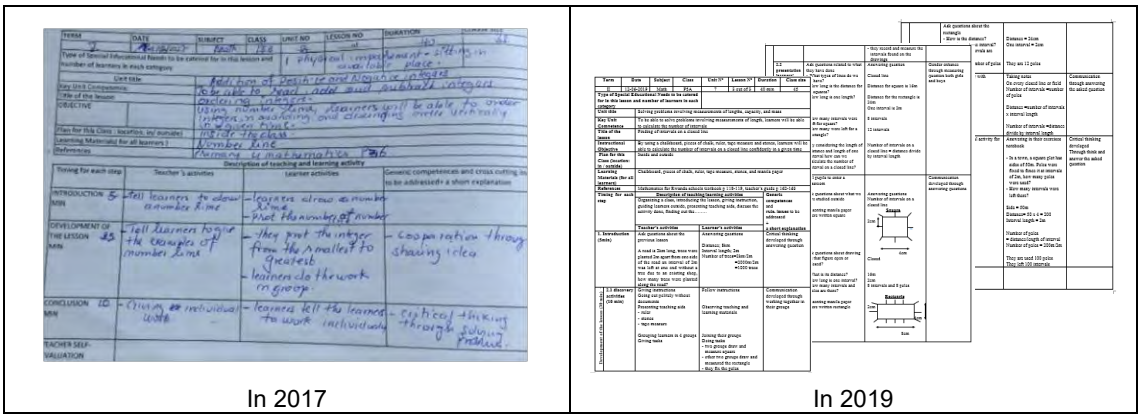
The evaluation scores in comparison between the model schools and control schools are shown in Table 4-4. Although the average scores for criteria 2 and 4 are still comparatively low even in the model schools, the overall scores in the model schools are relatively better than those in the control schools.

**Table 4-4: Evaluation Score Lesson Plan (Average)**

| Type | Subject | *n* | 1-1 | 1-2 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| Model Schools | Math | 11 | 3.0 | 2.3 | 0.0 | 1.8 | 0.6 | 2.0 |
| | Science | 12 | 3.0 | 2.3 | 0.8 | 1.3 | 0.3 | 2.0 |
| Control Schools | Math | 5 | 3.0 | 2.4 | 0.0 | 0.6 | 0.4 | 2.0 |
| | Science | 8 | 2.5 | 2.1 | 0.0 | 0.6 | 0.6 | 1.5 |

The visual observation also supports the general positive trends found in the evaluation. Figure 4-1 shows the change of the lesson plan of the same teacher in a certain model school. We can immediately understand that the recent lesson plan contains various detailed information and is a significant improvement compared to the one developed in 2017 at a glance. We can conclude that the Project improved the lesson plans according to the elements in the description of Competence 2.1 in the National Teacher CPD framework.

***Indicator 2: Teachers give more open questions in model schools compared to control schools.***



In 2017 In 2019

**Figure 4-1: Change of Lesson Plan in Model School**

**Rationale of Achievements:** The ELS confirmed the positive trend that teachers in model schools used more open questions than in control schools (except for science in the upper secondary level) as shown in Table 4-5. It shows the average frequency of open questions made by teachers at each school level and subject.

**Table 4-5: Frequency of Open Questions by Teachers (Average)**

| Level | Subject | Model Schools | | Control Schools | |
|---|---|---|---|---|---|
| | | *n* | Frequency (%) | *n* | Frequency (%) |
| Primary | Math | 3 | 1.0 | 3 | 0.5 |
| | Science | 3 | 9.3 | 3 | 4.5 |
| Lower secondary | Math | 4 | 2.2 | 4 | 0.2 |
| | Science | 5 | 6.3 | 4 | 5.5 |
| Upper secondary | Math | 4 | 2.2 | 2 | 1.3 |
| | Science | 4 | 5.2 | 2 | 10.0 |

*n*: Number of lessons observed.
Higher values are indicated in grey in comparison of model and control schools.

The ELS also confirmed that teachers in the model schools tend to teach **indirectly**, particularly in mathematics. All teacher's talks in the observed lessons during the ELS were classified into typical teaching techniques such as "open question", "closed question", "explanation", "justification" and so on. Some teaching techniques are directive which puts learners in a passive mode. Conversely, some other techniques such as "open question" and "rephrase student" prompt learners to think actively. We named it "indirect teaching". Table 4-6 shows the average rate of indirect teaching by school level and subject. Flanders (1965)[7] found that academic achievements of students who were subject to indirectly teaching were better than those taught directly. This difference may be a leading factor to the higher academic achievements in model schools described above.

[7] Flanders, N. A. (1965). Teacher influence, pupil attitudes and achievement. Washington, DC: United States. Dept. of Health, Education and Welfare.

**Table 4-6: Rate of Indirect Teaching by Teachers (Average)**

| Level | Subject | Model Schools | | Control Schools | |
|---|---|---|---|---|---|
| | | ***n*** | **Rate (%)** | ***n*** | **Rate (%)** |
| Primary | Math | 3 | 88.4 | 3 | 73.3 |
| | Science | 3 | 82.4 | 3 | 85.3 |
| Lower secondary | Math | 4 | 77.5 | 4 | 67.8 |
| | Science | 5 | 71.1 | 4 | 78.8 |
| Upper secondary | Math | 4 | 80.6 | 2 | 60.3 |
| | Science | 4 | 67.7 | 2 | 64.1 |

*n*: Number of lessons observed.
Higher values are indicated in grey in comparison of model and control schools.

### (3) Output 1; Teachers' understanding of CBC-based lesson implementation is enhanced.

***Indicator 1: Post-test results of participants in trainings and workshops including an e-learning course exceed 70%.***

**Rationale of Achievements:** The several post-tests confirmed that teachers understand about CBC lesson implementation well. The Project directly supported trainings for National Trainers (NTs) and Sector-Based Trainers (SBTs) in the Phase III CBC training from the end of 2017 to the beginning of 2018 (See section 3.2.4). The average scores of the post-tests for the NTs and SBTs were 73.7% and 74.0% respectively. Besides this, the Project conducted an online assessment to review the teachers' understanding on CBC training in November 2018 (See section 3.2.4(4)). The online test covered the entire training contents from CBC training Phase I to III and the average score was 82.9%.

***Indicator 2: Self-evaluation of teachers' understanding of CBC-based lessons continues to be 90% or above.***

**Rationale of Achievements:** Teachers in Rwandan schools have had a good understanding of CBC lessons. In the Baseline Survey (BLS), more than 90% of teachers were confident in delivering CBC-based lessons and developing learners' competences. Moreover, more than 90% of SBTs thought they were competent as trainers in the Phase III CBC training. The trend continued and by now 97.9% of teachers either strongly agreed or agreed with the answer "I understand the philosophy of CBC" in self-evaluations of the ELS.

### (4) Output 2; Problem-solving capacities are enhanced at school, sector, district, and national level.

***Indicator 1: All sectors implement sector-based CBC training.***

**Rationale of Achievements:** It was partially achieved because the Project couldn't confirm the execution of sector-based CBC training in all sectors. As of June 2018, half a year after the SBT training for the Phase III CBC training, 312 sectors reported the sector-based CBC training implementation status and 86% (269 sectors) of them successfully organized it.

***Indicator 2: More than one good practice of school-based CPD is reported quarterly from all DCCs that have been established.***

**Rationale of Achievements:** The good practices of school-based CPD have been regularly reported. The Project started the quarterly monitoring in the first quarter of 2019, since then the Project has confirmed good practices were being carried out in all districts visited. DCCs and

SCCs often raised the transportation allowance issue as an obstacle for CPD implementation, but some DCCs and SCCs guided schools to use school capitation grant to invite guests and visit other schools to observe each other's CPD. Thus, the schools have started solving major problems related to CPD by themselves. This good practice was shared in the closing seminar of the Project.

Policies to consolidate and sustain the CPD reporting system were maintained as well. For instance, in July 2019, REB requested to include activities related to CPD in the performance contract at the district level. The request is under discussion at the Ministry of Local Government (MINALOC) as of December 2019. In addition, the Project supported the development of the National Teacher CPD Framework to define the competence of teachers, as well as to strengthen the CPD monitoring and reporting mechanism throughout the country. The concept of the "Problem Solving Cycle" of CPD proposed by the Project has been introduced in the framework as the "Model for Teacher CPD in Rwanda" which enables efficient monitoring and reporting among CPD stakeholders to immediately share the good CPD practices across the country. It has been approved recently.

***Indicator 3: The rate of teachers' participation in school-based CPD increases from 75% (baseline) to 90%.***

**Rationale of Achievements:** The ELS confirmed the high participation in school-based CPD. Additionally, we can assume the high participation will continue in the future. The Project regularly reviewed the participation rate of teachers in school-based CPD. As of the BLS, all schools surveyed organized school-based CPD and 75% of teachers attended. The joint online survey conducted together with REB and the British Council in March 2019 confirmed 81% out of 4,178 teachers attended school-based CPD, more than once a term in 2018.

In the ELS, the CPD participation rate reached 98%. It implies that the nationwide promotion of CPD successfully engaged teachers in CPD regardless of the intervention by DPs. One of the reasons of the high percentage may be because of the support for DCC and SCC establishment. As a result, now CPD is recognized as an obligation of teachers. REB began preparing mandatory CPD courses which will be effective from FY2021. Other policies and guidelines also support maintaining CPD in schools (e.g. setting CPD time in timetable). Therefore, we can optimistically expect that teachers will continue CPD in the future.

***Indicator 4: More than 50% of DCCs and SCCs submit monitoring reports using a developed form on monthly basis.***

**Rationale of Achievements:** The new CPD reporting system was integrated into the REB website by BLF. We can assume a high submission rate of CPD reports from DCC and SCC throughout the country. CPD is a part of the national agenda now, and REB and DPs have been discussing on a comprehensive national CPD reporting system to cover various CPD activities conducted by different initiatives. Particularly, BLF and the Project have jointly been developing the online CPD reporting system. During the system design and development, CPD advisors dispatched by IEE for each district have provided technical assistance to DCC to submit paper-based reports. Consequently, 16 DCCs out of 30 (53.3%) submitted reports to REB through CPD advisors in September 2019. In addition, BLF and the Project have collaborated in DCC workshops since October 2019 to give guidance about the online reporting system. As for SCCs, the Project gave CPD advisors a questionnaire to understand the situation objectively. From 19 valid responses (19 CPD advisors), we found that 145 SCCs out of 254 (57.1%) have regularly reported their CPD activities to the DCCs in a paper-form. In most districts which had established a reporting system between DCC and SCCs, the submission rate from SCCs was 100%. Therefore, DCCs and SCCs are ready to shift from the paper-based report to an online one which may increase the submission rate to more than 50% as defined by the indicator.

# 5. Lessons Learned and Remaining Issues

## 5.1 Lessons Learned

### 5.1.1 Lesson Improvement

#### (1) Lesson Study Improves Learning and Teaching

The ELS reviewed the lessons in the model schools in comparison with those in the control group. The analysis revealed that teachers' understanding of CBC in model schools was higher and lesson plans had improved much more than in the control schools. Teachers in the model schools improved facilitation skills and applied "indirect teaching", the ideal pedagogy in CBC. Learners in the model schools were more likely to enjoy more opportunities to interact with each other and construct knowledge by themselves than in the control schools. The overall results of academic achievement test in the model schools was significantly higher than in the control schools and implied that higher order thinking had especially improved (see "Endline Survey Report" for more details). These findings suggest that teachers' proficiency in CBC can improve by continuing Lesson Study, which can lead to improvements in academic performance and the development of higher order thinking skills.

#### (2) Lesson Study Changes Teacher's Attitude

The ELS also found the interesting trend that teachers involved in Lesson Study assessed their school circumstances positively. For instance, teachers in model schools felt the schools they were working at had good school management and collegiality, indicating that they were engaged in school duties. In fact, although CPD had been implemented in all schools in some form, teachers who participated in Lesson Study regularly had more positive views towards school circumstances than those in other schools. This implies that Lesson Study develops the professional attitude of teachers in a way that they take responsibility not only for lesson improvement, but also for school duties. Eventually, Lesson Study improved overall school management. The reason behind this change can be linked to "confidence", because most teachers in model schools say that a benefit of Lesson Study is that they felt more confident to teach than before due to the hands-on support. The confidence here may have resulted in generating positive attitudes and increased satisfaction.

#### (3) Visible Evidence Encourages Participation in Lesson Study

"Lesson study is not just another activity that teachers must add to the list of expectations"[8]. Lesson Study is organized along with regular teaching processes such as lesson planning, preparation, implementation and reflection. Lesson Study was incorporated into the school timetables of the model schools as their duty. In other words, we have not paid any allowance. At first, teachers were discouraged with our policy (no allowance), some HTs were struggling to engage teachers in Lesson Study. However, once we shared the greatly improved lesson plans after Lesson Study, teachers understood the impact and came on their own will to attend Lesson Study.

### 5.1.2 CPD Promotion

According to our pilot and observation, Rulindo district made significant progress on DCC and SCC implementation. The box below shows some of the key points on how CPD is being active in Rulindo district. Some important lessons can be extracted from them.

[8] Stigler J. W. & Hiebert J. (1999, p.152) "The Teaching Gap: Best Ideas from the World's Teachers for Improving Education in the Classroom", New York Free Press.

**BOX: Good Practices of CPD in Rulindo District**

Evidence of active CPD implementation are;

- District allocate budget for DCC and SCC
- CPD action plan has been developed and revised
- CPD action plan include Lesson Study
- All schools develop CPD reports when they conduct CPD activities
- SCCs and DCC communicate by using a monthly report form that the Project prepared
- SCCs coordinate inter-school CPD to share good practices
  - ✓ The transportation cost for inter-school CPD is covered by school capitation grant

#### (1) Leaders Awareness on CPD Generates Dynamism of DCC and SCCs

The most remarkable point among the above is that Rulindo budgeted DCC and SCC activity costs. It was achieved, of course, because of the good awareness and leadership of the mayor and executive secretaries in each sector. We observed lots of good practices in different districts and sectors, however, most of them came from individual efforts without being monitored by supervisors. In that case, it is difficult to expand the good practices across the district. On the contrary, CPD in Rulindo is supervised and harmonized by leaders. It consequently boosts the knowledge exchange and CPD quality.

#### (2) Minimal Budget Encourages SCCs and Teachers to Practice CPD

The Project promoted CPD as a cost effective solution because CPD is basically organised at a place in or near the classroom. It minimizes travel costs and allowance. However, it doesn't mean CPD works without any financing. When teachers go to other schools to observe lessons, when SEOs monitor school-based CPD etc., transportation costs are needed. In fact, the Project bore travel costs and allowances when we organized the school visits and Open Day. Nonetheless, as the above Rulindo case showed, the cost is affordable. Rulindo district could budget DCC and SCC activity costs and schools could use capitation grants for school visits. In other districts (such as Kamonyi and Huye), SCCs have utilized existing budget for SEOs' monitoring, as well as schools' capitation grant. Even minimal and affordable financing encourages DCC and SCC members to process various CPD initiatives.

#### (3) DCC Takes Roles to Activate SCCs

CPD empowers teachers to improve lessons and other teacher duties. Thus, SCCs should be the main agency to directly support teachers. In fact, Rulindo district is an example of SCCs coordinating actual CPD activities such as inter-school CPD. It implies the key for CPD promotion is the activation of SCCs. Conversely, DCC dedicated to support SCCs through policy making (planning), reporting and financing. Rulindo maintains a solid structure to harmonize and synergize CPDs in the district.

## 5.2 Remaining Issues

### 5.2.1 Lesson Improvement

#### (1) Subject Matter Expert

The Project sent Japanese and Rwandan subject matter experts to facilitate math and science Lesson Study in model schools. Teachers in model schools insisted this support is the speciality of the Project and differentiates our CPD with others. Experts have given useful advice and alternative ideas needed for lesson improvement according to the lesson context. These tasks should be taken by SBMs and School Subject Leaders (SSLs). They have been trained by IEE

and BLF. However, the training doesn't cover all level (For instance, BLF trains SSL at the lower primary level only at the moment).

#### (2) Instructional Language

In Lesson Study, the Project encouraged teachers to apply questioning and rephrasing as much as possible to enable "indirect teaching" for higher order thinking development. The approach requires higher language ability by both teachers and students to understand each other. However, the Project observed cases where both teachers and students struggled to communicate as they could only use limited vocabulary and phrases.

### 5.2.2 CPD Promotion

#### (1) Terminology

Overall, expansion of CPD in Rwanda is steady. All schools organized CPD and 98% of teachers participated in it according the ELS of the Project. Many DPs are working on CPD promotion nowadays and introducing various CPD programs. Such diversity of CPD promises to sustain and improve CPD culture in Rwanda. Meanwhile, different terminologies are being used in CPD such as Lesson Study, Community of Practice (CoP), Mentoring and Peer Learning. They currently confuse teachers and hamper efficient communication among stakeholders. Ultimately, it makes the monitoring and reporting difficult.

#### (2) CPD time

Time allocated (or the lack there of) for CPD is always the main obstacle or complaint of teachers. However, our Lesson Study practice proved schools can incorporate CPD time into the timetable and teachers can use it. Thus, sparing time for CPD is not that difficult. What the actual hardship for teachers and schools will be the coordination of various CPD activities. As mentioned above, DPs are currently introducing different CPD programs and resource materials. These allow schools to use their program, but CPD time allows teachers to practice some of CPD program only.

#### (3) Monitoring and Reporting

Although we observed evidence on steady CPD expansion nationwide, the Project struggled to collect reports. As described in the previous chapter, the submission rate of CPD reports to REB remained at 50%. The Project tried different types of report forms to find out the optimal solution, but reactions were not very active in any case. After this undesired result, the Project initiated discussions with other DPs to develop a comprehensive online reporting system. We invited some DDEs, DEOs, SEOs and HTs to the workshop to make the system user-friendly. However, regardless of whether it is user-friendly or not, the success of the reporting all depends on the motivation of the reporters and supervisors who follow up with it. This is evidenced by the fact that in most of the districts that had established a reporting system between DCC and SCCs, the submission rate of reports from SCCs was 100%, while the rate was 0% in districts which had not yet established such a system. The awareness on reporting continues to be one of the major challenges.

#### (4) Communication between REB, MINEDUC and MINALOC to Effectively Mobilize SEOs

DCC and SCC are the key actors to drive and harmonize CPD in schools. However, various education initiatives such as CPD, school feeding, comprehensive assessment, career guidance, ICT, STEM education, school health, etc., always overwhelm members. Command, announcement and information are often congested. It is also one of the causes in the difficulty of monitoring and reporting.

# 6. Recommendations

## 6.1 Perspective of Successful CPD

### 6.1.1 Recent Policy Efforts Towards a Conducive Environment for CPD

The situation surrounding CPD in Rwanda has improved dramatically. Policies and rules related to CPD have been developed, and the number of stakeholders involved in CPD has increased significantly. Various CPD guidelines and resource materials have been developed and distributed to CPD practitioners. No other country has achieved the rapid improvement of their CPD environment in such a short time.

Table 6-1 shows the major official actions and measures on CPD taken by the Rwandan government and DPs who support CPD initiatives in recent years.

**Table 6-1: Major CPD Related Actions in Recent Years**

| CPD Related Actions and Measures | | Year |
|---|---|---|
| Policy level | Education Sector Strategic Plan (ESSP)<br>Teacher Statute<br>Teacher Development and Management (TDM) policy<br>National Teacher CPD Framework | 2017<br>2019<br>TBD<br>2019 |
| Other decisions and Announcement | Career path advancement (CPD as one of main criteria)<br>Request to include CPD in Imihigo | 2019<br>2019 |
| Nationally authorized Manuals & Guidelines | DCC guideline<br>SBMP Framework<br>School-based CPD manual | 2016<br>2016<br>2019 |
| Authorized CPD course | CPD Diploma/Certificate Courses in UR-CE<br>*Mandatory accredited CPD course for teachers and school leaders will start from FY2021* | |
| DPs working for CPD (Frequent members in TPD-TWG) | JICA (SIIQS), DFID (BLF), UNICEF (SBMP), USAID (Soma Umenye), VVOB, VSO, British Council, Mastercard Foundation (AIMS), Wellspring, Educate!, Aegis Trust | |

The table indicates policy framework and resource materials about CPD theories are well maintained in Rwanda. Hence, we need to consider how we transform these policies and theories into real CPD practice.

### 6.1.2 Towards Successful CPD

#### (1) Transformation of CBC/CPD Policies and Theories into Practice

*"If* you *want to improve teaching, the most effective place to do so is in the context of a classroom lesson. If you start with lessons, the problem of how to apply research findings in the classroom disappears."*[9]

The above citation simply represents the essence of CPD. CPD must be organized to improve the teacher's duty which is of course their teaching and lessons. If we want teachers to conduct good lessons, the best way is to refine their classroom teaching directly. Teachers struggle to apply new learning theories in their classroom, because they learn the theories outside of the classroom. Why don't we train teachers in their classroom? Why don't we introduce new learning theories in the lesson context?

[9] Stigler J. W. & Hiebert J. (1999, p.111) "The Teaching Gap: Best Ideas from the World's Teachers for Improving Education in the Classroom", New York Free Press.

Responding to these questions, we introduced Lesson Study approach in model schools. Darling-Hammond, Hyler and Gardner (2017)[10] identified seven characteristics of effective teacher professional development. Lesson Study satisfies all of the features as shown in Table 6-2.

**Table 6-2: Seven Characteristics of Effective Teacher Professional Development**

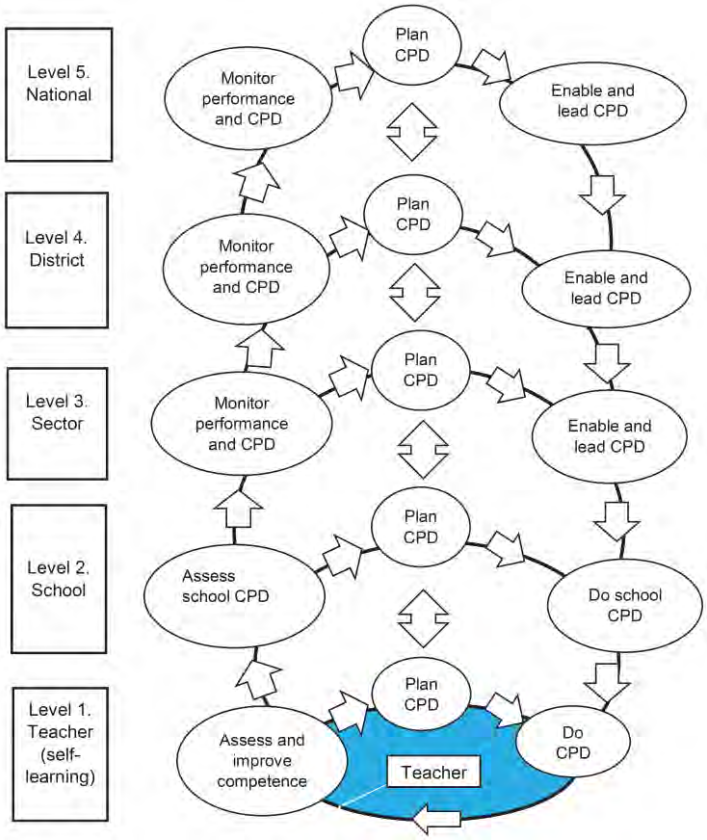
| Effective CPD Model Feature | Description | Interpretation in Lesson Study |
|---|---|---|
| 1: Is content focused | Focuses on teaching strategies associated with specific curriculum content within teachers' classroom contexts. | Targets a specific lesson and develops a lesson plan |
| 2: Incorporate active learning | Engages teachers directly in designing and trying out teaching strategies, while providing them an opportunity to engage in the same style of learning they are designing for their students. | Offers teachers active and participatory lesson planning, micro-teaching, research lesson and reflection |
| 3: Supports collaboration | Creates space for teachers to share ideas and collaborate in their learning, often in job-embedded contexts | Encourages teachers to discuss and collaborate to develop lessons together. |
| 4: Uses models of effective practice | Provides teachers with a clear vision of what best practices look like. | Applies a certain technique or model in research lesson. |
| 5: Provides coaching and expert support | Shares expertise about content and evidence-based practices, focused directly on teachers' individual needs. | Engages experts, DOS, SBM and SSL in CPD to provide advice in the context. |
| 6: Offers feedback and reflection | Provides built-in time for teachers to think about, receive input on, and make changes to their practice by facilitating reflection and soliciting feedback | Ensures time for reflection and revision of the lesson plan both after micro-teaching and at the end of the program |
| 7: Is of sustained duration | Provides teachers with adequate time to learn, practice, implement, and reflect upon new strategies that facilitate changes in their practice. | Consists of a continuous plan, do and reflect cycle integrated in daily school life. |

We can use any kind of CPD approaches such as CoP and Coaching by SBMs as long as the approach accommodates the above seven key elements. However, what is not effective is where a trainer gives a lecture to transfer knowledge (theories), and trainees (teachers) memorize these theories. These teachers are not actively learning. Those who are involved in CPD should keep the seven elements in mind when planning CPD activities.

### (2) Strengthening the Problem Solving Cycle

In order to transform policies and theories into practice, it is essential to strengthen the "Problem-Solving Cycle" from the school to the national levels as shown in Figure 6-1. The "Problem Solving Cycle" is the key concept which the Project aimed to establish. This was officially adapted in the National Teacher CPD Framework. Thus, it is now the time to think "How do we operate this cycle properly?" Education Officers have been informed about new policies and political decisions. Individual schools have managed to conduct CPD activities. Teachers have had various opportunities to learn theories to improve their teaching practices. It is crucial that comprehensive CPD mechanisms more than ever are reinforced with planning, implementing, monitoring and evaluating activities. This will bring about genuine CBC lessons that enhance learning at schools. The following section will propose possible actions to achieve this.

[10] Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective teacher professional development. Palo Alto, CA: Learning Policy Institute.




Source: Ministry of Education. (2019, p.25). National Teacher CPD Framework[11]

**Figure 6-1: Problem Solving Cycle from School to National Levels**

## 6.2 Recommended Actions

### 6.2.1 Technical Aspects

#### (1) Utilization of TTCs and Demonstration Schools

With the support of the World Bank, the government of Rwanda plans to strengthen TTCs by renovating facilities and improving teaching. Demonstration schools will serve as model schools in each region, and the quality of lessons will be improved through teaching practices. There is an opportunity that CPD could also be introduced at this pre-service level. In general, lesson observers can provide comments and advice for student teachers more freely than for in-service teachers, because their lessons are often unskilled, and therefore, they are usually more open to advice and feedback in order to improve. This kind of environment and atmosphere is one effective way to initiate an active discussion in Lesson Study. Lesson Study fits teaching practice, in fact, all teacher trainees in Japan are requested to implement research lessons during internships at schools. Therefore, this reform of pre-service teacher training system in Rwanda is a great opportunity to introduce Lesson Study in various places. It will also link pre-service and in-service teacher training seamlessly.

#### (2) Provision of Sustainable Expert Support

One of the biggest questions that still remains here to continuously satisfy the elements of effective teacher professional development is “Who will provide the expert support after the

[11] Ministry of Education. (2019). The national teacher CPD framework. Kigali, Rwanda: Author.

project experts leave Rwanda?" In Japan, each sector assigns senior teachers as CPD supervisors who are excellent both in pedagogy and subject (districts support some small sectors where such excellent teachers are low in numbers). The CPD supervisor works at the sector education office under the sector director of education and rotates every couple of years.

A similar system can function in Rwanda too. A system of comprehensive assessment was introduced from primary to secondary levels in January 2019. The ministerial guideline of comprehensive assessment requested districts to appoint at least three trained teachers for each subject to form assessment teams. The teams will develop district-level assessment papers for learners, and there may be potential for them to become CPD supervisors. Here, we can refer to the SBMP approach to establish sustainable SSL training system. During the CBC induction training, they were appointed and led subject-wise school-based CPD. By now, roles of SSLs are not well defined in the official document and its position is fragile. Unlike SBMs, who have two Sector-Based Mentor Trainers (SBMTs) in each sector, SSLs don't have sector-based trainers who regularly provide trainings for them. We propose here to officially maintain a SSL framework like SBMP and comprehensive assessment teams may serve as trainers of SSLs. Language is covered by SBMTs and SBMs, thus other examinable subject areas such as mathematics, science and technology, humanity and entrepreneurship should be covered by district assessment teams and SSLs. This strategy can establish a coherent teacher support system from lesson delivery to assessment.

### 6.2.2 Administrative Aspects

#### (1) Encouragement of Flexible Funding

CPD is diversifying in Rwanda now. Various CPD approaches and methods are proposed and the variety definitely promotes active learning. To encourage teachers to be active learners, training providers and coaches should regularly update CPD methods and introduce new ideas in CPD so that teachers can continue CPD without getting burned out. Flexible funding enables such an active learning environment.

#### (2) Provision of Officer's Feedback and Assessment of CPD Impact

Even in the case of well-designed CPD, poor monitoring and reporting impede the effectiveness of professional learning and hinder its impact on student learning and achievement. Without a sense of what is functioning and why, it is hard to adopt and implement CPD for teachers that is evidence-based and designed to address potential obstacles. The creation of the online monitoring and reporting system for tracking CPD is underway. However, the system won't work without data collection. School leaders and education officers should regularly collect information of CPD activities and track the progress. REB is requesting districts to include CPD in their district performance contract (Imihigo). It will incentivize the submission of reports and consequently promote evidence-based CPD, but officers should ensure to provide feedback to the reports for better implementation.

#### (3) Harmonization of Monitoring Efforts

As mentioned earlier, driving the "Problem Solving Cycle" should be the key for success to nurture CPD across the country. Considering that more than half of the SCCs submit CPD reports to DCCs, the online monitoring and reporting system is likely to function as expected. However, SEOs also submit paper-based monthly reports to MINEDUC which include all education issues in their respective sectors such as school facilities, drop-out rates, school hygiene and CPD. As the report form includes CPD, coordination between REB and MINEDUC to minimize duplication of SEOs' work and harmonize the system is crucial for effective and efficient monitoring.

## 6.3 Conclusion

In Rwanda, CPD has been widely spread in response to teachers' needs such as shifting to English as language of instruction and adaptation to CBC in order to improve lessons. However, the introduction of CBC has brought on various professional development needs of teachers, such as ICT, inclusive education, and career guidance, in addition to lesson improvement. These needs should be addressed by CPD, too. In fact, REB has indicated in the TPD-TWG in December 2019 that the mandatory CPD course will be implemented from FY2021, which includes 1) teaching methods, 2) inclusive education, 3) career guidance, 4) ICT, 5) self-awareness, 6) coaching, and 7) educational assessment. This is individual-based CPD (online courses may be available for teachers in remote areas), which is different from cluster-based CPD conducted in schools and sectors, such as Lesson Study and CoP. CPD activities are increasing in number and variety. The diversity will sustain CPD and establish Rwanda's home-grown CPD nature. However, we should not forget the phrase - "if you want to improve classroom practice, the most effective place to do so is in the context of a classroom lesson". Our experience suggests that teachers need further practice in the classroom in order to apply theories in the lessons.

The induction of the comprehensive assessment will naturally increase all stakeholders' interest in learning achievement. Its district-level assessment in the second term, and national assessment in the third term will enable education officers to easily compare the assessment results. Consequently, officers, school leaders and teachers will be able to understand weaknesses in lessons. The Project always started with problem and objective analysis when planning lessons in Lesson Study and developing action plans in the DCC workshops. The comprehensive assessment may generate serious momentum to improve learning achievement through CPD, and the Problem Solving Cycle at school, sector, district and national levels will be eventually firmly consolidated.

# Afterword

Teachers are the ones who deliver effective CBC lessons. Until this ambition for teacher education in Rwanda is fulfilled, the challenges continue. There is still a long road ahead to achieve this goal.

Teaching skills are not something that can be learned overnight. It is not hard to imagine the hardships of the teachers who were suddenly forced to change to a completely new teaching style. The challenges experienced in our Project are real and not unique to these teachers.

The World Bank (2008, p.95)[12] mentioned "Changing teachers' classroom practices does not work by replacement, but by incremental change over sustained periods of time supported by coaching activities of peers, heads of department and external agencies." Thus, CPD is important.

The nationwide CPD system has not yet functioned at a satisfactory level. Various issues arose in our Project, however, teachers we observed were trying their best to make their lessons interactive and participatory. We have also observed many officers in the field who have been dedicated to providing substantial support for CPD.

We do believe that Rwanda will successfully create the CPD nature throughout the country. That is definitely the engine for a knowledge-based society. We are looking forward to seeing a CPD rich county in the near future.

December 2019, Kigali

[12] World Bank. (2008). Curricula, examinations, and assessment in secondary education in Sub-Saharan Africa.

# Appendices

# Appendix 1. PDM Version 1

# ANNEX: Project Design Matrix (PDM)

Project Title: Project for Supporting institutionalizing and Improving Quality of SBI Activity

Implementing Agency: Rwanda Education Board (REB)

Target Group: Primary, lower secondary, and upper secondary school

Project Period: January, 2017 - December 2019 (three years)

Target Area: REB (Kigali), Schools (Nationwide)

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumptions |
|---|---|---|---|
| **Overall Goal** | | | |
| Students' learning process in classroom is improved. | 1) Degree on Student participation in lessons.<br>2) Result of the test (e.g. TIMSS type) to evaluate the conceptual understanding of learners. | 1) Survey in sampled schools<br>2) Survey in sampled schools | |
| **Project Purpose** | | | |
| Implementation of CBC-based lesson in the classroom is strengthened through SBI activities. | 1) Quality of lesson plans developed by teachers<br>2) Result of lesson observation focusing on teachers' behavior<br>3) Result of lesson observation focusing on learners' behavior | 1) Survey in sampled schools<br>2) Lesson observation in sampled schools<br>3) Lesson observation in sampled schools | |
| **Outputs** | | | |
| 1. Teachers' understanding of CBC-based lesson implementation is enhanced. | 1) Result of understanding test of workshop participants<br>2) Self-evaluation of teachers' understanding of CBC-based lesson | 1) Questionnaire survey to trainees<br>2) Questionnaire survey to trainees | PCs are distributed to all SEOs and used by them.<br><br>Textbooks are distributed to all schools. |
| 2. Problem-solving capacities are enhanced at school, sector, district, and national level. | 1) Understanding of participants in workshop<br>2) Good practices of SBI and CBC lessons at school<br>3) Rate of schools implementing SBI<br>4) Rate of reports submitted using developed report forms | 1) Questionnaire survey to trainees<br>2) Monitoring Report, DCC minutes<br>3) Questionnaire survey for SEO<br>4) Monitoring Report | |
| **Activities** | **Input** | | |
| 0-1 Baseline survey<br>0-2 End-line survey<br>1-1 To develop a CBC-based lesson guideline (including lesson planning manual, tips, etc.).<br>1-2 To develop CBC-based lesson samples (e.g. video).<br>1-3 To develop a guideline on CBC-based lesson assessment.<br>1-4 To conduct workshops regarding CBC-based lesson implementation.<br>1-5 To support model schools to develop good practices on CBC-based lessons.<br>2-1 To develop a practical guideline on functioning DCC.<br>2-2 To raise awareness about the importance of DCC and to enhance understanding of the roles (e.g. workshop).<br>2-3 To develop a SBI implementation manual (including the procedure).<br>2-4 To develop a guideline on observing CBC-based lessons.<br>2-5 To design monitoring forms (including electronic form, simple and user-friendly) by reviewing the existing ones and conducting a rapid survey.<br>2-6 To conduct training for REB by JICA Experts to develop the capacity to collect and analyze data, and to develop solutions.<br>2-7 To conduct training for REB and National Trainers (including professors of UR-CE) to develop the capacities to evaluate CBC-based lessons by JICA Experts.<br>2-8 To conduct training for HT/SEO/DEO to develop the capacities to evaluate CBC-based lessons, to collect and analyze data, and to develop solutions<br>2-9 To conduct monitoring on the situation of CBC and SBI implementation (including email questionnaire survey and technical advice).<br>2-10 To develop materials to address challenges identified in the reports submitted to REB.<br>2-11 To conduct a training based on the materials developed above for REB and National Trainers. | **Japanese Side**<br>1. Expert<br>Teaching Method Specialist<br>Math and/or Science education Specialist<br>Monitoring Specialist<br><br>2. Equipment and Materials<br>When necessary | **Rwandan Side**<br>1. Counterpart personnel and administrative personnel<br><br>2. Suitable office space with necessary equipment including utility cost<br><br>3. Training Cost: REB will provide the necessary budget for local training. | Budget for conducting cascading workshop after 2017 is ensured.<br><br>**Pre-condition**<br>Security condition of Rwanda is stable, etc.<br><br>Major Stakeholders collaborate with the project<br><br>SBI is continuously used as the measure for CBC implementation. |

# Appendix 2. PDM Version 2

Project Design Matrix

**Version 2**
Date: 7th Novermber 2019

**Project Title: Project for Supporting institutionalizing and Improving Quality of SBI Activity**
**Implementing Agency: Rwanda Education Board (REB)**
**Target Group: Primary, lower secondary, and upper secondary school (74,584 teachers)**
**Period of Project:January, 2017 - December 2019 (three years)**
**Project Site: Kigali (REB)**
**Model Site: EP Buhande, GS Kabuye Catholique, GS Mukarange Catholique, GS APAGIE Musha, GS St Aloys Rwamagana, Lycee Notre Dame des Apotres Rwaza (86 teachers)**

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumptior |
|---|---|---|---|
| **Overall Goal** | | | |
| Students' learning process in classroom is improved. | 1) More students in model schools than those in non-model schools present relevant responses to an open question posed by a teacher.<br><br>2) Result of the academic achievement test developed by the Project improves more in model schools compared to non-model schools. | 1) Lesson observation in sampled schools*<br><br>2) Results of the academic achievement test in sampled schools | |
| **Project Purpose** | | | |
| Implementation of CBC-based lesson in the classroom is strengthened through SBI activities. | 1) Lesson plans developed by teachers in model schools include five focused elements out of six specified in Competence 2.1 of the National Teacher CPD Framework.<br><br>2) Teachers give more open questions in model schools compared to non-model schools. | 1) Lesson plans developed by Lesson Study in sampled schools<br><br>2) Lesson observation in sampled schools | |
| **Outputs** | | | |
| 1. Teachers' understanding of CBC-based lesson implementation is enhanced. | 1) Post-test results of participants in trainings and workshops including an e-learning course exceed 70%.<br><br>2) Self-evaluation of teachers' understanding of CBC-based lessons continues to be 90% or above. | 1-1) Post questionnaire survey to participants in technical stream of CBC training<br>1-2) Online CPD course assessments<br><br>2-1) Questionnaire survey at sampled schools<br>2-2) Questionnaire survey to participants in technical stream of CBC training | PCs are distributed to all SEOs and used by them.<br><br>Textbooks are distributed to all schools. |
| 2. Problem-solving capacities are enhanced at school, sector, district, and national level. | 1) All sectors implement sector-based CBC training.<br><br>2) More than one good practice of school-based CPD is reported quarterly from all DCCs that have been establised.<br><br>3) The rate of teachers' participation in school-based CPD increases from 75% (baseline) to 90%.<br><br>4) More than 50% of DCCs and SCCs submit monitoring reports using a developed form on a termly basis. | 1) Monitoring conducted by REB<br><br>2-1) Termly Monitoring Report submitted by DCCs and SCCs<br>2-2) Quarterly Monitoring Report<br><br>3-1) Questionnaire in sampled schools<br>3-2) Termly Monitoring Report submitted by DCCs<br><br>4) Termly Monitoring Report submitted by DCCs and SCCs | |

| Activities | Inputs | | |
|---|---|---|---|
| | **The Japanese Side** | **The Rwandan Side** | |
| 0-1 Baseline survey<br>0-2 End-line survey<br>1-1 To develop a CBC-based lesson guideline (including lesson planning manual, tips, etc.).<br>1-2 To develop CBC-based lesson samples (e.g. video).<br>1-3 To develop a guideline on CBC-based lesson assessment.<br>1-4 To conduct workshops regarding CBC-based lesson implementation.<br>1-5 To support model schools to develop good practices on CBC-based lessons.<br>1-5-1 To support Lesson Study to share good CPD practices nationwide.<br>1-5-2 To measure learners achievement in Lesson Study<br>2-1 To develop a practical guideline on functioning DCC.<br>2-2 To raise awareness about the importance of DCC and to enhance understanding of the roles (e.g. workshop).<br>2-2-1 To conduct workshops on DCC<br>2-2-2 To support DCC in conducting an Open Day to share good CPD practices.<br>2-3 To develop a CPD implementation manual (including the procedure).<br>2-4 To develop a guideline on observing CBC-based lessons.<br>2-5 To design monitoring forms (including electronic form, simple and user-friendly) by reviewing the existing ones and conducting a rapid survey.<br>2-6 To conduct training for REB by JICA Experts to develop the capacity to collect and analyze data, and to develop solutions.<br>2-6-1 To enhance capacity of REB to collect and analyze data and to develop solutions through the need assessment survey of CBC training.<br>2-7 To conduct training for REB and National Trainers (including professors of UR-CE) to develop the capacities to evaluate CBC-based lessons by JICA Experts.<br>2-8 To conduct training for HT/SEO/DEO to develop the capacities to evaluate CBC-based lessons, to collect and analyze data, and to develop solutions.<br>2-9 To conduct monitoring on the situation of CBC and CPD implementation (including email questionnaire survey and technical advice).<br>2-9-1 To collect quantitative data of CBC and CPD implementation through termly monitoring.<br>2-9-2 To collect qualitative data of CBC and CPD implementation through quarterly monitoring.<br>2-10 To develop materials to address challenges identified in the reports submitted to REB.<br>2-10-1 To elaborate analysis reports of monitoring (including good CPD practices).<br>2-11 To conduct a training based on the materials developed above for REB and National Trainers.<br>2-11-1 To conduct a national DCC/SCC forum to enhance monitoring mechanisms. | 1. Expert<br>Teaching Method Specialist<br>Math and/or Science education Specialist<br>Monitoring Specialist<br><br>2. Equipment and Materials<br>When necessary | 1. Counterpart personnel and administrative personnel<br><br>2. Suitable office space with necessary equipment including utility cost<br><br>3. Training Cost: REB will provide the necessary budget for local training. | Budget for conducting cascading workshop after 2017 is ensured.<br><br>**Pre-Conditions**<br>Security condition of Rwanda is stable, etc.<br><br>Major Stakeholders collaborate with the project<br><br>SBI is continuously used as the measure for CBC |

*Sampled schools(11): model schools(6) + non-model schools(5
Model schools are listed below.
- EP Buhande
- GS Kabuye Catholique
- GS Mukarange Catholique
- GS APAGIE Musha
- GS St Aloys Rwamagana
- GS Notre Dame des Apôtres Rwaza

Non-model schools are listed below.
- EP Bukinanyana ADEPR
- GS Gihogwe Catholique
- GS Bubazi
- Lycée Notre Dame de la Visitation (LNDV
- GS Rambura Garçons

**Five focused elements are listed below.
1. Clear and measurable learning outcomes and objectives and activities to achieve them.
2. Learning outcomes and objectives support learners to move from simple and familiar to more complex and sophisticated knowledge and skills
3. Regular revision of learning and learning assessments.
4. Adaptions for specific learners.
5. Use a range of TLRs, vary interaction patterns

# Appendix 3. Equipment List

| No. | Name of Equipment | Type | Currency | Price | Date of purchase (YYYY/MM/DD) | Note | after the project period |
|---|---|---|---|---|---|---|---|
| 1 | All-in-one printer | WorkCentre 7225 | USD | 6,386 | 2017/1/26 | Printing under wired connection | Handed over to REB |
| 2 | Laptop PC | HP Probook Core i5 450 | RWF | 650,000 | 2017/1/17 | | Handed over to REB |
| 3 | Laptop PC | HP Probook Core i5 450 | RWF | 650,000 | 2017/1/26 | | Handed over to REB |
| 4 | Laptop PC | HP Probook Core i7 | RWF | 650,000 | 2017/5/22 | | Handed over to REB |
| 5 | Projector | Epson EB-1761W | JPY | 65,284 | 2017/2/19 | | Handed over to REB |
| 6 | Action camera (wearable camera) | Telepathy Walker TPC008 | JPY | 92,592 | 2017/3/31 | | Handed over to REB |
| 7 | Projector | Sony VPL-DW126 Projector | RWF | 964,920 | 2014/2/21 | | Returned to JICA Office |

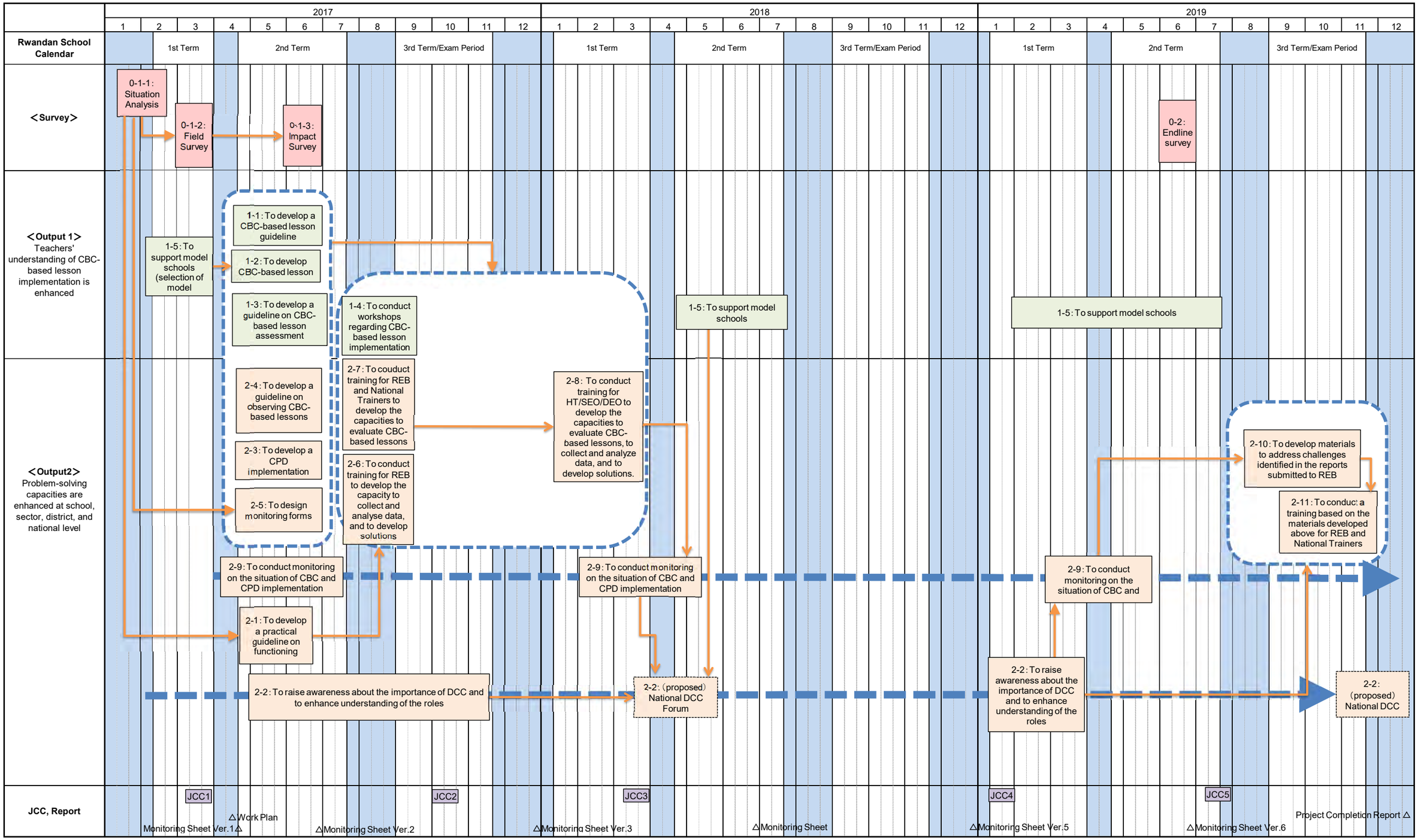
# Appendix 4. Detailed Work Plan

**Detaild Work Plan**

| Activity | | 2017 | | | | | | | | | | | | 2018 | | | | | | | | | | | | 2019 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **Rwandan School Calendar** | | 1st Term | | | | 2nd Term | | | | 3rd Term/ Exam Period | | | | 1st Term | | | | 2nd Term | | | | 3rd Term/ Exam Period | | | | 1st Term | | | | 2nd Term | | | | 3rd Term/ Exam Period | | | |
| 0-1 | Baseline survey | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0-2 | Endline survey | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Output 1** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-1 | To develop a CBC-based lesson guideline (including lesson planning manual, tips, etc.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-2 | To develop CBC-based lesson samples (e.g. video) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-3 | To develop a guideline on CBC-based lesson assessment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-4 | To conduct workshops regarding CBC-based lesson implementation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-5 | To support model schools to develop good practices on CBC-based lessons | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Output 2** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-1 | To develop a practical guideline on functioning DCC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-2 | To raise awareness about the importance of DCC and to enhance understanding of the roles (e.g. workshop) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-3 | To develop a CPD implementation manual (including the procedure) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-4 | To develop a guideline on observing CBC-based lessons | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-5 | To design monitoring forms (including electronic form, simple and user-friendly) by reviewing the existing ones and conducting a rapid survey | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-6 | To conduct training for REB by JICA Experts to develop the capacity to collect and analyse data, and to develop solutions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-7 | To couduct training for REB and National Trainers (including professors of UR-CE) to develop the capacities to evaluate CBC-based lessons by JICA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-8 | To conduct training for HT/SEO/DEO to develop the capacities to evaluate CBC-based lessons, to collect and analyze data, and to develop solutions. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-9 | To conduct monitoring on the situation of CBC and CPD implementation (including email questionnaire survey and technical advice) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-10 | To develop materials to address challenges identified in the reports submitted to REB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-11 | To conduct a training based on the materials developed above for REB and National Trainers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Report** | | Monitoring Sheet Ver.1 | | | △Work Plan | | | | △Monitoring Sheet Ver.2 | | | | | △Monitoring Sheet Ver.3 | | | | | | | △Monitoring Sheet Ver.4 | | | | | △Monitoring Sheet Ver.5 | | | | | | | △Monitoring Sheet Ver.6 | | | Project Completion Report △ | | |

# Appendix 5. Work Flow Chart

**Work Flow Chart**



# Appendix 6. Baseline Survey Report

# REPUBLIC OF RWANDA
# RWANDA EDUCATION BOARD

## Baseline Survey Report

## The Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS)

September 2017

The SIIQS project is the initiative under Teacher Education Management and Professoinalisation department (TEMP) in Rwanda Education Board (REB) assisted by PADECO Co. Ltd. through Japan International Cooperation Agency (JICA).

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# Abbreviations and Acronyms

| | |
|---|---|
| 9/12 YBE | 9 Years Basic Education School and 12 Years Basic Education School |
| AAT | Academic Achievement Test |
| AL | Active Learning |
| BLS | Baseline Survey |
| CBC | Competence Based Curriculum |
| CPD | Continuous Professional Development |
| DCC | District CPD Committee |
| DDE | District Director of Education |
| DEO | District Education Officer |
| DOS | Director of Study |
| HOT | Higher Order Thinking |
| HT | Head Teacher |
| INSET | In-Service Teacher Training |
| JICA | Japan International Cooperation Agency |
| LCP | Learner Centered Pedagogy |
| LS | Lower Secondary |
| MINEDUC | Ministry of Education |
| PS | Primary School |
| RCA | Rate of Correct Answer |
| REB | Rwanda Education Board |
| SBCT | School-based Collaborative Teacher Training |
| SBI | School-based INSET |
| SBM | School-based Mentor |
| SBT | Sector-based Trainer |
| SEO | Sector Education Officer |
| SIIQS | Supporting Institutionalizing and Improving Quality of SBI Activity |
| SSL | School Subject Leader |
| TEMP | Teacher Education Management and Professionalisation Department |
| TIMSS | Trends in International Mathematics and Science Study |
| TTC | Teacher Training College |
| TWA | Typical Wrong Answer |
| US | Upper Secondary |

# 1 Introduction of the Baseline Survey

## 1.1 Background

The introduction of a Competence-based Curriculum (CBC) calls for a major paradigm shift on teaching. With CBC, the teacher is expected not only to deliver the knowledge, but also to facilitate the learners in their learning process to attain competencies. The teacher is also expected to be the reflective practitioner, constantly thinking critically for improving lessons. This transformation must take place with all teachers, regardless of their years of experience.
The Project of Supporting Institutionalizing and Improving Quality of SBI (SIIQS Project) aims at prompting this transformation, particularly in Mathematics and Science through strengthening the School-Based INSET (SBI) framework. To this end, the SIIQS Project is to develop CBC training materials in mathematics and science for SBI, and to enhance capacities of districts and sectors for resolving problems of CBC and SBI so that schools can improve CBC lesson quality in a timely manner. Table 1-1 describes the outline of the SIIQS project.

**Table 1-1 Project Design of SIIQS**

| | |
|---|---|
| Overall Goal (Indicators) | Students' learning process in classroom is improved. |
| | 1) Degree on Student participation in lessons.<br>2) Result of the test (e.g. TIMSS type) to evaluate the conceptual understanding of learners. |
| Project Purpose (Indicators) | Implementation of CBC-based lesson in the classroom is strengthened through SBI activities. |
| | 1) Quality of lesson plans developed by teachers<br>2) Result of lesson observation focusing on teachers' behavior<br>3) Result of lesson observation focusing on learners' behavior |
| Outputs (Indicators) | (1) Teachers' understanding of CBC-based lesson implementation is enhanced. |
| | 1) Result of understanding test of workshop participants<br>2) Self-evaluation of teachers' understanding of CBC based lesson |
| | (2) Problem-solving capacities are enhanced at school, sector, district, and national level. |
| | 1) Understanding of Participants of Workshop<br>2) Good practices of SBI and CBC lessons at school<br>3) Rate of schools implementing SBI<br>4) Rate of reports submitted using developed report forms |
| Target Area | Kigali (REB) – Main workplace, Primary and Secondary schools |
| Duration | Jan. 2017 ~ Dec. 2019 (3 Years) |
| Beneficiaries | Primary school teachers (39,370), Secondary school teachers (18,593)<br>*Mainly mathematics and Science teachers |

## 1.2 Objectives

The SIIQS project conducted the Baseline Survey (BLS) as the first project activity. Objectives of BLS were 1) to grasp the current situation, 2) to collect baseline data for benchmarking to monitor the progress of the project and 3) to identify potential obstacles which may interrupt project activities. Key focus areas were as follows;

### 1.2.1 Curriculum Delivery

The SIIQS project assumed the curriculum delivery model as shown in Figure 1-1. If the steps in the figure are completely fulfilled, students attain competences as expected. The project needs to understand issues and challenges of curriculum delivery to improve the situation.

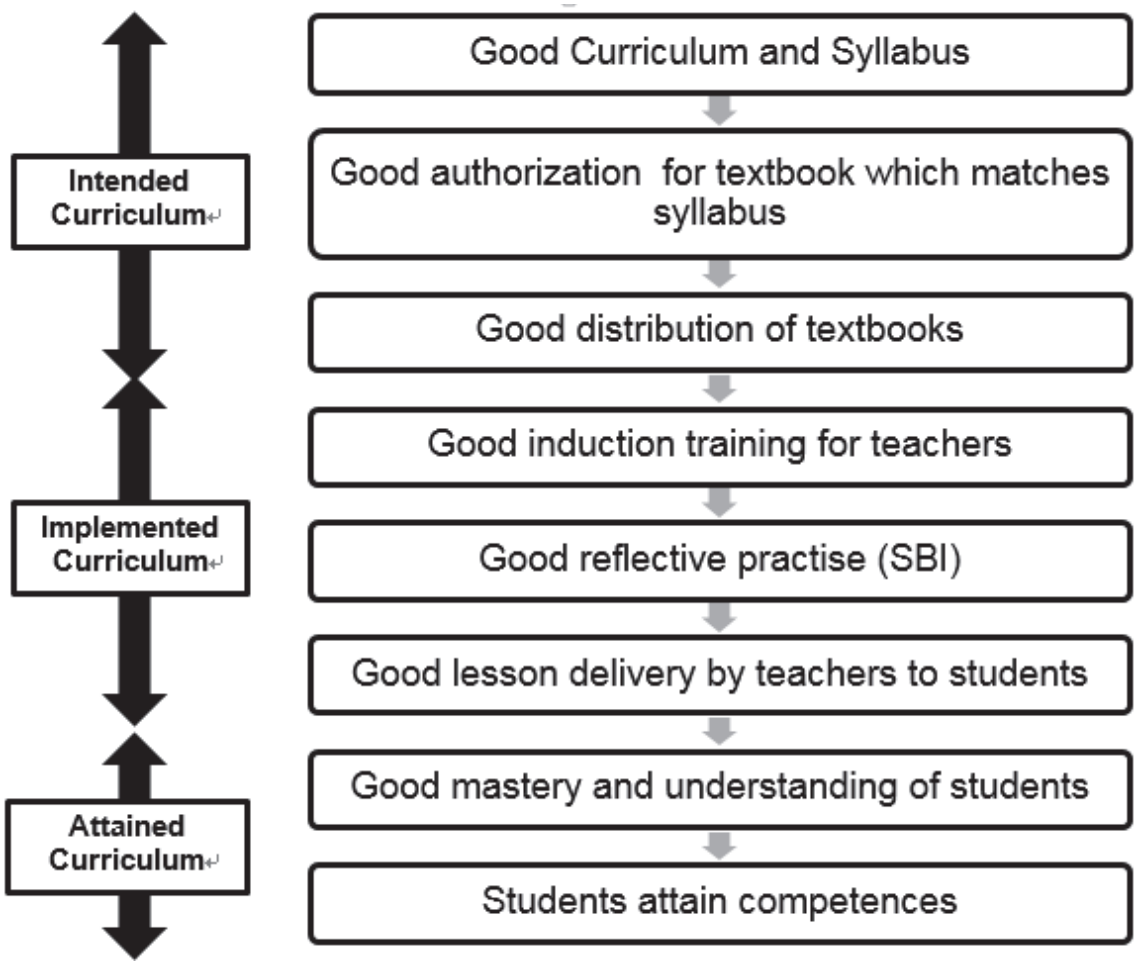



**Figure 1-1 Curriculum Delivery Model**

### 1.2.2 SBI Status

When CBC was inducted in 2016, CBC trainings for in-service teachers were cascaded from national to school level. All teachers had to be trained in schools as a form of SBI. Thus, it is important to investigate how each school conducted SBI for further SBI promotion. It should be noted that education stakeholders have intended to harmonize terminology and agreed to use the term Continuous Professional Development (CPD) which corresponds to SBI. In this BLS, the term “SBI” shall be replaced with “CPD” as appropriate.

### 1.2.3 CBC and SBI support mechanisms for district and sector

In 2016, REB requested all districts to establish a committee to promote CPD of teachers to ensure quality CBC and SBI practices in each school nationwide. The District CPD Committee (DCC) and Sector CPD Committee (SCC) were designated to be the main body to support and drive the CPD activities. The project should understand the current status of DCC and SCC in order to develop the plan to enhance the capacity of them.

## 1.3 BLS Target Areas and Groups

BLS mainly targeted the following groups.

### 1.3.1 Schools

BLS surveyed Head Teachers (HT), Director of Studies (DOS), teachers and students in primary, lower secondary and upper secondary levels. Teachers who teach the grades which CBC has been introduced, that is; P1, P2, P4, P5, S1, S2, S4, S5 are targeted. BLS covered all districts in four Provinces and Kigali City.

### 1.3.2 DCCs

BLS surveyed District Education Officers (DEOs) of the districts where targeted schools are located.

## 1.4 Methodology

### 1.4.1 Overview

BLS is phased in three stages, from situation analysis to academic achievement test (AAT) as shown in Table 1-2.

**Table 1-2 Outline of BLS**

| Stage | Period | Curriculum delivery | SBI Status | Support Mechanism |
|---|---|---|---|---|
| Situation Analysis | Jan – Mar | n/a | ・Interview w/ TEMP<br>・Observation of Sector-SBI | ・Literature review on Imihigo<br>・Telephone interview on DCC formation |
| Field Study | Mar | ・Lesson observation<br>・Interview with HT(DOS) and Teachers<br>・Questionnaire survey to HT(DOS) and Teachers | ・Interview with HT (DOS) and Teachers<br>・Questionnaire survey to HT(DOS) and Teachers | ・Interview to DEO |
| Academic Achievement Test (AAT) | Jun | ・Academic Achievement Test (AAT) | n/a | n/a |

#### (1) Situation Analysis

Situation Analysis is the preparatory stage to elaborate research questions for field study and AATs, so that the project can select target areas for the field study and design survey tools properly.

### (2) Field Study

Field Study is the main activity of BLS to analyze the actual current situation of final target groups.

### (3) Academic Achievement Test

AATs were conducted based on the preliminary findings of the field study. AATs were prepared to measure students' performance.

### 1.4.2 Selection of Schools for Field Study

Target schools were selected from seven districts to cover all the provinces. The survey team consulted with DEOs to select the schools, as they know the situation of schools well. In order to grasp the whole picture of CBC implementation status, all types of schools ranging from primary, secondary, and 9/12 year basic education (9/12 YBE) were selected from nearly all the districts. The team attempted to include both good performing and poor performing schools. Table 1-3 shows the 20 selected schools.

**Table 1-3 List of Selected School[1]**

| Province | District | Sector | School name | School Type[2] |
|---|---|---|---|---|
| Northern | Musanze (MSZ) | Musanze | Centre Scolaire Muhe (CS Muhe) | PS |
| | | Kinigi | GS Muhoza I | 9/12 |
| | | Remera | GS Notre Dame des Apotres de Rwaza (GS NDAR) | SS |
| | Rulindo (RLD) | Bushoki | EP Buhande | PS |
| | | Kinihira | GS Kinihira | 9/12 |
| | | Bushoki | Lycée Notre Dame de la Visitation Rulindo (LND) | SS |
| Western | Karongi (KRG) | Rubengera | EP Rubengera I | PS |
| | | Rubengera | GS Bubazi | 9/12 |
| | | Rubengera | GS Nyarubuye | 9/12 |
| | Nyabihu (NBH) | Jenda | EP Bukinanyana ADEPR (EP Bukinanyana) | PS |
| | | Rambura | GS St Raphael Rambura (GS St Rapahel R) | 9/12 |
| | | Rambura | GS Rambura Garçons (GS Rambura G) | SS |
| Southern | Muhanga (MHG) | Nyamabuye | EP Remera | PS |
| | | Shyogwe | GS Munyinya | 9/12 |
| Eastern | Rwamagana (RWG) | Gahengeri | EP Runyinya | PS |
| | | Gahengeri | GS Apagie Musha | SS |
| | | Kigabiro | GS St Aloys Rwamagana (GS St Aloys RWG) | SS |
| Kigali | Gasabo (GSB) | Rutunga | EP Gasabo | PS |
| | | Gatsata | GS Gihogwe Cathorique (GS Gihogwe) | 9/12 |
| | | Jabana | GS Kabuye Cathorique (GS Kabuye) | 9/12 |

## 1.5 Preparation of Survey Tools

A set of questionnaires and interview sheets for HTs and teachers were prepared to gauge the current CBC and SBI status at schools. Outlines of the school survey tools are listed below.

[1] Words in brackets are abbreviations for districts and schools used in this report.
[2] PS: Primary School, SS: Secondary School, 9/12: 9 years or 12 years Basic Education School

### 1.5.1 Questionnaire for Head Teachers

To collect the general information about schools and status of CBC and SBI, a questionnaire for head teachers (Appendix A) was prepared. It covered the following items:

- Basic information (name, school type and facilities)
- Status of SBI and CBC
- Status of School Based Mentor (SBM) and School Subject Leader (SSL)

### 1.5.2 Questionnaire for school teachers

The questionnaire for teachers (Appendix B) aims at understanding teachers' impression of SBI and CBC, and participation in school-based CBC induction training which was supposed to be conducted in the previous fiscal year. It covered the following items:

- Basic information (name, gender, years in service, etc.)
- Impression and experience of SBI and CBC
- Attendance of school-based CBC induction training
- Perception of school management

### 1.5.3 Interview with HT and teachers

Interview sheets with HT (Appendix C) and teachers (Appendix D) were designed to gain a clear understanding of their situation and to extract further information or their true feelings. Interviews with teachers were conducted as a group. It covered the following items:

Interview sheet with HT

- Overall impression of CBC
- Implementation of SBI
- Performance contract (Imihigo)

Interview sheet with teachers

- Overall impression of CBC
- Implementation of SBI
- General problems

### 1.5.4 Academic Achievement Test (AAT)

AATs with multiple choice questions were developed to grasp students' comprehension in mathematics and science (Appendix E). The tests were for P4, S1 and S4, which are the initial grades that CBC was introduced in 2016. The process of test question development included reviewing of curriculum and collection of textbooks and other teaching materials, and extraction of some questions from past national exams, TIMSS (Trends in International Mathematics and Science Study) and AATs from other countries. The tests covered different topic areas evenly and included questions which students learned in previous grades. The tests were designed to be completed within 40 minutes. Multiple choice options were carefully considered so that the survey team could also analyze why they reached wrong answers.

## 1.6 Field Study

### 1.6.1 Schedule

In consideration of the school calendar, the field study was conducted in March and April as shown in Table 1-4. Basically, two sub teams were formed to conduct the survey simultaneously.

**Table 1-4 Detailed Field Study Schedule**

| Date | Day | District | Team A | Team B |
|---|---|---|---|---|
| 8 March | Wed | (Kigali) | Orientation | |
| 9 March | Thu | MHG | | - GS Munyinya<br>- EP Remera |
| 10 March | Fri | RWG | | - GS Apagie Musha<br>- EP Runyinya |
| 11 March | Sat | | | - |
| 12 March | Sun | | | - |
| 13 March | Mon | GSB | - GS Gihogwe<br>- EP Gasabo | - District Education Office |
| 14 March | Tue | RLD | - LND<br>- EP Buhande | - GS Kinihira<br>- District Education Office |
| 15 March | Wed | MSZ | - GS NDAR<br>- CS Muhe | - GS Muhoza I<br>- District Education Office |
| 16 March | Thu | NBH | - GS Saint Raphael<br>- EP Bukinanyana | - GS Rambura G<br>- District Education Office |
| 17 March | Fri | KRG | - GS Nyarubuye<br>- EP Rubengera I | - GS Bubazi<br>- District Education Office |
| | | | | |
| 24 April<br>26 April | Mon<br>Wed | GSB<br>RWG | - GS Kabuye<br>- GS St Aloys RWG | |

### 1.6.2 Survey Team

The BLS sub teams were formed with selected Rwandan counterpart personnel from TEMP, Japanese experts and survey assistants. The following members listed in Table 1-5 participated in the field study.

**Table 1-5 Survey Team Members**

| Name | Affiliation | Sub team |
|---|---|---|
| Mr. Antoine MUTSINZI | Acting Director of Teacher Development and Training Unit, TEMP | A |
| Ms. Ruth MUKAKIMENYI | Teacher Training Officer: Language, Teacher Training & Development Unit, TEMP | A |
| Mr. Ryuichi SUGIYAMA | Team Leader/ Pedagogy (Japanese Expert) | B |
| Ms. Kyoko Yoshikawa IWASAKI | Deputy Team Leader/ Institutional Development (Japanese Expert) | B |
| Ms. Yumiko ONO | Educational Evaluation (Japanese Expert) | A |
| Ms. Sayaka MATSUZUKI | Monitoring/Project Coordinator (Japanese Expert) | B |
| Ms. Berthine GIKUNDIRO | Project Officer | B |
| Mr. Hashituky HABIYAREMYE | Survey Assistant | B |
| Mr. Kizito NDIHOKUBWAYO | Survey Assistant | A |

### 1.6.3 Survey Timetable

BLS activities were organized through prior arrangement and on-site consultation between HT and the survey team, to effectively conduct the survey without interfering with school activities and lessons. One to two schools were visited per sub team/ per day. A standard timetable of BLS at a school is shown in Table 1-6.

**Table 1-6 Survey Organization at a School**

| | |
|---|---|
| AM | **School A** |
| | Lesson Observation/Video Shooting |
| | HT Interview/Questionnaire survey |
| | Teacher Interview/Questionnaire survey |
| PM | **School B** |
| | Lesson Observation/Video Shooting |
| | HT Interview/Questionnaire survey |
| | Teacher Interview/Questionnaire survey |

## 1.7 Academic Achievement Test

### 1.7.1 Schedule

The AAT tests were conducted in five selected schools out of 20 target schools of the field study in June. They were, EP Buhande and Lycee Notre dame de la Visitation (LND) in Rulindo district, GS Apagie Musha and GS St Aloys Rwamagana (GS St Aloys RWG) in Rwamagana district and GS Kabuye in Gasabo district. Table 1-7 shows the schedule.

**Table 1-7 AAT Schedule**

| Date | Day | District | School |
|---|---|---|---|
| 16 June | Fri | RLD | - EP Buhande<br>- LND |
| | | RWG | - GS Apagie Musha<br>- GS St Aloys RWG |
| 23 June | Fri | GSB | - GS Kabuye |

### 1.7.2 Survey Team

A survey team was formed with Japanese experts and local staff listed in Table 1-8. They were involved in the development of test questions and supervision of administered tests at schools.

**Table 1-8 Survey Team Members**

| Name | Affiliation |
|---|---|
| Mr. Kenji OHARA | Mathematics Education (Japanese Expert) |
| Mr. Keiichi NAGANUMA | Science Education (Japanese Expert) |
| Ms. Berthine GIKUNDIRO | Project Officer |
| Mr. Hashituky HABIYAREMYE | Survey Assistant/ Monitoring Officer |
| Mr. Kizito NDIHOKUBWAYO | Survey Assistant/ Monitoring Officer |
| Ms. Anathalie NIYIDUKUNDA | Secretary/Accountant |

# 2 Composition of the Samples and Limitations

## 2.1 Sample Size

### 2.1.1 Sample size in Field Study

In the field study, data was collected from a total of 20 schools in seven districts across four provinces and Kigali City as shown in Table 2-1. The number of lessons observed was 20. All HTs participated in the questionnaire and interview. A sum of 178 teachers responded to the questionnaire, and 139 teachers among them were selected to participate in the interview. In some schools, two lessons in different grades were observed. Gender balance was considered when selecting interviewees from teachers.

**Table 2-1 Sample Size of Field Study**

| District | Sector | School Name | School Type | LO* | Questionnaire | | Interview | |
|---|---|---|---|---|---|---|---|---|
| | | | | | HT(DOS) | Teacher | HT(DOS) | Teacher |
| MSZ | Musanze | CS Muhe | PS | 1 | 1 | 7 | 1 | 3 |
| | Kinigi | GS Muhoza I | 9/12 | 1 | 1 | 6 | 1 | 6 |
| | Remera | GS NDAR | SS | 1 | 1 | 12 | 1 | 1 |
| RLD | Bushoki | EP Buhande | PS | 1<br>1 | 1 | 9 | 1 | 7 |
| | Kinihira | GS Kinihira | 9/12 | 1 | 1 | 9 | 1 | 9 |
| | Bushoki | LND | SS | 1 | 1 | 6 | 1 | 6 |
| KRG | Rubengera | EP Rubengera I | PS | 1 | 1 | 9 | 1 | 9 |
| | Rubengera | GS Bubazi | 9/12 | 1 | 1 | 8 | 1 | 8 |
| | Rubengera | GS Nyarubuye | 9/12 | 1 | 1 | 7 | 1 | 7 |
| NBH | Jenda | EP Bukinanyana | PS | 1 | 1 | 4 | 1 | 4 |
| | Rambura | GS St Raphael R | 9/12 | 1 | 1 | 8 | 1 | 8 |
| | Rambura | GS Rambura G | SS | 1 | 1 | 10 | 1 | 10 |
| MHG | Nyamabuye | EP Remera | PS | 1 | 1 | 15 | 1 | 15 |
| | Shyogwe | GS Munyinya | 9/12 | 1 | 1 | 15 | 1 | 15 |
| RWG | Gahengeri | EP Runyinya | PS | 1 | 1 | 5 | 1 | 5 |
| | Musha | GS Apagie Musha | SS | 1 | 1 | 4 | 1 | 5 |
| | Kigabiro | GS St Aloys RWG | SS | - | 1 | 12 | 1 | 0 |
| GSB | Rutunga | EP Gasabo | PS | 1 | 1 | 12 | 1 | 12 |
| | Jabana | GS Kabuye | 9/12 | - | 1 | 11 | 1 | 0 |
| | Gatsata | GS Gihogwe | 9/12 | 1<br>1 | 1 | 9 | 1 | 9 |
| | | | Total | 20 | 20 | 178 | 20 | 139 |

* Lesson Observation

### 2.1.2 Sample size of Academic Achievement Test (AAT)

Students in target schools were requested to sit for either a mathematics test or science test. The team tried to keep even the number of students who took the mathematics test and those who took the science test. Table 2-2, Table 2-3 and Table 2-4 shows the sample size of the AAT for mathematics and science at each level.

AAT for P4 was implemented in EP Buhande and GS Kabuye. GS Kabuye was a pilot SBI school in the Project of School-based Collaborative Teacher Training (SBCT Project), located in Gasabo district, Kigali City, and it achieved outstanding improvements in the national examination after adopting SBI. EP Buhande is a primary school located in the Rulindo district, and its performance in the national examination is almost average. The total number of students who took the AAT is 164 for mathematics and 192 for science respectively.

**Table 2-2 Sample Size of AAT for P4**

| Province | District | Sector | School Name | School Type | # of Students[3] | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Math | | Science | | |
| | | | | | Male | Female | Male | Female | |
| Northern | RLD | Bushoki | EP Buhande | PS | 9 | 12 | 6 | 15 | 42 |
| Kigali | GSB | Jabana | GS Kabuye | 9/12 | 59 | 84 | 96 | 74 | 313 |
| | | | | Total | 68 | 96 | 102 | 89 | 355 |

The AAT for S1 was implemented in secondary schools; Lycee Notre Dame de la Visitation (LND), GS Apagie Musha and GS St Aloys Rwamagana (GS St Aloys RWG). GS St Aloys RWG is a pilot SBI school in the SBCT Project, located in the Rwamagana district, that also improved in the national exams upon adopting SBI. LND and GS Apagie Musha are well performing schools which attain above-average grades in the national examination. The total number of students who took the AAT was 156 for mathematics and 146 for science respectively.

**Table 2-3 Sample Size of AAT for S1**

| Province | District | Sector | School Name | School Type | # of Students | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Math | | Science | | |
| | | | | | M | F | M | F | |
| Northern | RLD | Bushoki | LND | SS | - | 25 | - | 22 | 47 |
| Eastern | RWG | Musha | GS Apagie Musha | SS | 38 | 26 | 21 | 32 | 117 |
| | | Kigabiro | GS St Aloys RWG | SS | 34 | 33 | 39 | 32 | 138 |
| | | | | Total | 72 | 84 | 60 | 86 | 302 |

[3] One student who took the math test did not specify gender, thus the total number does not match the sum of the sample.

The AAT for S4 was implemented in the same schools as for S1. The total number of students was 193 for mathematics and 158 for science respectively. In GS St Aloys RWG, one class of students who did not take any science subjects as elective subjects all sat for the mathematics test, so the number of students who took mathematics exceeded that of science.

**Table 2-4 Sample Size of AAT for S4**

| Province | District | Sector | School Name | School Type | # of Students | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Math | | Science | | |
| | | | | | M | F | M | F | |
| Northern | RLD | Bushoki | LND | SS | - | 28 | - | 28 | 56 |
| Eastern | RWG | Musha | GS Apagie Musha | SS | 23 | 22 | 23 | 29 | 97 |
| | | Kigabiro | GS St Aloys RWG | SS | 61 | 59 | 42 | 36 | 208 |
| | | | | Total | 84 | 109 | 65 | 93 | 351 |

## 2.2 Composition of the Samples

### 2.2.1 Teacher Respondents to the Questionnaire

Table 2-5 shows the composition of teacher respondents by gender and academic qualification.

**Table 2-5 Composition of Samples for Teacher Questionnaire**

| School Type | District | School Name | Male | | | | | Female | | | | | Total[4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A0 | A1 | A2 | N/A | Sub-total | A0 | A1 | A2 | N/A | Sub-total | |
| PS | GSB | EP Gasabo | - | 1 | 6 | - | 7 | - | - | 3 | 2 | 5 | 12 |
| | KRG | EP Rubengera I | - | - | 2 | - | 2 | - | - | 6 | 1 | 7 | 9 |
| | MHG | EP Remera | - | 1 | 1 | - | 2 | 1 | - | 8 | 4 | 13 | 15 |
| | MSZ | CS Muhe | - | - | 3 | 1 | 4 | - | - | 2 | 1 | 3 | 7 |
| | NBH | EP Bukinanyana | - | - | 3 | - | 3 | - | - | 1 | - | 1 | 4 |
| | RLD | EP Buhande | - | - | 1 | 1 | 2 | 1 | - | 5 | - | 7 | 9 |
| | RWG | EP Runyinya | - | - | - | 1 | 1 | - | - | 4 | - | 4 | 5 |
| | | PS Total | 0 | 2 | 16 | 3 | 21 | 2 | 0 | 29 | 9 | 40 | 61 |
| 9/12 | GSB | GS Gihogwe | 2 | 1 | - | - | 3 | 4 | 1 | - | - | 5 | 9* |
| | | GS Kabuye | 3 | - | - | - | 3 | 2 | - | 6 | - | 8 | 11 |
| | KRG | GS Bubazi | - | - | 1 | - | 1 | 1 | 1 | 5 | - | 7 | 8 |
| | | GS Nyarubuye | - | - | 1 | - | 1 | 2 | 2 | 2 | - | 6 | 7 |
| | MHG | GS Munyinya | 2 | 2 | 3 | - | 7 | 3 | - | 4 | 1 | 8 | 15 |
| | MSZ | GS Muhoza I | - | - | 1 | 2 | 3 | - | - | 2 | 1 | 3 | 6 |
| | NBH | GS St Raphael R | 1 | 4 | 1 | 1 | 7 | - | 1 | - | - | 1 | 8 |
| | RLD | GS Kinihira | 1 | - | 1 | 1 | 3 | - | 1 | 5 | - | 6 | 9 |
| | | 9/12 Total | 7 | 6 | 8 | 4 | 25 | 8 | 5 | 24 | 2 | 39 | 64 |

[4] One teacher did not specify gender, thus the total number does not match the sum of the sample.

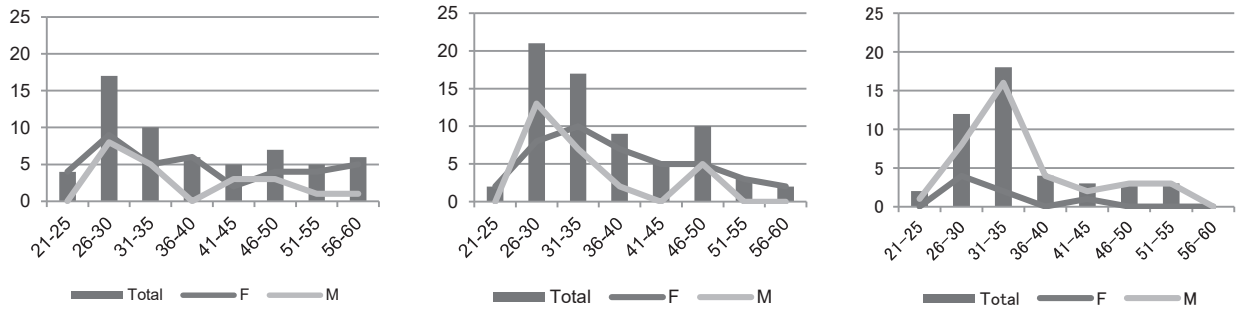
| School Type | District | School Name | Male | | | | | Female | | | | | Total[4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | A0 | A1 | A2 | N/A | Sub-total | A0 | A1 | A2 | N/A | Sub-total | |
| SS | MSZ | GS NDAR | 5 | 2 | - | 2 | 9 | 2 | 1 | - | - | 3 | 12 |
| | NBH | GS Rambura G | 6 | 3 | - | - | 9 | 1 | - | - | - | 1 | 10 |
| | RLD | LND | 5 | - | - | - | 5 | 1 | - | - | - | 1 | 6 |
| | RWG | GS Apagie Musha | 3 | - | 1 | - | 4 | - | - | - | - | - | 4 |
| | | GS St Aloys RWG | 10 | - | - | - | 10 | 2 | - | - | - | 2 | 12 |
| | SS Total | | 5 | 5 | 2 | 3 | 40 | 6 | 2 | 5 | 0 | 13 | 53 |
| Grand Total | | | 14 | 14 | 25 | 9 | 86 | 20 | 7 | 53 | 11 | 91 | 178 |

Most of the primary school teachers hold A2 level qualification, which is equivalent to twelve-years basic education. Almost all secondary school teachers hold either A1 (Diploma Level) for lower secondary teaching or A0 (Degree Level) for upper secondary teaching.

The average age and years are almost the same across school types (See Table 2-6 and Figure 2-1). However, male teachers in 9/12YBE schools and female teachers in secondary schools are younger than those in other schools. The number of years in service reflects their age.

**Table 2-6 Average Age and Years in Service by School Type**

| School Type | Total | | | Male | | | Female | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ave. Age | Ave. Years in Service | *N* | Ave. Age | Ave. Years in Service | *N* | Ave. Age | Ave. Years in Service | *N* |
| PS | 38.3 | 14.5 | 61 | 36.7 | 10.5 | 21 | 39.3 | 16.4 | 40 |
| 9/12 | 36.3 | 11.7 | 72 | 33.9 | 8.6 | 28 | 37.9 | 13.7 | 44 |
| SS | 36.3 | 10.3 | 44 | 37.0 | 10.4 | 37 | 32.4 | 9.7 | 7 |
| Total | 37.0 | 12.3 | 177 | 35.9 | 9.8 | 86 | 38.0 | 14.6 | 91 |




PS 9/12 SS

**Figure 2-1 Age Distribution by School Type**
**(Horizontal Axis: Age group, Vertical Axis: Number of Respondents)**

## 2.3 Limitation

### 2.3.1 Geographical Traits

Geographic characteristics were basically not considered, since the samples were not enough. The objective of BLS is to study overall trends in Rwandan schools.

### 2.3.2 Analysis of Interviews

Interviews were supplementary used to interpret quantitative data analysis results such as questionnaires and AATs. The ideas, comments and opinions suggested during the interviews are not directly argued in this BLS report.

### 2.3.3 Gender Gap

Preliminary analysis indicated that gender influences test scores. In AATs, male's scores were all higher than females. T-test method[5] detected statistically significant differences in most of them. The discussion about gender gap is eliminated from the following detailed analysis.

### 2.3.4 Progress of Lessons

Scores of AATs may be influenced by the progress of lessons taught at each school at the time of the BLS. Such differences however were hard to identify and, therefore, were not considered in the analysis.

[5] It is a statistical test to examine if average scores in two groups are significantly different or not. If a statistical significance is not detected by the test, average scores are recognized as same.

# 3 Readiness of CBC Implementation (Implementation status of intended curriculum at school level)

## 3.1 Distribution of resource materials

The questionnaire for HTs revealed the distribution status of resources (See Table 3-1). Only six schools out of 20 had syllabuses for all subjects. Half of the schools answered that they had a syllabus for some subjects. There were two schools which did not have any syllabus at all. The distribution status of textbooks at schools is similar to that of syllabuses. While textbooks for all subjects were available at five schools, two schools had no textbooks at all. This implies that the intended curriculum of availability of CBC-related documents has not yet been satisfied.

**Table 3-1 Organization of induction training at school level**

| Material | For all subjects | For some subjects | None | N/A |
|---|---|---|---|---|
| Syllabus | 6 (30%) | 10 (50%) | 2 (10%) | 2 (10%) |
| Textbook | 5 (25%) | 11 (55%) | 2 (10%) | 2 (10%) |

## 3.2 Implementation of CBC training at school level

### 3.2.1 CBC Training Phase I

The Questionnaire for HTs asked about the implementation record of CBC training phase I (See Table 3-2). More than half of the HTs responded that they fully implemented the CBC trainings for phase I, while 45% of them stated that they partly implemented. There was no HT who did not organize any CBC training.

**Table 3-2 Organization of induction training at school level**

| School Type | Fully | Partly | Not Organized |
|---|---|---|---|
| PS | 4 | 3 | 0 |
| 9/12 | 4 | 4 | 0 |
| SS | 3 | 2 | 0 |
| Total | 11 (55%) | 9 (45%) | 0 (0%) |

The Questionnaire for teachers asked about their participation in the CBC trainings (See Table 3-3). Less than 50% of teachers attended the full training, while 15.6% of teachers either missed or stated that their school did not organize CBC training. Lastly, 37% only attended part of the training. Attendance varied among school settings, with the lowest attendance observed in the Basic Education Schools.

**Table 3-3 Teachers' Attendance of Induction Trainings**

| School Type | Fully attended | Partially attended | Missed | Was not organized at school |
|---|---|---|---|---|
| PS | 25 (41.7%) | 29 (48.3%) | 5 (8.3%) | 1 (1.7%) |
| 9/12 | 27 (38.6%) | 22 (31.4%) | 8 (11.4%) | 13 (18.6%) |
| SS | 30 (69.8%) | 13 (30.2%) | 0 (0.0%) | 0 (0.0%) |
| Total | 82 (47.4%) | 64 (37.0%) | 13 (7.5%) | 14 (8.1%) |

Table 3-4 gives a broader picture of the implementation status of the CBC induction training phase I as a reference. This data was collected during the follow-up survey of the SBCT project. 22 DEOs responded to a monitoring form on the organization status of induction training at the school level. Within the districts, nearly 90% of schools conducted CBC induction training, but there is a possibility that some schools only partially conducted the training. The number of teachers who missed the training were 2,331, or 5%. Given that the number of teachers in the schools which did not conduct the training is not included, overall, a considerable number of teachers have not received the training. Since REB has aimed at ensuring all teachers in the country are CBC trained, this situation should be taken seriously.

**Table 3-4 Organization of Induction Training at School Level According to the Monitoring (2016)**

| District submitted the monitoring form | # of schools which conducted CBC induction training | # of Teachers who missed the CBC induction training |
|---|---|---|
| 22 (73.3%) | 2,790 (88.4%) | 2,331 (4.8%) |

### 3.2.2 Characteristics of teachers who did not participate in CBC training

To investigate what are the characteristics of teachers who did not attend the trainings, an exploratory factor analysis was employed. Five factors were eventually derived: shared school vision, participatory school management, collegiality for lesson improvement, evidence-based school planning, and resource persons as shown in Table 3-5.

**Table 3-5 Result of Exploratory Factor Analysis**

| Factors | Questions | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Communality |
|---|---|---|---|---|---|---|---|
| Shared school vision | There are clear aims or objectives at my school. | **.923** | -.062 | -.126 | .071 | -.030 | .747 |
| | There is a cooperative system among different subjects at my school. | **.722** | -.112 | .185 | -.174 | .358 | .710 |
| | The vision/mission of my school is shared among school community members. | **.667** | .085 | .111 | .025 | -.097 | .608 |
| | The vision/mission of my school is/are clearly stated. | **.623** | .241 | .003 | .000 | -.125 | .576 |
| Participatory school management | My head teacher is supportive in improving teaching and learning at my school. | -.043 | **.980** | .023 | .061 | -.179 | .873 |
| | The school leaders encourage us to give some comments/ ideas to contribute to school improvement. | .232 | **.545** | -.038 | -.041 | .120 | .521 |
| | My opinions often contribute to the process of making decisions at my school. | -.024 | **.511** | .234 | .016 | .139 | .523 |
| | My students' parents/guardians contact me to talk about the students' performance. | .023 | **.423** | .053 | -.040 | .269 | .373 |
| Collegiality for lesson improvement | I often give advice/consultation to my colleagues to improve their teaching. | -.012 | .065 | **.851** | -.076 | .178 | .843 |
| | I often receive advice/consultation from my colleagues to improve my teaching. | -.134 | .044 | **.743** | .075 | .172 | .613 |
| | I am willing to share my good lesson practices with my colleagues. | .135 | .083 | **.648** | -.079 | -.058 | .549 |
| | I use the feedback/advice given by my colleagues to improve my teaching and learning process. | .062 | -.094 | **.595** | .215 | .085 | .502 |
| Evidence-based school planning | School activities proceed as planned at my school. | -.225 | .004 | .149 | **.815** | .042 | .583 |
| | I regularly contact my students' parents/guardians to talk about the students' performance. | -.018 | .015 | -.238 | **.616** | .446 | .624 |
| | The objectives and plans are achieved successfully at my school. | .153 | -.023 | .086 | **.531** | -.077 | .412 |
| | Results from the national examination are analyzed by all teachers together. | .232 | .102 | -.201 | **.507** | .164 | .513 |
| | I make an effort to attain the vision/mission of my school. | .290 | -.104 | .296 | **.463** | -.353 | .597 |
| | Objectives and plans are developed based on evidence and data at my school. | .308 | .055 | .001 | **.404** | .117 | .503 |
| Resource persons | A School-based Mentor (SBM) at my school helps me improve my lesson. | -.018 | -.016 | .101 | .054 | **.574** | .371 |
| | A School Subject Leader (SSL) at my school helps me improve my lesson. | -.077 | -.019 | .280 | .053 | **.553** | .425 |

Then, these factors were compared with teachers' participation, divided into three categories; fully attended the CBC trainings (Group1), partly attended (Group2) and did not attend at all (Group3). The factor scores for each group were plotted on a graph (as shown in Figure 3-1). It was found that Group 1 responded positively, while Group 2 were more or less neutral, and Group 3 were negative. The results suggest the importance of supporting an environment which encourages teachers' participation in school-based trainings, such as good school management, collaborative colleagues and effective resource persons. These aspects may reduce the difficulties around cascade training in reaching all target teachers, and therefore, should be emphasized when considering future training framework.

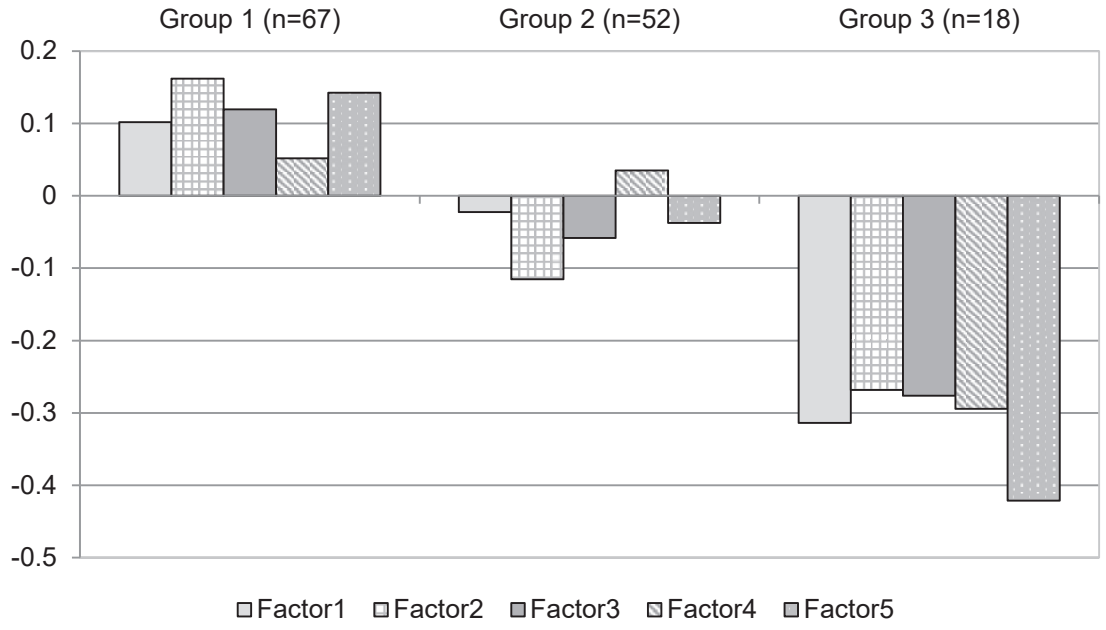



**Figure 3-1 Factor Score by Participation**

### 3.2.3 CBC Training Phase II

Phase II of CBC training in technical stream consisted of three layers; National Trainers trained Sector-Based Trainers (SBTs) at three centers and SBTs trained teachers in each sector.

There has been a significant delay in delivering the last layer of the CBC training at the sector level as described in Table 3-6. The plan was to complete the sector-based training before starting the academic year 2017. However, in addition to issuing a letter to request Sector Education Officers (SEOs) to conduct sector-based trainings, SEOs needed to be trained. It was in May 2017 when training for SEOs was conducted. They were instructed to conduct orientation to start a series of sector-based trainings for technical stream, and finish by the second week of August. SEOs were supposed to conduct orientation at the sector level in two weeks after the SEO training.

**Table 3-6 Plan and Actual Schedule for the Last Layers of Phase II Training**

| | Plan | Actual |
|---|---|---|
| Training for Sector Based Trainers (SBT) | 3-12/1/2017 | 16-21/1/2017 |
| Training for All Teachers at Sector Level | 14-23/1/2017 | June onwards/2017 |

Figure 3-2 (below) illustrates the planned schedule timings for orientation which was summarized from REB's online monitoring system. Less than half of the sectors specified a reasonable timing for orientation, which was in between May and August. However, according to a telephone interview with SEOs, as of June 2017, most of the sectors had not yet conducted the orientation.

On the other hand, there were some sectors which conducted sector-based trainings on their own initiative without waiting for SEO training in May.

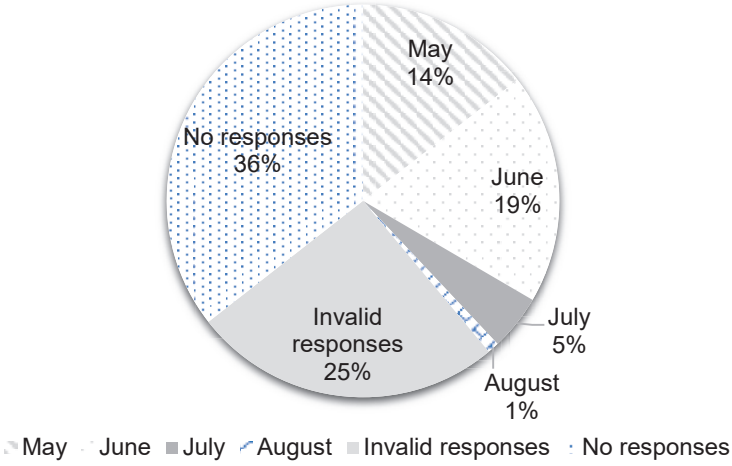



**Figure 3-2 Planned Schedule for CBC Orientation**

In September 2017, a total of 22 SEOs in Rulindo and Rwamagana districts were interviewed on the implementation status of sector-based trainings. Some SEOs conducted the orientation and training by the second week of August as requested by REB, while a few others planned for September. There were some SEOs who did not seem to have taken any action yet and were not aware of what sessions they were required to organize. One of them had conducted a training on CBC on their own.

Apart from the implementation status, they responded to a question about challenges and difficulties in organizing the trainings. They mentioned the absence of some teachers, SBTs' insufficient understanding of the training contents, lack of support from some HTs, lack of budget and lack of reporting channels, among others.

These challenges and difficulties, together with some SEOs' unawareness of their expected role, have hindered full implementation of the cascade training. Though the respondents represent only 5% of all SEOs, these issues can be found throughout the country. Measures should be taken for ensuring that SEOs take responsibility for the implementation of CBC training at the sector level.

## 3.3 Teachers' Training Needs on CBC

The questionnaire for teachers also asked about their training needs. They answered the degree to which they need training for different areas. As described in Figure 3-3, training needs for "knowledge of curriculum" was relatively high. Almost all teachers were more or less interested in it. On the other hand, training needs for "student evaluation and assessment practices", "teaching methodology in teaching my subject(s) field", "skills of English as an instructional

language", and "knowledge and understanding of my subject field(s)" were low compared to other needs. This indicates they may have been trained in those areas or may be confident in their competences.

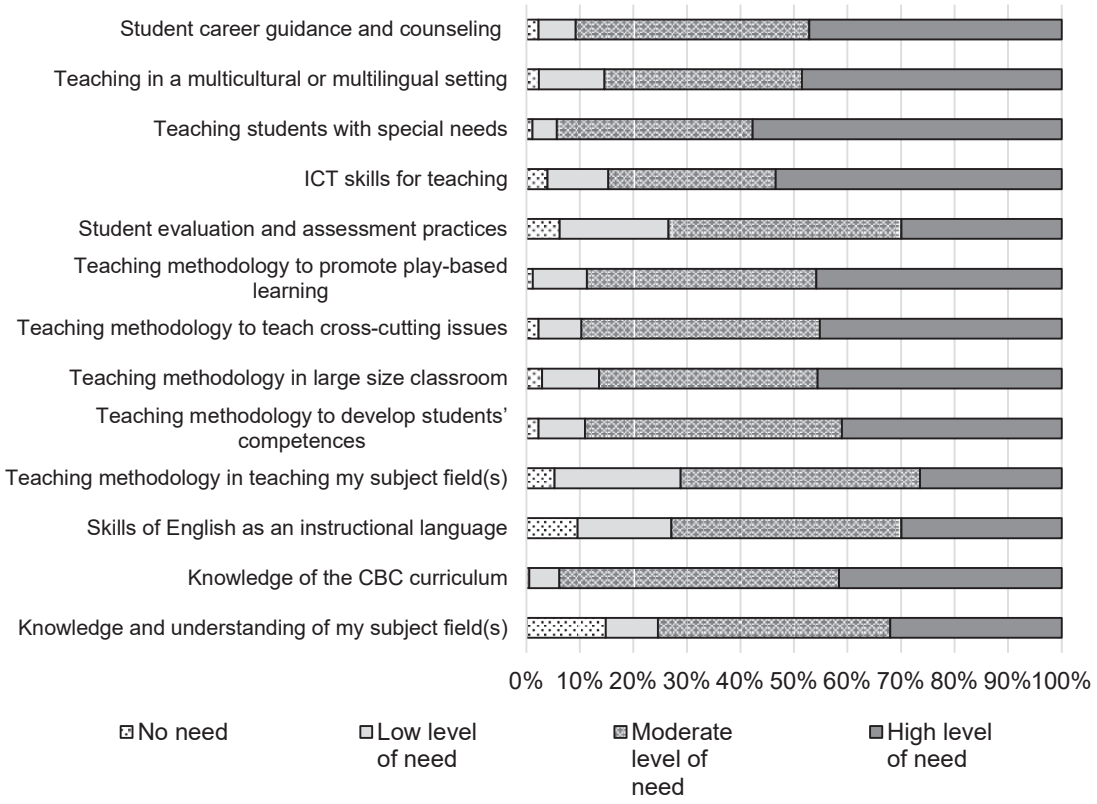



**Figure 3-3 Teachers' Training Needs**

## 3.4 Support from District with CBC Implementation

### 3.4.1 Results of Telephone Interview on DCC Status

REB issued a letter to request all districts to establish a District CPD Committee (DCC) in July 2016[6]. Since DCC is expected to play a pivotal role in the problem solving cycle (which SIIQS aims to strengthen) BLS conducted telephone interviews with DEOs across all districts to understand the establishment status of DCC in February 2017. This status information was then categorized according to the transtheoretical model of behavior change proposed by Prochaska and Velicer (1997) as shown in Table 3-7[7].

[6] In the letter, establishment of Sector CPD Committee (SCC) is advised as a sub-committee of DCC.
[7] Prochaska, J. O., & Velicer, W. F. (1997). "The Transtheoretical Model of Health Behavior Change". *American journal of health promotion: AJHP,* 12(1), 38-48.

**Table 3-7 Transtheoretical Model**

| Stages | Description |
|---|---|
| Precontemplation | Individuals do not intend to make any changes in the foreseeable future. There is no desire or interest in undertaking change. |
| Contemplation | Individuals intend to undertake change in the near future. During this stage, they consider the benefits and disadvantages of change, and may decide to pursue change or not. |
| Preparation | Individuals plan to undertake change in the immediate future. They have considered the rationale, processes, and anticipated outcomes of change and made a definite decision to engage in change. |
| Action | Individuals make specific behavioral changes and actively pursue change. |
| Maintenance | Individuals strive to avoid resuming old behaviors. Internalization and institutionalization of change occurs. |
| Termination | Individuals no longer worry about resuming old behaviors as the new behaviors have become habit. |

The results are shown in Table 3-8. Three districts claimed they already established DCC, so they can be categorized in the "action" stage. Six were considered to be motivated for establishment, so they can be categorized in the "preparation" stage. Seven were categorized in the "contemplation" stage, because they were considering pros and cons of establishment. Twelve districts did not seem to have any intention to establish DCC, and some districts were not informed of DCC. Therefore, they were categorized in the "precontemplation" stage. It should be noted that in the follow up interviews with DEOs during the field survey, three districts that stated they established DCC have not actually started any concrete activities yet. In sum, it seemed that the districts' support to schools through DCC was not functioning as expected.

**Table 3-8 Summary of DCC status (as per February 2017)[8]**

| Stage | District | DCC Status |
|---|---|---|
| Precontemplation (12 Districts) | Gatsibo | The Director of Education attended the workshop and learned about DCC but no actions have been taken for it. |
| | Nyagatare | The DEO does not know anything about DCC yet. |
| | Kayonza | The District Director of Education (DDE) does not know anything about DCC despite the district being selected as a DCC pilot in 2016. This lack of knowledge may be a result of the DDE being newly assigned after the piloting. |
| | Gakenke | The DEO knows about DCC, but nothing has been done yet in the district. |
| | Ngororero | The DEO does not know anything about DCC yet. |
| | Nyamasheke | The DEO has seen the letter but nothing was done after its reception. |

[8] Information on Ngoma and Nyaruguru districts is not available.

| Stage | District | DCC Status |
|---|---|---|
| | Rubavu | The DEO attended the workshop on DCC in 2016, but did not remember anything about DCC. |
| | Rutsiro | The DEO joined the district in August 2016 and does not know anything about it. |
| | Gisagara | The DEO attended the workshop and learned about DCC but no actions have been taken for it. |
| | Ruhango | The DEO does not know anything about DCC yet. |
| | Gasabo | The DEO does not know anything about DCC yet. |
| | Kicukiro | The DEO does not know anything about DCC yet. |
| Contemplation (7 Districts) | Bugesera | The district conducted a meeting on DCC after the workshop in 2016, but no activities have proceeded since. |
| | Kamonyi | The district had a meeting on DCC, but it's not active yet. |
| | Huye | The district had a meeting on DCC, but it's not active yet. |
| | Burera | The district received the letter and discussed it, but there have been no formal meetings about the committee establishment. |
| | Nyarugenge | The district had a meeting introducing DCC but nothing came up after it. |
| | Muhanga | The district had a meeting on DCC. |
| | Nyanza | DCC has not yet been established, but the district had a meeting about its establishment and discussed how to use the skills that trained teachers in CBC have to share with their colleagues. |
| Preparation (ready) (6 Districts) | Kirehe | The district had a regular education meeting where the DEO intended to let participants discuss DCC upon presenting the letter from REB. However, the agenda was changed and they did not discuss it. DEO plans to conduct another meeting in the coming days. |
| | Gicumbi | The DEO is eager to establish DCC, but he has not been able to follow up on it because of many challenges. He will have a meeting with Soma Umenye (USAID-based project) to request technical support about establishment of DCC. The project has a mandate of establishing a good function of DCC. |
| | Rulindo | The district has not yet conducted a meeting on DCC, but had several informal discussions. It will have the first DCC meeting in March. |
| | Nyabihu | The district was supposed to conduct a meeting in January, but rescheduled the meeting because the members were busy with the personnel changes. |
| | Rusizi | DCC is not yet active, but according to the DEO it is in the process of being established. |
| | Nyamagabe | The district has previously conducted a meeting on DCC and it is supposed to be established in February. |
| | Rwamagana | DCC was established and the district has already conducted one meeting. |
| | Musanze | DCC was established and is active. |
| | Karongi | DCC was established but the DEO thinks it is not active enough. |
| Maintenance | No District | |
| Termination | No District | |

### 3.4.2 Piloting DCC Activities

Based on telephone interviews in February 2017 and interviews with DEOs during the field study of BLS, five districts, namely; Musanze, Rulindo, Rwamagana, Gasabo and Nyarugenge were

selected to pilot sample activities that can be conducted at DCC. The pilot activities aim to extract some good practices and key factors for the operationalization of DCC.

Two pilot activities have been conducted so far. Firstly, DCC orientations was conducted in four pilot districts from April to July 2017. All members of DCC were invited, although the actual participants differed from one district to the other. The Vice Mayor, who is the chair of the meeting, attended at the beginning of the orientation in two districts, although all Vice Mayors agreed to conduct orientation and eventually to establish DCC. In the orientation, the background, rationale and structure of DCC were explained. Participants discussed several issues, for instance, demarcation between DCC and other existing platforms at the district level and possible challenges that DCC could address, and then agreed to establish the committee.

Secondly, from June to July 2017, four pilot districts held a problem analysis workshop. One district, which had not yet conducted the orientation, included an introductory session at the beginning of the workshop. The districts invited Japanese experts as facilitators. In these workshops, they analyzed the problems causing students' unsatisfactory performance in the national exam, and made action plans to address these challenges. Table 3-9 shows the schedule of DCC orientations and workshops at the districts.

**Table 3-9 Schedule of DCC Orientations and Workshops**

| District | Date of Orientation | Date of DCC workshop | Number of participants |
|---|---|---|---|
| Rulindo | 21st April | 5th July | 25 |
| Gasabo | 30th April | 30th June | 21 |
| Musanze | 2nd May | 29th June | 22 |
| Rwamagana | 6th July | 6th July | 15 |

### 3.4.3 Factors Influencing the Change

As a part of efforts to operationalize DCC, factors influencing the establishment and operationalization have been explored using existing literature. The final goal of the operationalization of DCC is to strengthen the local government's role in teachers' CPD. This requires an organizational change at the district level. Therefore, literature on organizational change has been reviewed, in order to get information on how to encourage districts and sectors to play a bigger role in promoting teachers' CPD. Fernandez and Rainey (2006) identified eight factors contributing to the success of governmental organizational change[9]. Table 3-10 shows these factors and suggestions in view of the current status regarding DCC. In the context of Rwanda, factors require a twofold process, i.e. at the central level and district level. Therefore, the status is described both at the central level and district level.

[9] Fernandez, S. & Rainey, H.G. (2006) "Managing successful organizational change in the public sector". *Public Administration Review*, 66(2), 168-176.

**Table 3-10 Factors for Organizational Change and Current Status Regarding DCC**

| Factors | Status of DCC |
|---|---|
| 1. Ensure the need | ・A letter explaining the need for DCC was distributed to all districts.<br>・However, according to the telephone interview, some districts were unaware of the letter.<br>・DCC members in the pilot districts were convinced of the importance of DCC. |
| 2. Provide a plan | ・Action plans were developed in a participatory manner based on the challenges identified in the workshop in pilot districts. |
| 3. Build internal support for change and overcome resistance | ・According to the questionnaire after the workshop, DCC members seemed to buy into the idea.<br>・However, during the workshop they tended to deflect the causes for the unsatisfactory performance of students on the central government or guardians. They tend not to consider teachers as contributing to such performance. |
| 4. Ensure top management support and commitment | ・Generally, the attendance of Vice Mayors have not been active, though all of them agreed on the establishment and some even led the process of realizing the problem analysis workshop. |
| 5. Build external support | ・REB and development partners have been promoting the idea. Some are willing to support districts in establishing and operationalizing DCC.<br>・There is a need to involve MINEDUC to ensure procurement of resources. |
| 6. Provide resources | ・Resources for teachers' CPD have not yet been availed to districts, which discourages districts in taking initiative in organizing CPD activities. |
| 7. Institutionalize change | ・Some DCC members were motivated to include teachers' CPD in their performance contract (Imihigo). |
| 8. Pursue comprehensive change | ・Comprehensive change to enhance the district role in teachers' CPD has not commenced yet. |

Factor 1 is the first step where leaders verify and communicate the need for change by providing direction for the process. At the central level, REB verified the needs for DCC and requested its establishment by issuing a letter. It should be noted that seven out of twelve districts which are categorized as "precontemplation" were not even aware of the letter. At the district level, in the pilot districts, rationale for the establishment of DCC was explained to DCC members and they consented to establish it, which means that they verified the need and communicated the establishment among the members.

Factor 2 is where leaders develop a course of action for implementing change. As part of the project activities, the SIIQS Project team together with REB, specified a plan of operationalizing DCC through nominating pilot districts and implementing pilot activities in those districts. At the district level in the pilot districts, DCC members who are representatives of different organizations in the districts, developed action plans to attain optimal changes.

Factor 3 deals with building internal support for change and reducing resistance. Individuals resist change for a variety of reasons. In the case of Rwanda at the central level, so far there has been no resistance observed regarding changes in REB. At the district level in pilot districts, DCC members appreciated the need for change, but there was a tendency of deflecting the causes for unsatisfactory performance of students to central government or guardians.

Factor 4 is where top management supports the changes. At the central government level, DG signing the letter to request establishment of DCC symbolizes the support from REB top management. However, it should be noted that the importance of DCC has not yet been instilled

at the Ministry level, at least not enough. At the district level, top management is the Vice Mayor. In the pilot districts, they also recognized the need for change, but it cannot be stated that all of them are committed to it. They seemed to be too occupied with other duties to attend the workshops.

Factor 5 is where leaders develop support from overseers and key external stakeholders. They can influence reform efforts or have the knowledge, skills and resources to manage the transformation. At the central level, although some development partners expressed their willingness to support DCCs, how to ensure the procurement of resources from the Ministry of Education (MINEDUC) is a challenge. At the district level, teachers' support for DCC may be useful. Other stakeholders that can support and advance DCC's activities need to be identified, if any.

Factor 6 is to provide resources. Fernandez and Rainey pointed out that successful change usually requires sufficient resources to support the process. Otherwise, it would limit the capacity of the implementing bodies to achieve the objectives. Unfortunately, this is the case for DCC in Rwanda. The fact that the resources for teachers' CPD are not satisfactory has restricted DCCs from bringing about successful change. At the central level, REB is expected to mobilize support from MINEDUC and the Ministry of Finance and Economic Planning to avail the resources for teacher training at the district level; while at the district level, they are expected to continue looking for alternative sources for teacher training. Good practice on how to ensure resources at the district level should also be shared.

Factor 7 is where institutionalizing change is required. It is important to incorporate the behavioral changes into routines. In the case of Rwanda, incorporating teachers' CPD into the performance contract (Imihigo) may be one of the effective ways to strengthen the role of the district and sectors in teacher education. Perhaps a guideline on how to make imihigo target(s) on teacher training from the central level or district level would help. Fernandez and Rainey also suggest the need for monitoring that ensures the changes continue even after fully adopted.

Factor 8 is the final step where leaders pursue comprehensive change. This involves subsystem congruence to harmonize the changes in terms of the organizational transformation. Rwanda has not reached this point yet.

It should be noted that most of the status at the district level described above represents the status of pilot districts. How to support establishment and operationalization of DCC in non-pilot districts should be further considered. These factors suggest priorities for the future activities. In particular, the following two issues seem to be crucial at this point in this context.

### (1) Nurturing Ownership among the DCC Members

Creating ownership is the key to successful change and this is also the very reason why DCC establishment was called for. By discussing issues related to teachers' CPD in their districts, understanding its importance in increasing students' performance and taking actions, DCC members are expected to nurture ownership in teachers' CPD in their districts. However, participants in the problem analysis workshop tended to deflect the causes for unsatisfactory

performance of students to the central government or guardians. Moreover, they tended not to consider teachers as contributing to such performance and they did not recognize their own potential or responsibility to improve the performance of teachers and students. In order to nurture ownership of DCC members, they drew up action plans by themselves. Generating success stories from their actions may help increase their commitment to DCC.

### (2) Obtaining Strong Support from Leadership to Avail a Budget for CPD

In realizing organizational change, roles of political leaders as well as administrative leaders are important, depending on phases of the change (Kuipers et al., 2014)[10]. In other words, political leadership is necessary in the decision-making phase while administrative leaders can influence the content of change during the implementation phase. As described in the previous section, the Vice Mayors' attendance to the meetings and workshops have not been very active, although they agreed to establish DCC. The motivation of DEOs towards DCC varied too. Further analysis to investigate how to motivate Vice Mayors and DEOs is needed.

One of the ways to motivate Vice Mayors and DEOs is to encourage them to include teachers' CPD in the district's Imihigo, which is the only plan at the district level budgeted properly and monitored thoroughly. Realizing that teachers' CPD is important in enhancing students' performance would be the first step to include teachers' CPD in the Imihigo. Including teachers' CPD in their own Imihigo would also help in enhancing their motivation.

However, one of the obstacles to include teachers' CPD in Imihigo or to initiate any tangible action to promote teachers' CPD at the district level is the absence of budget for teachers' CPD. Capitation grants, which are given to the schools according to the number of students does not have a specific portion which is allocated to the teachers' CPD. Instead, the budget for teachers' CPD is currently managed at the central level. Involvement of and support from MINEDUC is expected to redirect budget for teachers' CPD to local governments.

[10] Kuipers, B. S., M. Higgs, W. Kickert, L. Tummers, J. Grandia, and J. Van der Voet. (2014). "The Management of Change in Public Organizations: A Literature Review." *Public Administration,* 92 (1), 1–20.

# 4 Status of Implemented Curriculum

## 4.1 Result of lesson observation

BLS observed 20 lessons in sixteen schools. The below is the summary of findings from the lesson observations[11].

- Every teacher was preparing unit plans and lesson plans. They also encouraged and motivated learners to work collaboratively in groups. They recognized efforts of students by clapping, gestures and by signing. They were friendly and supportive. Some teachers prepared their own teaching aid. Even without textbooks and teaching materials, teachers tried hard to conduct CBC lessons.
- However, it was observed that basic knowledge and skills were not well acquired by students. For example, many upper primary students could not do simple calculations. Individual mastery of basic knowledge and skills should be a prerequisite for students to be engaged in critical and creative thinking.
- Some teachers jumped into group work without instruction or meaningful tasks. Some group works were not closely linked to the lesson objective and sometimes only a few students participated in the work. In general, it seemed that too much emphasis was placed on group work and it seemed that students were not effectively developing individually through group works.
- When asked if they understand during the lesson, students automatically answered “yes” in chorus, even though they seemed not understand. Teachers did not carefully observe students facial expression, answers to questions and exercises to assess their understanding.

## 4.2 Results of problem analysis

Issues and problems observed in the field study were sorted and analysed by survey team members. The affinity diagram was used to create a ‘problem tree’ which indicates the natural relationships between issues and problems as shown in Figure 4-1. The survey team recorded each issue and problem observed during the field study by writing it down with a marking pen on a separate sticky note and spreading them out on a large manila paper to make all the notes visible to everyone. Then, the entire team gathered around the notes and sorted out them to identify the root causes of the problems in CBC implementation.

[11] REB & JICA. (2017). *Preliminary findings from SIIQS Baseline Survey*. Kigali: REB.

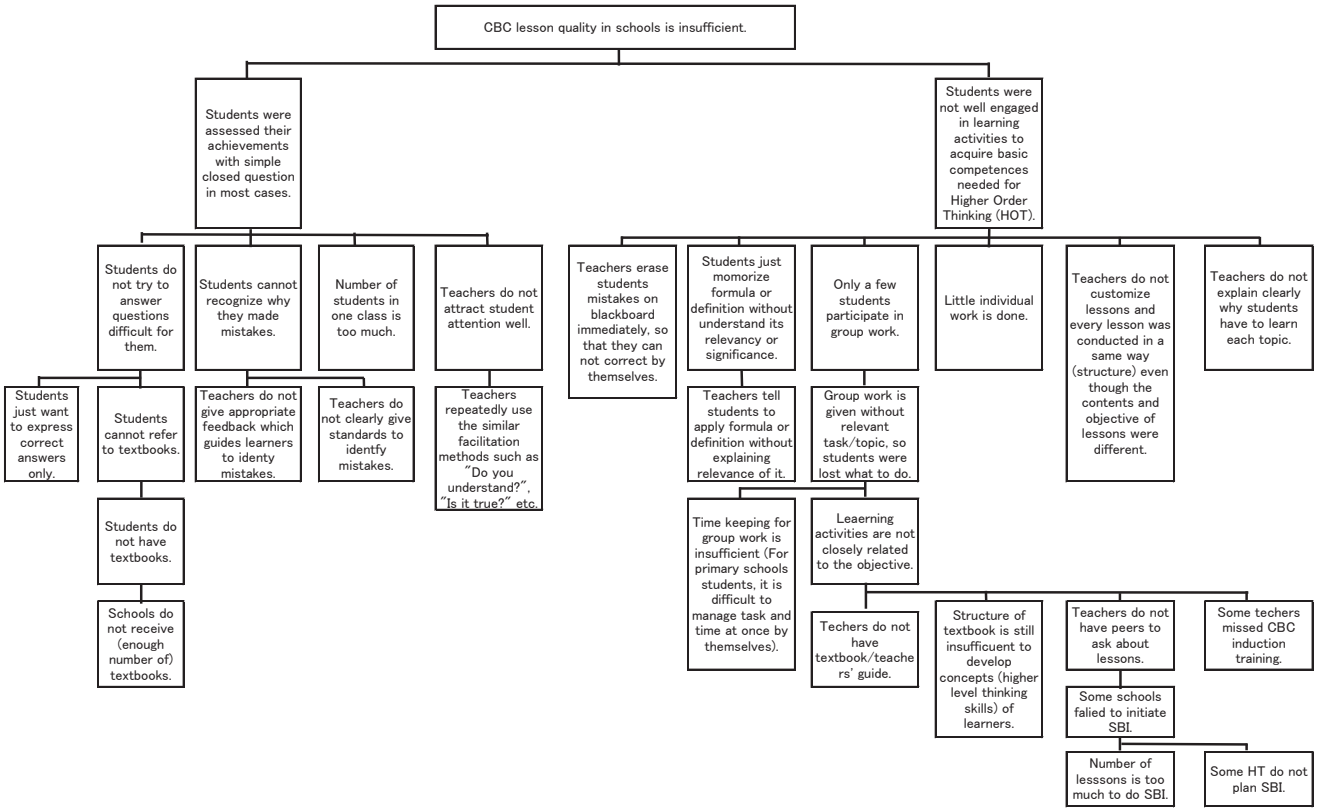



**Figure 4-1 Problem Analysis Tree**

The team lastly identified the two major hindrances of the current CBC lesson in classrooms, 1) students were assessed by their achievements with simple closed questions in most cases and 2) students were not well engaged in learning activities to acquire basic competences needed for Higher Order Thinking (HOT). The first issue stems from a formative assessment. Weak facilitation skills of teachers with some environmental problems, such as overcrowded classrooms and shortage of textbooks, prevented them from assessing students' attainment in a timely manner. The second issue is related to the weak mastery of learning and teaching approaches required in CBC lessons such as Learners Centered Pedagogy (LCP) and Active Learning (AL).

It implies that these issues should be included in the next phase III CBC induction training as its main target areas.

## 4.3 Quantitative Discourse Analysis

### 4.3.1 Methodology

In order to trace changes in the classroom discourse quantitatively, BLS used the analytical framework developed by Iketani (2009)[12]. This framework categorizes both teachers and students' utterances by its function/intention. The transcribed data was coded based on the coding guidelines (Iketani, 2009; Nakawa, 2011)[13].

Five mathematics lessons were selected from EP Bukinanyana, EP Rubengera I, EP Buhande, CS Muhe and GS St Rapahel R in Northern and Western provinces. Table 4-1 shows school category, grade, unit of the lesson, topic of the lesson and gender of the teacher. Four of the lessons were from primary schools.

**Table 4-1 Observed Lessons**

| School | EP Bukinanyana | EP Rubengera I | EP Buhande | CS Muhe | GS St Rapahel R |
|---|---|---|---|---|---|
| School Type | PS | PS | PS | PS | 9 years |
| Grade | P4 | P4 | P5 | P5 | S2 |
| Unit | Positive and negative integers | Mathematical operation on whole numbers | Addition of positive and negative integers | Equivalent fractions and operations | Polynomial functions |
| Topic | Meaning of positive and negative integers | Division of 2-digit numbers without remainders | Ordering integers | Comparing fractions | Quadratic equation |
| Teacher | Female | Female | Female | Male | Male |

### 4.3.2 Analysis of Discourse

The number and rate of teacher's utterance by code is shown in Table 4-2. Figures in the table indicate the number of each utterance that appeared in the lesson, and figures in the parentheses show the percentile rate against the total utterance of the lesson. It revealed that closed questions requiring recollection of information (e.g. 'What did we learn yesterday?'; 'Is it true?'; 'Yes or no?') were predominant in all lessons. Open or more thought-provoking questions were few, if any. Consequently, students had little opportunity to share their own opinion or explain their own thinking because the teacher did not pose questions that facilitate diverse opinions or thinking. When students made errors, no corrections by the teacher were observed. Lack of explanations left students unsure why they are wrong.

[12] Iketani, T. (2009). Lesson analysis of mathematics at upper basic education in Zambia: focusing on verbal interaction between teacher and students. *Journal of International Development and Cooperation*, *15*(1/2), 125-140.

[13] Nakawa, N. (2011). Investigation of students' learning process and the challenges involved: From grade five lessons of number bricks in the Central province of Zambia. *Journal of JASME (Japan Academic Society of Mathematics Education) Research in Mathematics Education, 17*(1), 9-15 (In Japanese)

**Table 4-2 Number and Rate of Teacher's Utterance by Code**

| Code | EP Bukinanyana | EP Rubengera I | EP Buhande | CS Muhe | GS St Rapahel R |
|---|---|---|---|---|---|
| Closed Question | 94 (41.6) | 40 (26.0) | 92 (43.4) | 39 (28.3) | 171 (47.0) |
| Open Question | 3 (1.3) | 2 (1.3) | 0 (0.0) | 1 (0.7) | 2 (0.6) |
| Instruction | 25 (11.1) | 32 (20.8) | 23 (10.8) | 14 (10.1) | 47 (12.9) |
| Confirmation | 0 (0.0) | 15 (9.7) | 22 (10.4) | 29 (21.0) | 22 (6.0) |
| Explanation | 27 (12.0) | 8 (5.2) | 7 (3.3) | 13 (9.4) | 43 (11.8) |
| Ask Agreement | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Point student | 35 (15.5) | 16 (10.4) | 33 (15.6) | 14 (10.1) | 1 (0.3) |
| Encouragement | 9 (4.0) | 15 (9.7) | 12 (5.7) | 12 (8.7) | 10 (2.8) |
| Justification | 20 (8.9) | 8 (5.2) | 19 (9.0) | 15 (10.9) | 48 (13.2) |
| Others | 4 (1.8) | 12 (7.8) | 4 (1.9) | 0 (0.0) | 14 (3.9) |
| Clap | 0 (0.0) | 6 (3.9) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Impossible to listen | 9 (4.0) | 0 (0.0) | 0 (0.0) | 1 (0.7) | 6 (1.7) |
| Total | 226 | 154 | 212 | 138 | 364 |

Figures in parentheses show the percentile rate against total utterances of the lesson.

In order to take a closer look at teachers' questions, BLS extracted open and closed questions and categorized them in four areas in Table 4-3: Presentation of task, asking knowledge and skills, asking how students think, and asking attitude. The result indicated that all or most questions were related to task presentation which give instructions to students. There were only a few questions essential for nurturing mathematical thinking or attitudes. Though teachers tried to deliver learner-centered lessons, the lessons were still teacher-centered.

**Table 4-3 Number and Rate of Teacher's Questions by Category**

| Category | EP Bukinanyana | EP Rubengera I | EP Buhande | CS Muhe | GS St Rapahel R |
|---|---|---|---|---|---|
| Presentation of task | 97 (100.0) | 42 (100.0) | 84 (91.3) | 39 (97.5) | 173 (100.0) |
| Asking knowledge and skills | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Asking how students think | 0 (0.0) | 0 (0.0) | 4 (4.3) | 0 (0.0) | 0 (0.0) |
| Asking attitude | 0 (0.0) | 0 (0.0) | 4 (4.3) | 1 (2.5) | 0 (0.0) |
| Total | 97 | 42 | 92 | 40 | 173 |

Figures in parentheses show the percentile rate against the total questions of the lesson.

# 5 Status of Attained Curriculum

## 5.1 Results of Academic Achievement Tests

This section presents the rates of correct answers (RCA) by questions and histograms of total score for each grade in mathematics and science. The results were examined through t-test method and analysis of variance to assess whether the total scores are statistically different.

It should be noted that some of the P4 students showed difficulties in reading English during lesson observation in the field study. Therefore, question sentences, as well as answer choices were translated into the local language. The RCA and typical wrong answers (TWA), which are the wrong answers that were chosen the most, are detailed in Appendix F.

### 5.1.1 Mathematics

#### (1) P4 level

The AAT for P4 students in mathematics consisted of 33 questions. The RCA by questions are shown in Figure 5-1. Especially, the concept of fractions and decimal numbers had not been acquired by many students (Q11, Q15 and Q16). For example, in a question asking the smallest fraction among four options, 68% of students chose the fraction with the smallest denominator. They likely misinterpreted the smallest denominator for the smallest the fraction.

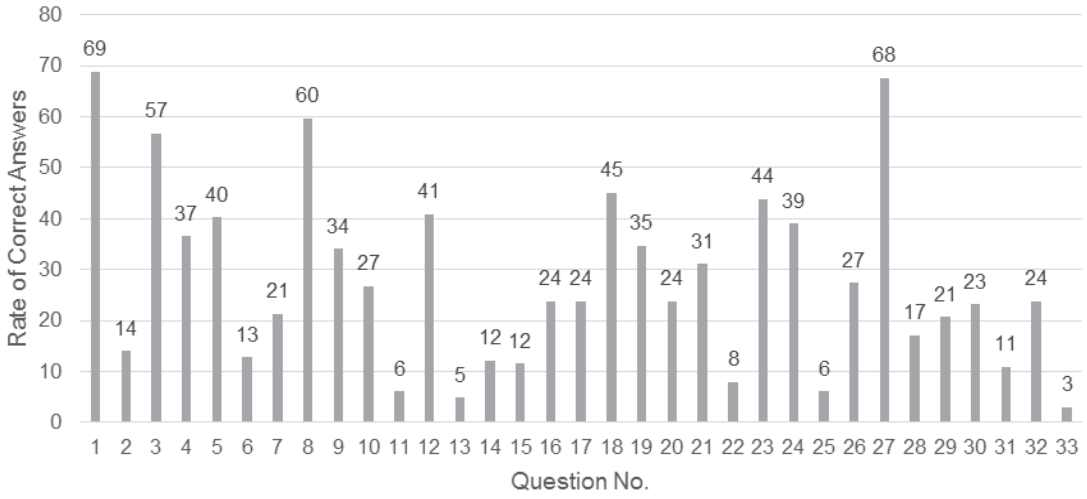



**Figure 5-1 Rate of Correct Answers on P4 Mathematics Test**

The overall average score of EP Buhande and GS Kabuye was 28.0%, which is equivalent to 9.2 correct answers out of 33. The average scores in EP Buhande and GS Kabuye were 15.4% and 29.8%, and the standard deviations (SDs) were 7.8 for EP Buhande and 10.1 for GS Kabuye, respectively. The analysis of variance (ANOVA) method detected statistically significant differences between the average scores of two schools ($F(1, 162)=38.97$, $p<.01$). This means that

the average score of GS Kabuye is scientifically higher than that of EP Buhande. In the Endline survey, this difference from the beginning shall be taken into account when analysing an AAT result. Figure 5-2 below shows the distribution of students' scores for these two schools. It clearly indicates that almost all the students performed poorly in EP Buhande (there were no well-performing students). The survey team noticed that most students in EP Buhande were not able to reach the last question within the allotted time (40 minutes), not only from taking too much time to figure out answers, but also spending considerable time to read the questions even in their local language.

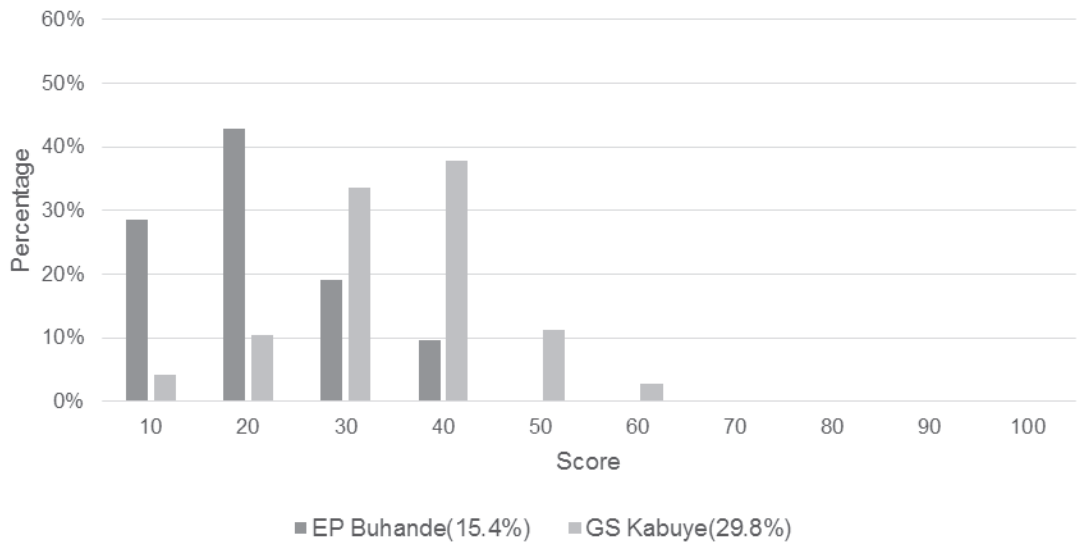



**Figure 5-2 Histogram of Scores for P4 Mathematics Test**

### (2) S1 level

The AAT for S1 students in mathematics consisted of 40 questions. Obviously, there is a noticeable gap in RCA between easy questions and difficult questions as seen in Figure 5-3. Students performed relatively well on questions requiring only simple calculation skills. However, when it comes to questions requiring abstract thinking such as geometry, the RCA were low.

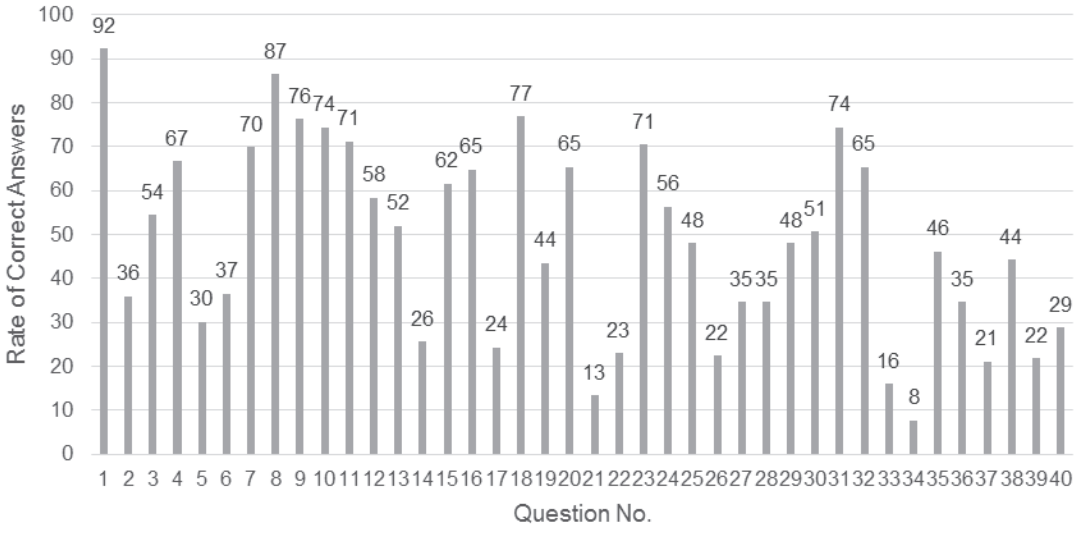



**Figure 5-3 Rate of Correct Answers on S1 Mathematics Test**

The overall average score of GS St Aloys RWG, GS Apagie Musha and LND was 51.4%, which is equivalent to 20.6 correct answers out of 40. The average score was the highest at LND at 55.4% (SD=9.3), followed by GS Apagie Musha at 52.7% (SD=13.4) and GS St Aloys RWG at 48.4% (SD=14.8). There was no significant difference between the average scores out of three schools ($F(2, 153)=3.03$, *n.s.*). It can be said that the level of S1 students' competences in mathematics in the three schools are similar to each other. Figure 5-4 shows the distribution of the students' scores for the three schools.

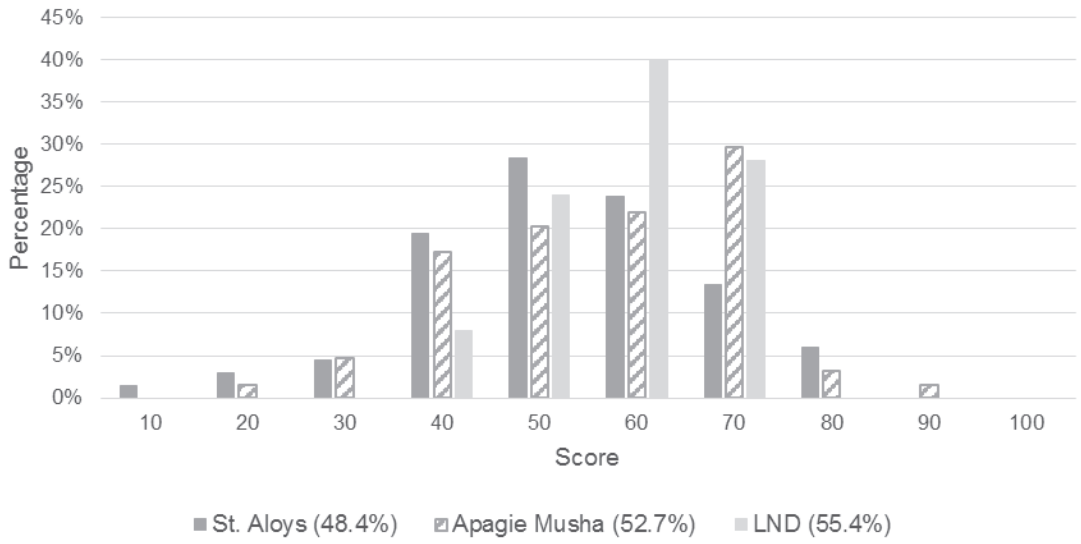



**Figure 5-4 Histogram of Scores for S1 Mathematics Test**

### (3) S4 level

The AAT for S4 students in mathematics consisted of 40 questions (Figure 5-5). Surprisingly, the RCA for some questions which are common in the S1 test remains low, such as Q2, Q13 (Q14 in S1 test), Q17, Q21, Q22, Q26, Q31 (Q34 in S1 test), Q35 (Q37 in S1 test) and Q40. This indicates that students may not have opportunities to review what they learned in lower grades and build on such fundamental knowledge and skills.

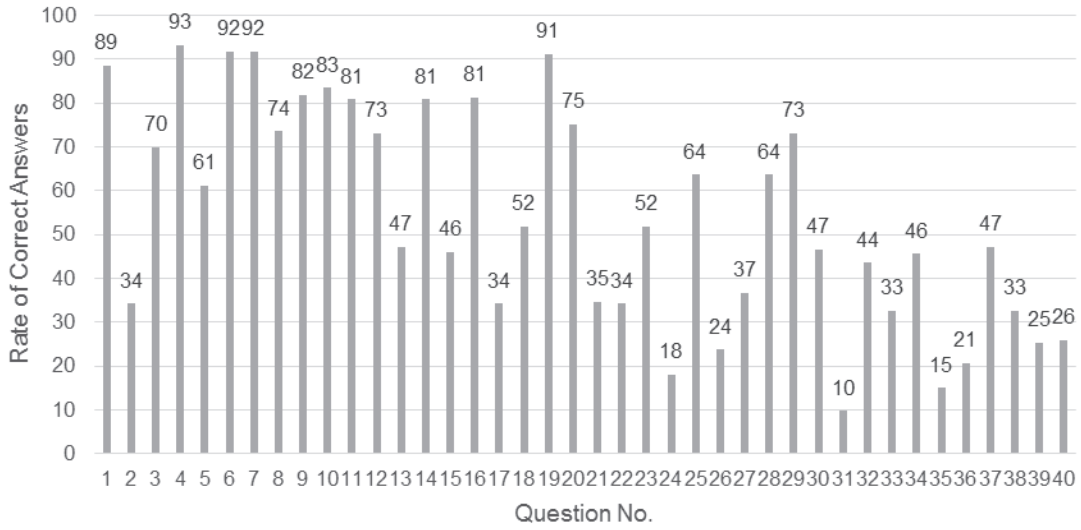



**Figure 5-5 Rate of Correct Answers on S4 Mathematics Test**

The overall average score of GS St Aloys RWG, GS Apagie Musha and LND was 54.4%, which is equivalent to 21.8 correct answers out of 40. Contrary to the result of S1, the average score was the highest at GS St Aloys RWG at 55.3% (SD=14.0), followed by GS Apagie Musha at 54.0% (SD=14.4) and LND at 51.1% (SD=9.6). There was no significant difference between the three schools ($F(2, 190=1.13$, *n.s.*). It can be said that the level of S4 students' competences in mathematics in the three schools are similar too. Figure 5-6 shows the distribution of students' scores for the three schools. The variance is the smallest in LND, where half of the students fall into the score range of 41-50.

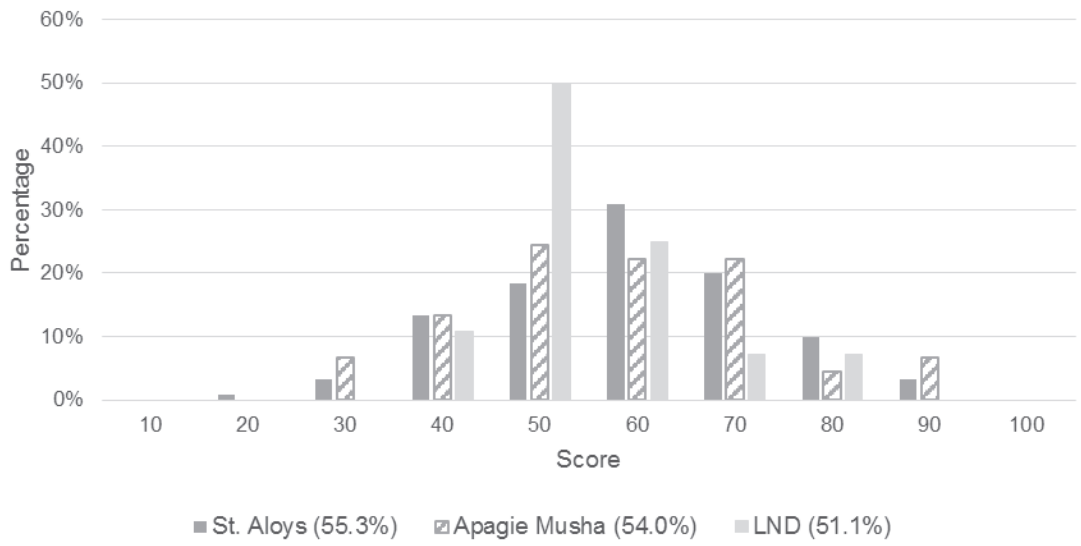



**Figure 5-6 Histogram of Scores for S4 Mathematics Test**

### 5.1.2 Science

#### (1) P4 level

The AAT for P4 students in science consisted of 18 questions (Figure 5-7). It was found that students tended not to choose any option when they thought there was no correct option, and that they performed poorly when the question instructed to choose one wrong option, which were Q2, Q7, Q14 and Q17.

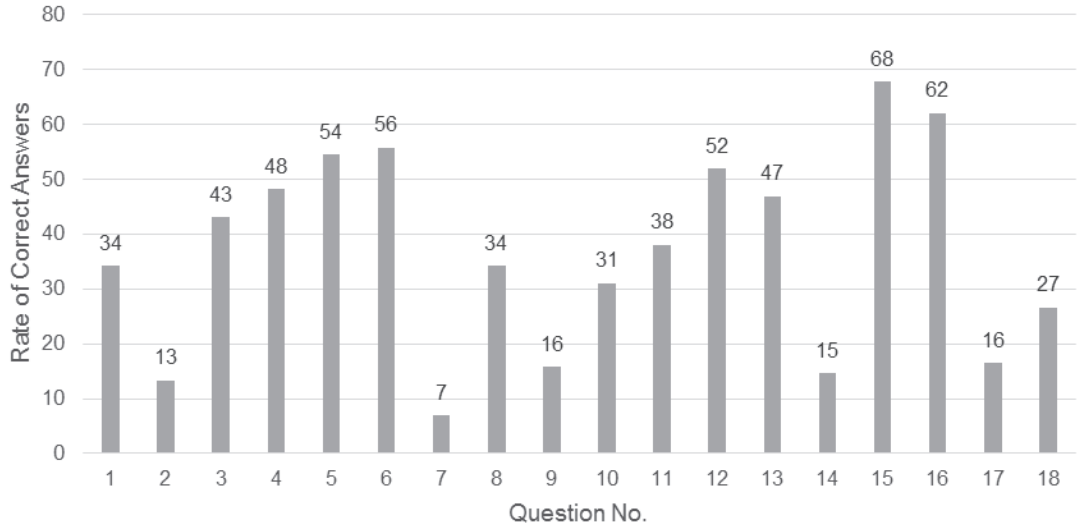



**Figure 5-7 Rate of Correct Answers on P4 Science Test**

The overall average score of EP Buhande and GS Kabuye was 36.7%, which is equivalent to 6.6 correct answers out of 18. EP Buhande performed lower than GS Kabuye, at a score of 23.5% (SD=18.1) and 38.7% (SD=16.7) respectively. There was a significant difference between the two schools ($F(1, 156)=14.49$, $p<.01$). The average score of GS Kabuye is scientifically higher than that of EP Buhande. In the Endline survey, this difference from the beginning shall be taken into account when analysing an AAT result.

The variance of scores is also bigger than mathematics. Figure 5-8 shows the distribution of students' scores for the two schools.

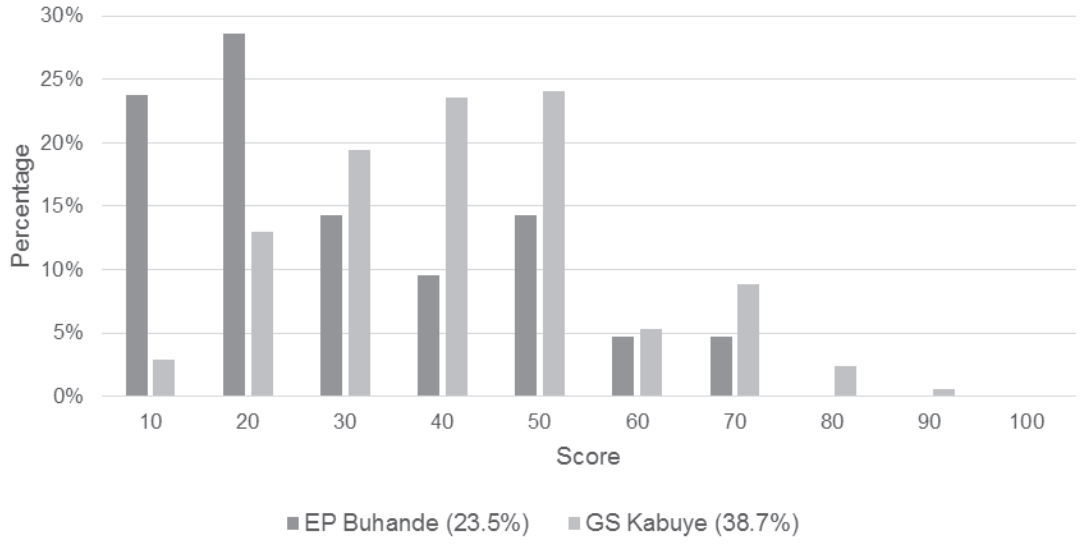



**Figure 5-8 Histogram of Scores for P4 Science Test**

### (2) S1 level

The AAT for S1 students in science consisted of 25 questions (Figure 5-9). For questions taken from the TIMSS 2011, the scores in this AAT were below the international average in seven out of nine questions (Q B3, Q B4, Q B5, Q B6, Q B7, Q B8 and Q B9).

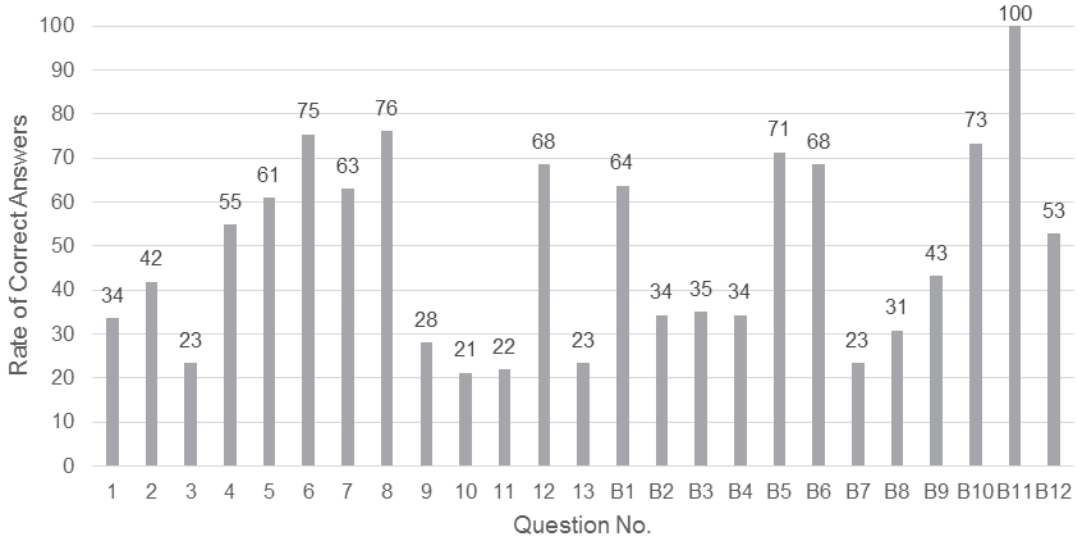



**Figure 5-9 Rate of Correct Answers on S1 Science Test**

The overall average score of GS St Aloys RWG, GS Apagie Musha and LND was 48.9%, which is equivalent to 12.2 correct answers out of 25. The score at GS St Aloys RWG was the highest at 54.0% (SD=13.3), followed by GS Apagie Musha at 46.9% (SD=11.4) and LND at 37.3% (SD=7.4). There was a significant difference between the three schools ($F(2, 143)=16.55$, $p<.01$). Then Holm's multiple comparative analyses method was applied and identified that the average score of GS St Aloys RWG was significantly higher than that of the other two schools. The average score of Apagie Musha was also significantly higher than that of LND. In the Endline survey, this difference from the beginning shall be taken into account when analysing an AAT result. Figure 5-10 shows the distribution of the students' scores for the three schools.

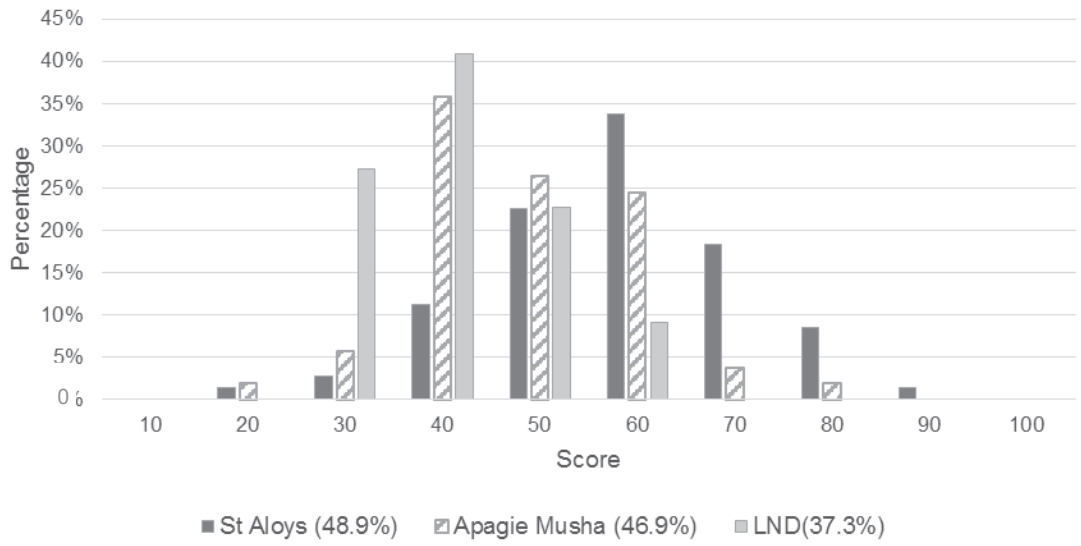



**Figure 5-10 Histogram of Scores for S1 Science Test**

### (3) S4 level

The AAT for S4 students in science consisted of 35 questions (Figure 5-11). The students' performance in this AAT exceeded the international average in 11 out of 19 questions which were picked up from the TIMSS 2011 (Q C3, Q C4, Q C5, Q C6, Q C8, Q C9, Q C10, Q C11, Q C12, Q C13 and Q C15). Questions Q1 to Q13 were the same as in the S1 test. The RCAs for these questions look similar to that of the S1 result, indicating that if students fail to acquire some knowledge and skills, they may never acquire them.

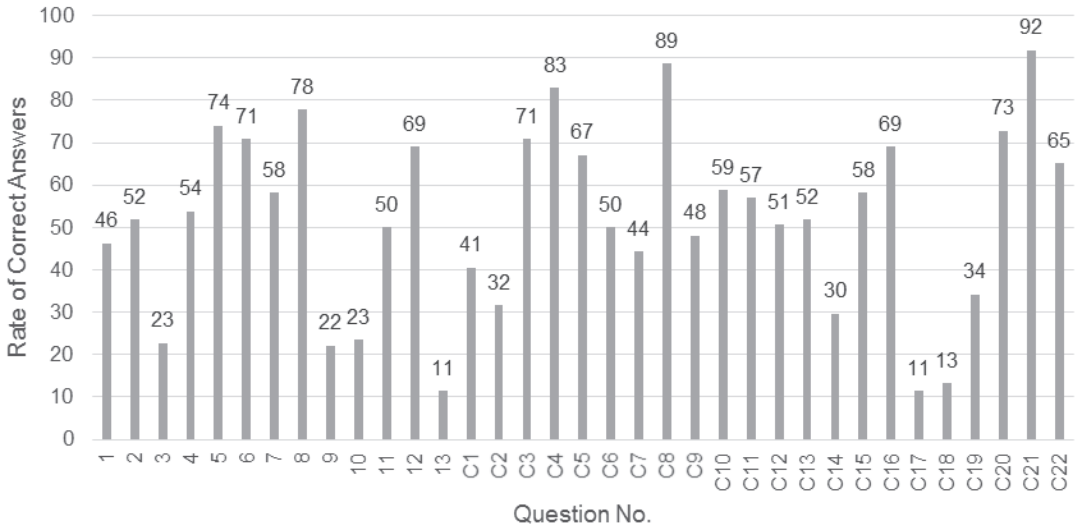



**Figure 5-11 Rate of Correct Answers on S4 Science Test**

The overall average score of GS St Aloys RWG, GS Apagie Musha and LND was 52.0%, which is equivalent to 18.2 correct answers out of 35. Similarly to the result of the S1 test, the average score at GS St Aloys RWG was the highest among the three, at 60.8% (SD=11.3), followed by GS Apagie Musha at 45.6% (SD=14.5) and LND at 39.4% (SD=14.3). ANOVA detected that there was a significant difference between the average scores of three schools ($F(2, 155=36.81$, $p<.01$). Holm's multiple comparative analyses method was then applied and identified that the average score of GS St Aloys RWG was significantly higher than that of the other two schools. The average score of Apagie Musha was also significantly higher than that of LND. In the Endline survey, this difference shall be taken into account from the beginning when analysing an AAT result. Figure 5-12 shows the distribution of students' scores for the three schools.

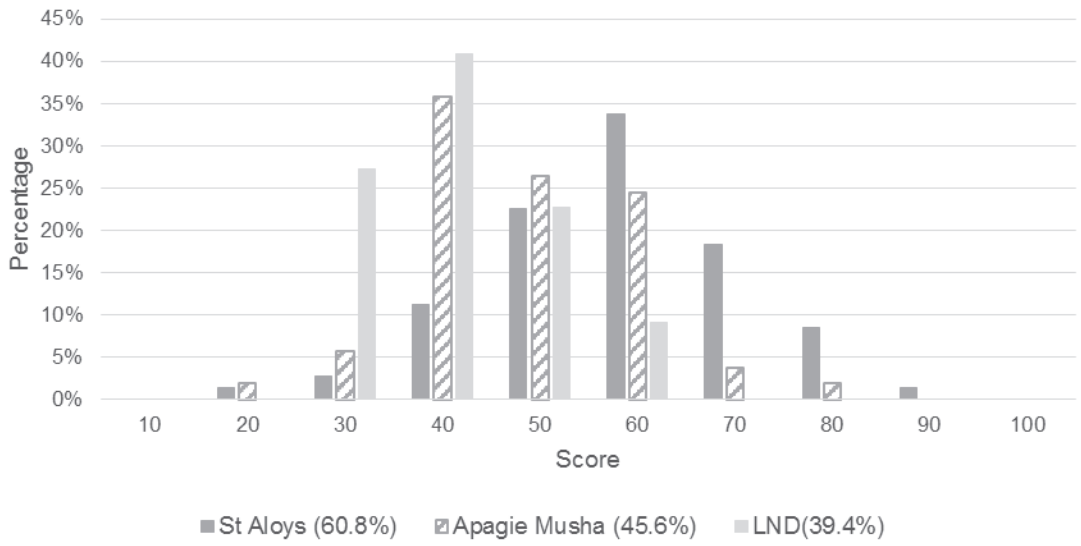



**Figure 5-12 Histogram of Scores for S4 Science Test**

## 5.2 Analysis of Students' Learning

As mentioned earlier, the AATs included questions which students learned in previous grades. In other words, the AATs for S1 students included primary level questions, and S4 included primary level and lower secondary level questions. In order to confirm if the rates improve as grades advance, BLS compared the RCAs for primary level questions among the three grades, and S1 level mathematics questions between S1 and S4. As Table 5-1 shows, there is not a significant improvement in RCAs among the grades. Especially between S1 and S4, the difference is small. It may reflect the fact that the curriculum does not build upon competences in a spiral manner, and hence students do not revisit content in the upper grades again. It also implies that some students just memorize new content without a sound understanding of it due to the lack of basic knowledge and skills.

**Table 5-1 Comparison of Rates of Correct Answers for Primary and S1 Level Questions**

| | P4 | S1 | S4 |
|---|---|---|---|
| Mathematics | 29.3% | 53.9% (Primary level)<br>42.7% (S1 level) | 60.5% (Primary level)<br>43.2% (S1 level) |
| Science | 36.1% | 45.5% | 48.6% |

# 6 Challenges around CBC

This chapter lists the challenges that the BLS has identified through situation analysis, field study and AATs. It includes challenges raised by DCCs. As a part of pilot activities for DCC, the workshops to analyze challenges around students' performance were conducted in four districts; Rulindo, Musanze, Gasabo and Rwamagana. DEOs, SEOs, HTs and representatives from the School General Assembly Committee participated in the workshop. Though challenges analyzed in the workshop were not specific to the new curriculum, some of them were relevant in the current context where CBC is being introduced.

## 6.1 Challenges around intended curriculum

Some DCC members pointed out that it is difficult to complete the syllabus due to a variety of reasons. Some claimed that it was because the double shift which makes it difficult to secure required time to complete the syllabus. Others claimed that there is a gap between expected knowledge and skills that the students in certain grades are supposed to have and what they actually have. If they do not have the expected knowledge and skills, teachers have to review what were taught in the previous grades, which reduces time that teachers have to teach new knowledge and skills. Some said that this was because of automatic promotion, though in some schools, they encourage parents to allow students to repeat the same grade if the attendance or attainment is not considered sufficient.

These challenges hinder effective implementation of the new curriculum, which limits its attainment by students. In the same workshop, DCCs developed action plans to tackle those challenges. They are expected to thoroughly implement the action plan and report the challenges that cannot be solved at the district level to the national level.

## 6.2 Challenges surrounding the implemented curriculum

The perception of teachers' competences varied among the districts. In some districts, DCC members pointed out that teachers do not come to class regularly. According to them, this might be caused by a lack of systematic inspection and monitoring by HT/DOS.

In most of the districts, they concurred that the lack of teaching skills to teach in English was a problem. They wished that SBMs would work better to help teachers enhance their skills on language instruction. According to DCC members, the unsatisfactory performance of SBMs might be caused by a poor selection process. They suggested that the selection criteria set by REB should be applied in a more flexible manner.

Whether teachers are equipped with general pedagogical skills or not varied among the districts. However, those who claimed that teachers were equipped with enough skills also stated challenges around teacher training. The challenges around teacher training were classified into two areas; lack of opportunities and insufficient quality of trainings.

Participants said that the lack of training opportunities should be mitigated by organizing CPD, although the problem around CPD was that teachers are not incentivized by organizing or attending CPD activities. In some districts, they proposed that CPD should be included in imihigo to add extrinsic motivation for CPD. Another reason why CPD is not organized frequently is due to the timetable. It is difficult for teachers to get together for CPD if they have available slots at different times and days of the week. One of the recommendations from the workshop was to encourage HTs to take the time for CPD into account when they make the timetable at the beginning of the academic year.

Insufficient quality of training is a multifaceted problem too. One of the challenges that they pointed out was the lack of post-training assessment. Post-training assessment would help understand whether training was delivered effectively, or whether participants acquired the necessary skills and knowledge. However, currently they barely conduct post-training assessment, so they would never know if the training was effective or if the participants actually learned something in the training. Another challenge was to find a good resource person for trainings. SCC would serve as a platform to exchange information on challenges that each school has and resource persons available in the sector.

## 6.3 Challenges around attained curriculum

The challenges in the intended curriculum and implemented curriculum resulted in a poorly attained curriculum. Although the sample in AATs was not large, the result of AATs revealed that student's performance was not sufficient, especially in primary schools, and that basic knowledge and skills did not improve significantly even when students proceed to upper grades. Taking into account the results of the situation analysis and field study, many schools are likely to face the same challenges more or less. These challenges make it difficult for teachers to develop students' HOT as well. Teachers have struggled to develop proper questions which fit the individual students and practice active learning.

# 7 Recommendation

In order to strengthen implementation of CBC based lessons in classrooms through SBI or CPD activities, the following recommendations should be taken into consideration.

- Training for the administrative stream is important to make sure that trainings are conducted in a timely manner and to ensure that all teachers are trained. As of July 2017, most of the sectors have not yet organized the phase II CBC trainings. Absence of an administrative stream in the original plan of CBC training for Phase II resulted in a significant delay of implementation of the last layer of cascade training at sector-based trainings. Besides, there are some teachers who have not attended CBC training fully or completely. Survey results from BLS suggest that training administrators is important in making sure all teachers attend CBC trainings.
- New teachers who graduated from Teacher Training Colleges (TTCs) in 2016 and 2017 have not been fully trained in CBC. These new teachers need support from their colleagues at the school level to deliver lessons according to the CBC. SBI can serve as a platform to give continuous support for them.
- Stronger involvement of SBM and SSL is expected in phase III of CBC training to make the most of these resource persons available at the school level. At the same time, it should be noted that the role that SBM and SSL can play is different according to the school settings.
- Subject specific contents were barely covered in the previous phases of CBC trainings. Selection criteria of SBTs did not include subject knowledge. Consequently, it was observed that too much emphasis was placed on some methodologies, such as group work and play-based learning, and some students failed to master foundational knowledge and skills which are prerequisites for students to engage in critical and creative thinking. Since the main theme of the phase III CBC training will be on assessment, training content should focus on questioning, formative and summative assessment, as well as past content which teachers have not acquired well.
- Training output (implementation and participation status) and outcome (comprehension level of teachers) were not evaluated. How to assure the quality of trainings (for example by conducting post-training tests for all levels of cascade trainings) should be considered in the Phase III CBC training.
- Literature argues that provision of many ad-hoc, one-off trainings has resulted in the inefficient use of teachers' valuable time and inequality of training opportunities among teachers (Mulkeen, 2010[14]). Therefore, it is critical to institutionalize school based CPD at schools and monitor activities. The establishment and operationalization of DCCs and

[14] Mulkeen, A. (2010). *Teachers in Anglophone Africa: Issues in teacher supply, training, and management.* Washington, DC: The World Bank.

SCCs is highly important so that these organizations can coordinate and continuously monitor CPD activities near where teaching and learning takes place. If DCCs and SCCs can function well, the problem solving cycle from school level to national level can work as well.

- Online monitoring has not yet started functioning fully due to the lack of capacity and practice of SEOs, which makes it difficult to understand the implementation and participation status of CBC training at the national level. “How to use online monitoring” should be one of the topics to be covered in the phase III CBC training. This will enable REB, districts and sectors to understand the CBC training implementation status and teachers’ participation in the training more comprehensively.

# Appendices

# Appendices A
# Questionnaire to Head Teachers

# Appendix A

## Questionnaire to Head Teachers

This is the questionnaire for end line survey for SIIQS Project. This questionnaire is NOT for your professional performance assessment so please provide honest information.

## 1. Basic Information

1.1 School Name: _____

1.2 Sector: _____ 1.3 District: _____

1.4 Type of School: Primary / 9YBES / 12YBES / SS

1.5 Type of ownership: Public / Government-aided / Private

1.6 Your Name:_____ _____ _____
(surname) (given name) (middle name)

1.7 Male or Female: M F 1.8 Age: _____ years old

1.9 Tel: _____ 1.10 E-mail: _____

1.11 Experience: (a) Head teacher: _____ years (b) In total: _____ years

1.12 Qualification: A0 / A1 / A2 / Others

1.13 Number of teachers in your school

| | | Male | Female | Total |
|---|---|---|---|---|
| Primary | Qualified | | | |
| | Non qualified | | | |
| Secondary | Qualified | | | |
| | Non qualified | | | |

1.14 Number of mathematics and science teachers in your school

| | | Male | Female | Total |
|---|---|---|---|---|
| Mathematics | Qualified | | | |
| | Non qualified | | | |
| Science | Qualified | | | |
| | Non qualified | | | |

1.15 Number of students

| Grade | Classes | No of Students | | | No of repeaters | | | No of drop-outs | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Boy | Girl | Total | Boy | Girl | Total | Boy | Girl | Total |
| P1 | | | | | | | | | | |
| P2 | | | | | | | | | | |
| P3 | | | | | | | | | | |
| P4 | | | | | | | | | | |
| P5 | | | | | | | | | | |
| P6 | | | | | | | | | | |
| S1 | | | | | | | | | | |
| S2 | | | | | | | | | | |
| S3 | | | | | | | | | | |
| S4 | | | | | | | | | | |
| S5 | | | | | | | | | | |
| S6 | | | | | | | | | | |
| Total | | | | | | | | | | |

1.16 Do you have the following resources? How many do you have?

| | | | | |
|---|---|---|---|---|
| a. Curriculum book | 1. for all teachers | 2. for some teachers | 3. for few teachers | 4. none |
| b. Syllabus | 1. for all subjects | 2. for some subjects | 3. for few subjects | 4. none |
| c. Textbooks | 1. for all subjects | 2. for some subjects | 3. for few subjects | 4. none |

1.17 Available Facilities /Equipments

| | Y | N | | Y | N | How many? |
|---|---|---|---|---|---|---|
| Library | | | PC for teachers in use | | | |
| Internet access | | | PC for students in use | | | |
| Science laboratory | | | | | | |
| Computer laboratory | | | | | | |

1.18 What are the major issues on your school management? Please specify in the box below.

## 2. Competence-Based Curriculum (CBC)

2.1 How much do you think your teachers change lesson style when conducting CBC?

0. none 1. slightly 2. moderate 3. very much

2.2 Did SSLs at your school organize the **school-based CBC induction training** last year?

1. Yes, SSLs fully conducted
2. Yes, SSLs partly conducted
3. No, SSLs missed all or most of it.
4. SSLs did not organize it

➔ If SSLs conducted the school-based CBC induction training, please assess the training quality with the following criteria.

| | | | |
|---|---|---|---|
| a. Attendance: | 1. all teachers attended | 2. some teachers missed | 3. most teachers missed |
| b. Coverage: | 1. all topics were covered | 2. some topics were missed | 3. most topics were missed |
| c. Understanding: | 1. fully understood | 2. fairly understood | 3. poorly understood |

➔ Please choose the criteria of the appointment for SSLs when you appointed them last year. (multiple choices are allowed)

1. English skill 2. Leadership 3. Subject knowledge 4. Pedagogical knowledge
5. Position 6. Seniority 7. Teaching experience 8. Inter personal skill
9. Personality 10. Commitment 11. Recommendation from other teachers
12. No other choice (He/She is the only teacher in the subject) 13. Not appointed

➔ If you have not appointed SSL, please specify the reason of it.

Because:

2.3 Please specify the issues and challenges on the school-based CBC induction training.

## 3. School-Based In-Service Training (SBI)

3.1 Does your school conduct SBI regularly? (apart from the CBC induction training)

0. never 1. once a term 2. twice a term 3. three times or more a term

➔ What are the benefits of the SBI for you? (Multiple choices are allowed)

1. Develop teachers 2. Improving lessons 3. Cost effective
4. Enjoyable 5. Sharing practical ideas 6. Easy to conduct
7. Other (Please specify: _____)

➔ How many times did your school conduct SBI(s) in this term? (1st term of 2017)

0. never 1. once 2. twice 3. three times or more

3.2 If your school conduct SBI in this term, please specify the theme/topic of the SBI(s)

| |
|---|
| |

3.3 If your school did not conduct SBI in this term, please specify the reason.

| |
|---|
| |

## 4. School-Based Mentor (SBM)

4.1 Did you appoint School-Based Mentor (SBM)?

1. Appointed 2. Not appointed yet

➔ If you appointed SBM, please choose the criteria of the appointment (multiple choices are allowed)

1. English skill 2. Leadership 3. Subject knowledge 4. Pedagogical knowledge
5. Position 6. Seniority 7. Teaching experience 8. Inter personal skill
9. Personality 10. Commitment 11. Recommendation from other teachers

➔ Did you reduce the number of teaching periods of the SBM to handle SBM's tasks?

1. Yes 2. No

What is his/her teaching periods?

BEFORE: _____periods NOW: _____periods

➔ If you have not appointed SBM, please specify the reason of it.

| Because: |
|---|
| |

# Appendices B
# Questionnaire to School Teachers

# Appendix B

## Questionnaire to School Teachers

This is the questionnaire for the survey of the SIIQS Project which aims at strengthen training program for in-service teachers. This questionnaire is NOT for your professional performance assessment but for SIIQS program improvement, so please provide honest information.

## 1. Basic Information

1.1 School Name: _____

1.2 Sector: _____ 1.3 District: _____

1.4 Your Name:_____ _____ _____
(surname) (given name) (middle name)

1.5 Male or Female: M F 1.6 Age: _____ years old

1.7 Tel: _____ 1.8 E-mail: _____

1.9 Teaching Experience: (a) In this school: _____ years (b) In total: _____ years

1.10 Qualification: A0 / A1 / A2 / Others

1.11 Level of students you are teaching this term (multiple choices are allowed)
P1 / P2 / P3 / P4 / P5/ P6/ S1 / S2 / S3 / S4 / S5/ S6

1.12 Subject you are teaching in this term:_____

1.13 Your department in school: _____

1.14 (a) Are you a School-based Mentor (SBM)? Yes / No
(b) Are you a School Subject Leader (SSL)? Yes / No

1.15 How many periods do you teach **per week** in this term? _____periods/week

1.16 **In a typical school week**, estimate the total number of hours in week you spend on the following. Please write 0 (zero) if none.

(a) Individual planning or preparation of lessons in school ____. hours/week

(b) Individual planning or preparation of lessons out of school ____. hours/week

(c) Team work and dialogue with colleagues within this school ____. hours/week

(d) Marking/correcting of student work either in school or out of school ____. hours/week

(e) Extracurricular activities (e.g. sports and cultural activities after class) ____. hours/week

(f) Administrative duties either in school or out of school ____. hours/week

## 2. Competence-Based Curriculum (CBC)

2.1 (Question about Knowledge on CBC): Which of the below grade(s) CBC is being implemented this year? Please circle grade(s) (multiple choices are allowed).

Pre-primary / P1 / P2 / P3 / P4 / P5 / P6 / S1 / S2 / S3 / S4 / S5 / S6

2.2 Circle the document(s) that you have in your school (multiple choices are allowed).

1. Curriculum book
2. Syllabus of the subject(s) you are teaching
3. Textbook of the subject(s) and grades you are teaching
4. None

2.3 How much did you change your lesson style when conducting CBC?

0. never
1. slightly
2. moderate
3. very much

2.4 Please circle the number from 1 to 4 which most fits your opinion about CBC.

| | | Strongly disagree | Disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| (a) | I am ready to conduct the CBC lesson. | 1 | 2 | 3 | 4 |
| (b) | CBC is difficult for teachers. | 1 | 2 | 3 | 4 |
| (c) | CBC is difficult for students. | 1 | 2 | 3 | 4 |
| (d) | Students' capacity is too low to conduct CBC lesson. | 1 | 2 | 3 | 4 |
| (e) | Teachers are not provided enough training to conduct CBC lesson. | 1 | 2 | 3 | 4 |
| (f) | Teachers are not provided enough learning/teaching material to conduct CBC lesson. | 1 | 2 | 3 | 4 |
| (g) | CBC requires more time for lesson preparation than before. | 1 | 2 | 3 | 4 |
| (h) | I can organize learning/teaching activities required in CBC lessons. | 1 | 2 | 3 | 4 |
| (i) | I can prepare learning/teaching materials required in CBC lessons. | 1 | 2 | 3 | 4 |
| (j) | I can conduct assessment techniques to evaluate learner's achievement in CBC lessons. | 1 | 2 | 3 | 4 |
| (k) | All CBC lessons have to include collaborative learning activity. | 1 | 2 | 3 | 4 |
| (l) | CBC is a better curriculum than the previous one. | 1 | 2 | 3 | 4 |
| (m) | I can develop competence of students. | 1 | 2 | 3 | 4 |

2.5 Did you attend the **school-based CBC induction training** that SSLs conducted for teachers in your school last year?

1. Yes, I fully attended
2. Yes, I partly attended
3. No, I missed all or most of it.
4. My school did not organize it

➔ If your answer to Question 2.5 is "1" or "2", please proceed to the questions in next page.
➔ If your answer to Question 2.5 is "3" or "4", please specify the reason in the box below.

Because:

2.6 **(For those attended school-based CBC induction training only)**

Do you remember if the last CBC induction training covered the following topics? If so, what positive impact did these have on your CBC practice? For each topics please indicate 'Yes' or 'No' in part (A). If 'Yes' in part (A), please estimate the impact in part (B).

| | | (A) Topics | | (B) Impact | | | |
|---|---|---|---|---|---|---|---|
| | | Yes | No | No impact | A small impact | A medium impact | A large impact |
| (a) | Background and Rationale of the New Curriculum | Y | N | 1 | 2 | 3 | 4 |
| (b) | Concept of Competences | Y | N | 1 | 2 | 3 | 4 |
| (c) | How to develop competences | Y | N | 1 | 2 | 3 | 4 |
| (d) | Techniques used in developing competences | Y | N | 1 | 2 | 3 | 4 |
| (e) | Assessment methodology in CBC | Y | N | 1 | 2 | 3 | 4 |
| (f) | Teaching resources for CBC | Y | N | 1 | 2 | 3 | 4 |
| (g) | CBC unit Planning/Scheme of Work development | Y | N | 1 | 2 | 3 | 4 |
| (h) | CBC lesson Planning | Y | N | 1 | 2 | 3 | 4 |
| (i) | Learning environment management | Y | N | 1 | 2 | 3 | 4 |
| (j) | Inclusive education | Y | N | 1 | 2 | 3 | 4 |
| (k) | Continuous Professional Development (CPD) | Y | N | 1 | 2 | 3 | 4 |
| (l) | School-Based In Service training (SBI) | Y | N | 1 | 2 | 3 | 4 |
| (m) | National CBC monitoring and evaluation mechanism | Y | N | 1 | 2 | 3 | 4 |

2.7 What challenges do you have in implementing CBC?

## 3. School-based In-Service Training (SBI)

3.1 Does your school conduct SBI regularly (apart from the CBC induction training)?

0. never 1. once a term 2. twice a term 3. three times or more a term

3.2 How many times did you attend the SBI in this term? (1st term of 2017)

0. never 1. once 2. twice 3. three times or more

➔ If your answer to Question 3.2 is "1", "2" or "3", please specify the theme/topic of the SBI(s)

3.3 Please circle the number from 1 to 4 which most fits your opinion about SBI.

| | | Strongly disagree | Disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| (a) | I understand well about SBI. | 1 | 2 | 3 | 4 |
| (b) | SBI is effective in improving teaching and learning. | 1 | 2 | 3 | 4 |
| (c) | I think that we can continue doing SBI for a long time. | 1 | 2 | 3 | 4 |
| (d) | Allowance should be paid for participants in SBI. | 1 | 2 | 3 | 4 |
| (e) | SBI is burdensome (heavy task). | 1 | 2 | 3 | 4 |

## 4. Training needs

4.1 Please indicate the degree to which you currently need training for each areas listed below.

| | | No need | Low level of need | Moderate level of need | High level of need |
|---|---|---|---|---|---|
| (a) | Knowledge and understanding of my subject field(s) | 1 | 2 | 3 | 4 |
| (b) | Knowledge of the CBC curriculum | 1 | 2 | 3 | 4 |
| (c) | Skills of English as an instructional language | 1 | 2 | 3 | 4 |
| (d) | Teaching methodology in teaching my subject field(s) | 1 | 2 | 3 | 4 |
| (e) | Teaching methodology to develop students' competences | 1 | 2 | 3 | 4 |
| (f) | Teaching methodology in large size classroom | 1 | 2 | 3 | 4 |
| (g) | Teaching methodology to teach cross-cutting issues | 1 | 2 | 3 | 4 |
| (h) | Teaching methodology to promote play-based learning | 1 | 2 | 3 | 4 |
| (i) | Student evaluation and assessment practices | 1 | 2 | 3 | 4 |
| (j) | ICT skills for teaching | 1 | 2 | 3 | 4 |
| (k) | Teaching students with special needs | 1 | 2 | 3 | 4 |
| (l) | Teaching in a multicultural or multilingual setting | 1 | 2 | 3 | 4 |
| (m) | Student career guidance and counseling | 1 | 2 | 3 | 4 |

## 5. Performance Contract (Imihigo)

5.1 Have you made your imihigo for this year? Yes / No

5.2 Describe the target(s) that you set in your imihigo.

## 6. School Environment / Facility

6.1 Do you use a computer, smartphone or tablet to collect useful information when preparing lessons?

1. Always 2. Frequently 3. Occasionally 4. Never 5. I have no internet

➔ If your answer to Question 6.1 is "1", "2" or "3", choose the mode(s) through which you access internet (Multiple choices are allowed)

1. Computer 2. Smartphone 3. Tablet

6.2 Have you used "Teacher Community of Practice" (TCOP)?

1. Yes, I often use it
2. Yes, I have seen it.
3. No, I haven't, but I heard about it.
4. No, I haven't.

## 7. Perception on School Management

7.1 Please circle the number from 1 to 5 which most fits your opinion.

| | | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|---|
| 1 | I am proud of teaching profession. | 1 | 2 | 3 | 4 | 5 |
| 2 | I want to continue teaching profession even if my tasks would become harder than now. | 1 | 2 | 3 | 4 | 5 |
| 3 | I cannot carry out a good lesson because teachers' salary is low. | 1 | 2 | 3 | 4 | 5 |
| 4 | The number of lessons per week is too much. | 1 | 2 | 3 | 4 | 5 |
| 5 | I cannot properly prepare lessons because of too many administrative duties. | 1 | 2 | 3 | 4 | 5 |
| 6 | I enjoy working with my colleagues in my school. | 1 | 2 | 3 | 4 | 5 |
| 7 | My head teacher is supportive in improving teaching and learning in my school. | 1 | 2 | 3 | 4 | 5 |
| 8 | (O and A level only) Director of Study (DoS) in my school is supportive in improving teaching and learning in my school. | 1 | 2 | 3 | 4 | 5 |
| 9 | School-based Mentor (SBM) in my school helps me improve my lesson. | 1 | 2 | 3 | 4 | 5 |
| 10 | School Subject Leader (SSL) in my school helps me improve my lesson. | 1 | 2 | 3 | 4 | 5 |
| 11 | I often receive advice/consultation from my colleagues to improve my teaching. | 1 | 2 | 3 | 4 | 5 |
| 12 | I often give advice/consultation to my colleagues to improve their teaching. | 1 | 2 | 3 | 4 | 5 |
| 13 | I am willing to share my good lesson practice with my colleagues. | 1 | 2 | 3 | 4 | 5 |
| 14 | I use the feedback/advice given by my colleague to improve my teaching and learning process. | 1 | 2 | 3 | 4 | 5 |
| 15 | School activities are proceeded as planned in my school. | 1 | 2 | 3 | 4 | 5 |
| 16 | There is atmosphere in my school to make challenges for new idea positively. | 1 | 2 | 3 | 4 | 5 |
| 17 | Results from national examination are analyzed by all teachers together. | 1 | 2 | 3 | 4 | 5 |
| 18 | I usually contact to my students' parents/guardians from my side to talk about students' performance. | 1 | 2 | 3 | 4 | 5 |
| 19 | My students' parents/guardians contact me from their side to talk about students' performance. | 1 | 2 | 3 | 4 | 5 |
| 20 | The vision/mission of my school is/are clearly stated. | 1 | 2 | 3 | 4 | 5 |
| 21 | The vision/mission of my school is shared within school community members. | 1 | 2 | 3 | 4 | 5 |
| 22 | I make my effort to attain the vision/mission of my school. | 1 | 2 | 3 | 4 | 5 |
| 23 | There are clear aims or objectives in my school. | 1 | 2 | 3 | 4 | 5 |
| 24 | The objectives and plans are achieved successfully in my school. | 1 | 2 | 3 | 4 | 5 |
| 25 | Objectives and plans are developed based on evidence and data in my school. | 1 | 2 | 3 | 4 | 5 |
| 26 | The school leaders encourage us to give some comments/ ideas to contribute school improvement. | 1 | 2 | 3 | 4 | 5 |
| 27 | There is cooperative system among different subjects in my school. | 1 | 2 | 3 | 4 | 5 |
| 28 | My opinions often contribute to the process of making decision in my school. | 1 | 2 | 3 | 4 | 5 |
| 29 | (For those who are not SBM only) I want to be an SBM | 1 | 2 | 3 | 4 | 5 |
| 30 | (For those who are not SSL only) I want to be an SSL | 1 | 2 | 3 | 4 | 5 |

Thank you for your cooperation.

# Appendices C
# Interview Record Sheet
# for Semi-Structured Interview
# for Head Teachers

# Appendix C

**Interview Record Sheet for Semi-Structured Interview for *HT***

| | |
|---|---|
| **Date** | |
| **School Name** | |
| **Type of School (Circle one)** | Primary 9YBES 12YBES SS |
| **Name of the Interviewer** | |
| **Name of the Recorder** | |

**Topic 1: Overall impression on CBC**

**(1) How do you like CBC? Why? How do you assess the performance of teachers as for CBC implementer?**

**(2) How did you organize the school-based CBC induction training last year? How did you organize training? Was it on weekday? How long did you spend the time for that training? Where was the venue?**

**(3) What are the major problems on CBC implementation at your school? (Particularly in math and science) Have you ever shared /reported the challenges to someone (HT/SEO)? What training do you need for further CBC improvement?**

**Topic 2: SBI**

**(1) Does your school conduct SBI? If yes, how do you like it? What were the themes of SBI so far? Were the objectives fulfilled? Do you think SBI is effective in improving teaching and learning? If no, what is the reason?**

**(2) Did you appoint SBM and SSLs? What do they do? How do they help SBI or CBC? Is SBM and SSLs given free time to organize mentoring or SBI?**

**(3) What sort of SBI are you planning? What SBI do you want to have in the further?**

**(4) Are there any challenges in conducting SBI? Do you think SBI is sustainable in your school? Do you use capitation grant (how much?) for SBI? Do you think SBI should have financial support? Have you ever reported the challenges to SEO to solve?**

**Topic 3: Performance contract**

**(1) How do you prepare school imihigo and personal imihigo?Are there any targets related to SBI/CBC in your performance contract (Imihigo)?**

**(2) How did you set the target? Do you have any reference document? Do you think CBC/SBI quality improvement can be your imihigo target?**

**Topic 4: General Problems, Request to REB, Willingness to work with us.**

**(1) Are there any other issues or problems on your school to be reported to REB on this occasion? Are such problems shared among teachers to overcome the issues?**

**(2) What are the advantages, good points of your school? What are the visions of your school? Are such visions shared among teachers to achieve goals? Do you want to work with us as a model school to improve the lessons even without financial support?**

# Appendices D
# Interview Record Sheet
# for Semi-Structured Interview
# for Group of Teachers

# Appendix D

**Interview Record Sheet for Semi-Structured Interview for Group of *Teachers***

| | |
|---|---|
| **Date** | |
| **School Name** | |
| **Type of School (Circle one)** | Primary 9YBES 12YBES SS |
| **Name of the Interviewer** | |
| **Name of the Recorder** | |
| **Number of Participants** | |

**Topic 1: Overall impression on CBC**

**(1) Did you attend school-based CBC induction training that SSLs conducted for teachers in your school last year? How was the training? How long was it? Were you fully involved?**

**(2) What do you think CBC? Do you like it or not? Why? What are the major problems on CBC implementation at your school? (Particularly in math and science) Have you ever shared /reported the challenges to someone (HT/SEO)?**

**(3) What training do you need for further CBC improvement?**

**Topic 2: SBI**

**(1) Does your school conduct SBI? If yes, how do you like it? What were the themes of SBI so far? Were the objectives fulfilled? Do you think SBI is effective in improving teaching and learning? If no, what is the reason?**

**(2) What sort of SBI are you planning? What SBI do you want to have in the further?**

**(3) Are there any challenges in conducting SBI? Do you think SBI is sustainable in your school? Do you think SBI should have financial support?**

**Topic 4: General Problems, Request to REB, Willingness to work with us**

**(1) Are visions of your school shared among teachers to achieve goals? Are there good practices or problems on your school to be reported to REB on this occasion? Are such problems shared among teachers to overcome?**

**(2) Do you want to work with us as a model school to improve the lessons even without financial support?**

# Appendices E
# Academic Achievement Test

# Appendix E

# Academic Achievement Test

## JICA SIIQS Project

## Mathematics Test for Primary School Students (P4)

Name: First Name:_____ Middle Name: _____ Last Name:_____

School: _____ Class: _____ Student Number: _____

***** Sample **********

Calculate 2 + 5 =

A. 0

✓B. 7

C. 10

D. 3

Circle or ✓ here.

Choose only one answer.

**********

1. 7 + 2 = ☐

A. 5 B. 72 C. 9 D. 27

2. The digit in the thousand's place in 72081 is …

A. 7 B. 2 C. 0 D. 8

3. Calculate : $8 \times 7$

A. 42 B. 49 C. 56 D. 15

4. Add :
$$\begin{array}{r} 1\ 4 \\ +\quad 7 \\ \hline \\ \hline \end{array}$$

A. 7 B. 11 C. 21 D. 111

5. Calculate : 10 – 2 + 5

A. 3 B. 7 C. 13 D. 17

6. Multiply : $302 \times 50$

A. 1600 B. 16000 C. 1510 D. 15100

7. Divide : $276 \div 4$

A. 59 B. 69 C. 79 D. 64

8. Add : 597 + 236

A. 733 B. 833 C. 823 D. 723

9. Subtract : 600 – 236

A. 264 B. 374 C. 464 D. 364

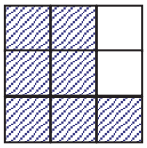
10. What fraction of the diagram below is shaded?

A. $\frac{7}{2}$

B. $\frac{9}{7}$

C. $\frac{7}{9}$

D. $\frac{2}{7}$



11. Which of the following fractions is the smallest? $\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}$.

A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$

12. Calculate : $\frac{2}{7}+\frac{3}{7}$

A. $\frac{6}{7}$ B. $\frac{5}{14}$ C. $\frac{5}{7}$ D. $\frac{8}{7}$

13. Simplify : $\frac{2}{5}\times\frac{3}{4}$

A. $\frac{3}{10}$ B. $\frac{3}{5}$ C. $\frac{5}{9}$ D. $\frac{8}{15}$

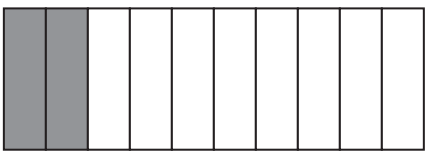
14. $\frac{4}{6}-\frac{1}{6}=\mathrm{m}$, m is …

A. $\frac{1}{3}$ B. $\frac{1}{9}$ C. $\frac{1}{18}$ D. $\frac{1}{2}$

15. Which of the following is equal to 0.4?

A. 4 B. $\frac{4}{10}$ C. $\frac{4}{100}$ D. $\frac{1}{4}$

16. Which decimal number does the following shaded part express?



A. 2.8 B. 0.5 C. 0.2 D. 0.02

17. Change $\frac{123}{100}$ to a decimal number.

A. 0.23 B. 1.023 C. 1.23 D. 12.3

18. Calculate: 0.23 + 1.37

A. 0.7 B. 1.7 C. 1.6 D. 1.5

19. Calculate: $19.82 - 5.28$

A. 14.64 B. 14.54 C. 14.66 D. 14

20. Change 1.25 metres to centimetres.

A. 12.5 cm B. 125 cm C. 1250 cm D. 102.5 cm

21. Emmanuel gets 0.5 litres of tomato juice from 5 tomatoes. How many litres of the juice can he get from 15 tomatoes?

A. 1.5 litres B. 2 litres C. 2.5 litres D. 3 litres

22. A book contains 130 pages. Claudine read 78 pages of it. Which of the following shows the rest of the pages left?

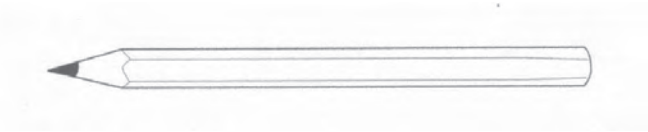
A. 130 + 78 = ☐

B. ☐ – 78 = 130

C. $130 \div 78 =$ ☐

D. 130 – 78 = ☐

23. About how long is this picture of a pencil?



A.5 cm B. 10 cm C. 20 cm D. 30 cm

24. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6?

A. 12 B. 15 C. 18 D. 21

25. Find the collect sign to compare the following number.

Seven hundred ☐ 617 + 83

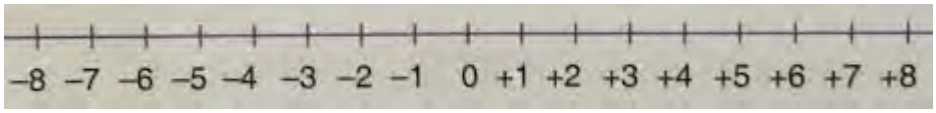
A. =

B. >

C. <

D. None of the above

26. What is the distance between -3 and +6 on the number line?




A. 3 B. 9 C. -3 D. -9

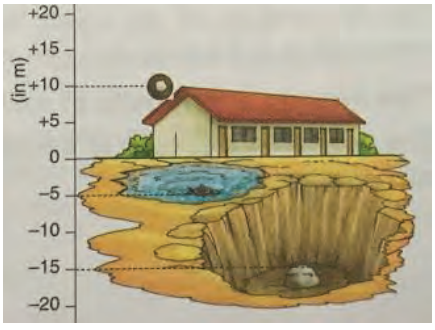
27. Study the diagram below and find the position of the top of the roof.

A. -5 m

B. 0 m

C. +5 m

D. +10 m



28. Find the LCM of 12 and 15

A. 3 B. 27 C. 60 D. 180

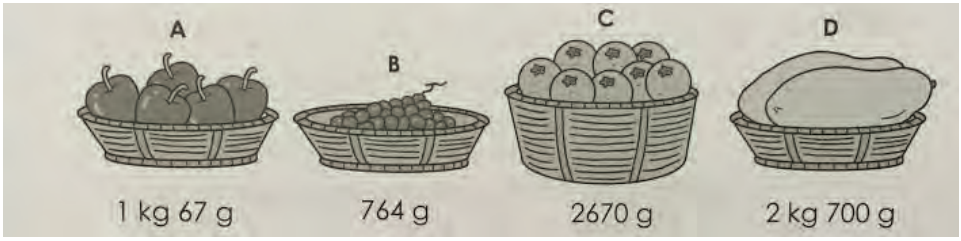
29. Evaluate $\sqrt{16}$

A. 3 B. 16 C. 4 D. 8

30. Calculate 5 m 25 cm – 1 m 40 cm

A. 4 m 15 cm B. 6 m 65 cm C. 4 m 65cm D. 3 m 85 cm

31. Find the correct answer.



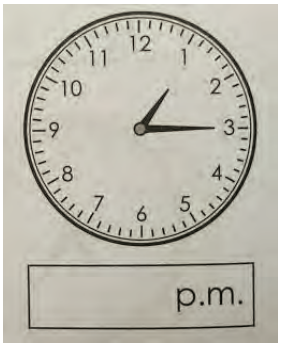

A. Basket A is the lightest.

B. Basket C is the heaviest.

C. Basket A is lighter than Basket B

D. Basket D is heavier than Basket C

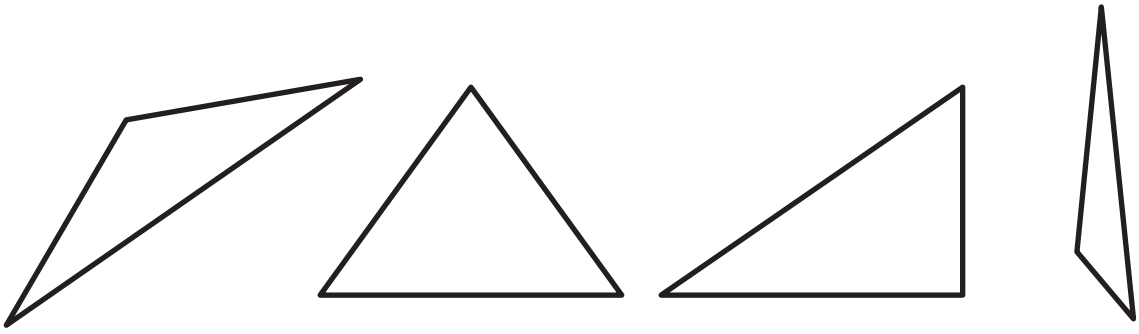
32. What time is it?




A. 1:15 B. 1:03

C. 3:01 D. 3:10

33. Choose right angled triangle.



A B C D

# JICA SIIQS Project

## Maths Test for Secondary School Students (S1)

Name:_____ _____ _____

First name Middle name Family name

School: _____ Class: _____ Student Number: _____

***** Sample **********

Calculate 2 + 5 =

A. 0 ✓B. 7 C. 10 D. 3

Circle or ✓ here.

Choose only one answer.

**********

1. Calculate : $8 \times 7$

A. 42 B. 49 C. 56 D. 15

2. Calculate : $4 + 4 \div 4 - 4$

A. 0 B. 1 C. -2 D. 8

3. Simplify : 26 – 32 + 43

A. 29 B. 49 C. 37 D. 101

4. Simplify : 23 – (– 42)

A. 29 B. 21 C. -19 D. 65

5. Find the remainder of the following : $489 \div 37$

A. 13 B. 6 C. 7 D. 8

6. The sum 691 + 208 is closest to the following sum

A. 600 + 200 B. 700 + 200 C. 700 + 300 D. 900 + 200

7. Multiply : $-12 \times (-25)$

A. 120 B. –240 C. –300 D. 300

8. Subtract : 2.201 – 0.753

A. 1.448 B. 1.458 C. 1.548 D. 1.558

9. Divide : $24.6 \div 0.04$.

A. 0.615 B. 6.15 C. 61.5 D. 615

10. Multiply 0.203 by 0.56

A. 0.1288 B. 0.01288 C. 0.11368 D. 0.011368

11. Calculate the following : $\frac{3}{8} \div \frac{3}{4}$

A. $\frac{9}{32}$ B. $\frac{1}{2}$ C. $\frac{3}{4}$ D. $-\frac{1}{2}$

12. Simplify : $\frac{3}{4} + \left(\frac{2}{3} \times \frac{1}{4}\right)$

A. $\frac{1}{8}$ B. $\frac{5}{16}$ C. $\frac{5}{6}$ D. $\frac{11}{12}$

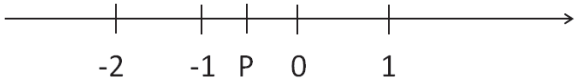
13. Which of the following fractions is the smallest? $\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}$.

A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$

14. In which list of fractions are all of the fractions equivalent respectively?

A. $\frac{1}{2}, \frac{2}{4}, \frac{4}{6}$ B. $\frac{2}{3}, \frac{4}{6}, \frac{8}{12}$ C. $\frac{2}{5}, \frac{4}{10}, \frac{8}{50}$ D. $\frac{3}{4}, \frac{2}{4}, \frac{4}{6}$ E. $\frac{3}{4}, \frac{4}{6}, \frac{6}{8}$

15. What number does the letter P represent on the number line below?

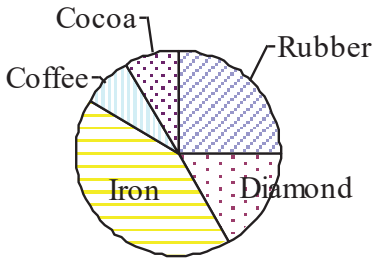



A. $-\frac{3}{2}$ B. $-\frac{1}{2}$ C. $\frac{1}{2}$ D. $\frac{3}{2}$

16. Change 35% to the simplest fraction.

A. $\frac{7}{2}$ B. $\frac{7}{20}$ C. $\frac{7}{200}$ D. $\frac{7}{2000}$

17. The pie graph below shows the main export of a country. What percentage of the shaded portion of the exports is rubber?




A. 10% B. 15% C. 20% D. 25%

18. Find the value of $x$, if $12x - 10 = 6x + 32$ .

A. 5 B. 6 C. 7 D. 8

19. If the ratio 7 to 13 is the same as the ratio $x$ to 52, what is the value of $x$?

A. 7 B. 13 C. 28 D. 364

20. An American tourist wants to change $30.00 American dollars to Rwandan francs. How much Frw will he receive if $1.00 exchanges for 820 Rwf?

A. 246 Rwf B. 2,460 Rwf C. 24,600 Rwf D. 820 Rwf

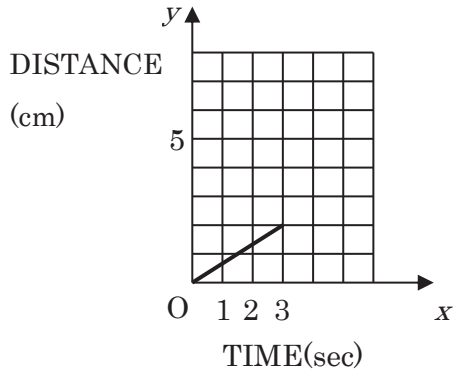
21. If $x$ is proportional to $y$ in the following table, find the value of $p$ and $q$ below.

| $x$ | 3 | 6 | $q$ |
|---|---|---|---|
| $y$ | 7 | $p$ | 35 |

A. $p = 14,\ q = 31$ B. $p = 10,\ q = 14$

C. $p = 10,\ q = 31$ D. $p = 14,\ q = 15$

22. This graph shows how fast an ant walks along the straight line. If this ant keeps walking at the same speed as ever, what is the distance that this ant walks in 30 seconds?




A. 5cm B. 6cm C. 20cm D. 25cm

23. The table represents a relation between $x$ and $y$. What is the missing number in the table?

A. 9

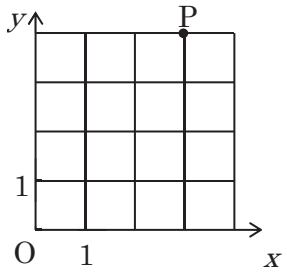
B. 10

C. 11

D. 12

| $x$ | $y$ |
|---|---|
| 2 | 5 |
| 3 | 7 |
| 4 | ? |
| 7 | 15 |

24. What are the coordinates of point P?



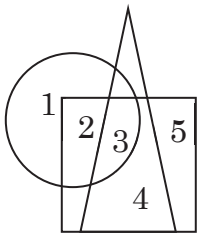

A. (3, 4)

B. (4, 3)

C. (–3, 4)

D. (3, –4)

25. In the figure below, which number belongs to the square, the circle and not to the triangle?




A. 1

B. 2

C. 3

D. 4

E. 5

26. Which is the smallest number among the following?

700mm, 6cm, 0.15m, 0.002km

A. 700mm B. 6cm C. 0.15m D. 0.002km

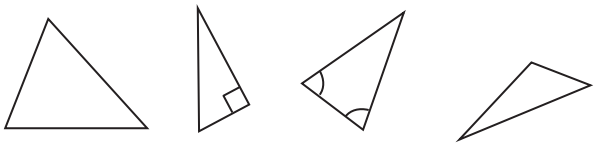
27. Which of the following is the closest to the value of

$\pi : \frac{\text{circumference}}{\text{diameter}}$ ?

A. 1.5 B. 2.1 C. 3.1 D. 4.1

28. Which of the following is an isosceles triangle?

A. B. C. D.



29. The car is 3.5m long. About how long is the building?

A. 18m B. 14m C. 10m D. 4m

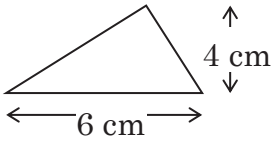
30. Which of the following is the area of a triangle whose base and height are 6 cm and 4 cm respectively?

A. 10 $cm^2$

B. 12 $cm^2$

C. 24 $cm^2$

D. 10 cm



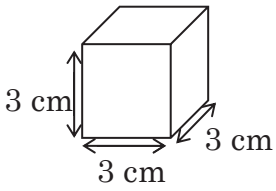

31. What is the volume of the cube below?

A. 9 $cm^3$

B. 18 $cm^3$

C. 27 $cm^3$

D. 64 $cm^3$



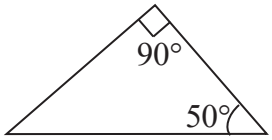

32. What is ∠ABC in the triangle below?

A. 20°

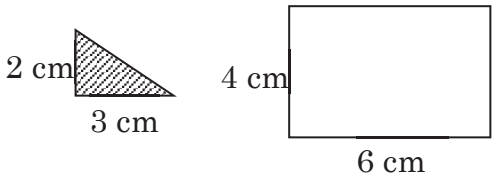
B. 40°

C. 50°

D. 80°

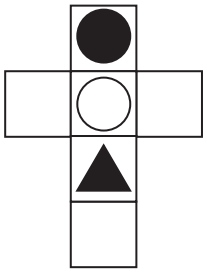



33. How many of the shaded right-angled triangles below are needed to cover exactly the surface of the given rectangle?



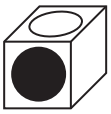

A. Four B. Six C. Eight D. Ten

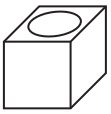
34. Which of the following cubes could be made by folding the figure below?



A.

B.

C. 

D. 

35. Find the highest common factor (HCF) and the least common multiple (LCM) of 12 and 18.

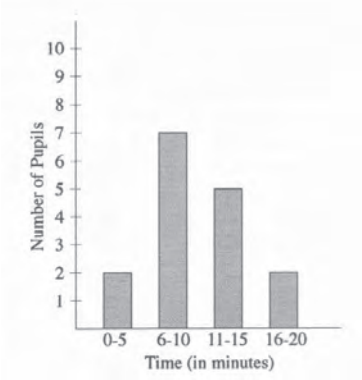
A. HCF = 4, LCM = 36

B. HCF = 6, LCM = 36

C. HCF = 6, LCM = 48

D. HCF = 8, LCM = 48

36. The graph shows the time of travel by students from home to school. How many pupils must travel for MORE THAN 10 minutes?




A. 2

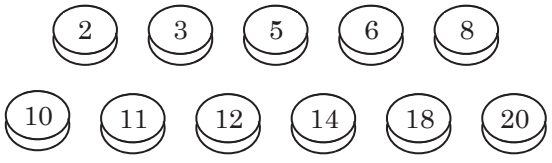
B. 5

C. 7

D. 8

E. 15

37. The eleven chips below are placed in a bag and mixed. Emmanuel draws one chip from the bag without looking. What is the probability that Emmanuel draws a chip with a number that is a multiple of three?




A. $\frac{1}{11}$ B. $\frac{1}{3}$ C. $\frac{4}{11}$ D. $\frac{3}{11}$

38. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6?

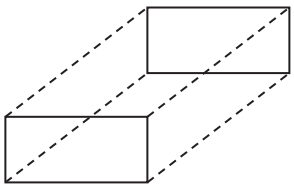
A. 12 B. 15 C. 18 D. 36

39. How many Common Multiples of 2 and 3 are between 1 and 20?

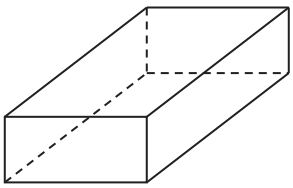
A. 1 B. 3 C. 6 D. 10

40. Which of the dotted lines in the shapes drawn below show the hidden edges of the cuboid?

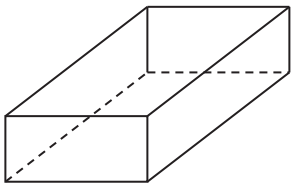
A.



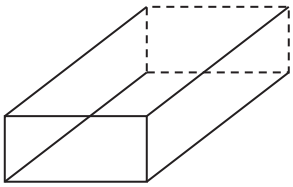
B.



C.



D.



# JICA SIIQS Project

## Maths Test for Secondary School Students (S4)

Name:_____ _____ _____

First name Middle name Family name

School: _____ Class: _____ Student Number: _____

***** Sample **********

Calculate 2 + 5 =

A. 0 ✓B. 7 C. 10 D. 3

Circle or ✓ here.

Choose only one answer.

**********

1. Multiply : $302 \times 50$

A. 1600 B. 16000 C. 1510 D. 15100

2. Calculate : $4+4\div4-4$

A. 0 B. 1 C. 7 D. 8

3. Simplify : 26 – 32 + 43

A. 29 B. 49 C. 37 D. 101

4. Simplify : 23 – (– 42)

A. 29 B. 21 C. -19 D. 65

5. Find the remainder of the following : $489 \div 37$

A. 5 B. 6 C. 7 D. 8

6. Multiply : $-12 \times (-25)$

A. 120 B. –240 C. –300 D. 300

7. Subtract : 2.201 – 0.753

A. 1.448 B. 1.458 C. 1.548 D. 1.558

8. Divide : $24.6 \div 0.04$.

A. 0.615 B. 6.15 C. 61.5 D. 615

9. Multiply 0.203 by 0.56

A. 0.1288 B. 0.01288 C. 0.11368 D. 0.011368

10. Calculate the following : $\frac{3}{8} \div \frac{3}{4}$

A. $\frac{9}{32}$ B. $\frac{1}{2}$ C. $\frac{3}{4}$ D. $-\frac{1}{2}$

11. Simplify : $\frac{3}{4} + \left(\frac{2}{3} \times \frac{1}{4}\right)$

A. $\frac{1}{8}$ B. $\frac{5}{16}$ C. $\frac{5}{6}$ D. $\frac{11}{12}$

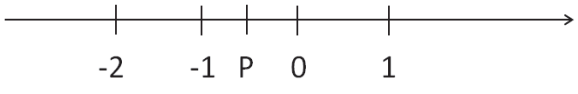
12. Which of the following fractions is the smallest? $\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}$.

A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$

13. In which list of fractions are all of the fractions equivalent respectively?

A. $\frac{1}{2}, \frac{2}{4}, \frac{4}{6}$ B. $\frac{2}{3}, \frac{4}{6}, \frac{8}{12}$ C. $\frac{2}{5}, \frac{4}{10}, \frac{8}{50}$ D. $\frac{3}{4}, \frac{2}{4}, \frac{4}{6}$ E. $\frac{3}{4}, \frac{4}{6}, \frac{6}{8}$

14. What number does the letter P represent on the number line below?




A. $-\frac{3}{2}$ B. $-\frac{1}{2}$ C. $\frac{1}{2}$ D. $\frac{3}{2}$

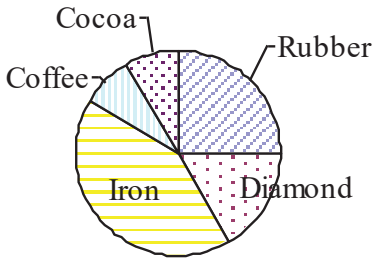
15. If the ratio 7 to 13 is the same as the ratio $x$ to 52, what is the value of $x$?

A. 7 B. 13 C. 28 D. 364

16. Change 35% to the simplest fraction.

A. $\frac{7}{2}$ B. $\frac{7}{20}$ C. $\frac{7}{200}$ D. $\frac{7}{2000}$

17. The pie graph below shows the main export of a country. What percentage of the shaded portion of the exports is rubber?




A. 10% B. 15% C. 20% D. 25%

18. If a, b and c are different real numbers, then which of the following is true?

A. $a - b = b - a$

B. $a(b - c) = b(c - a)$

C. $b - c = c - b$

D. $ab = ba$

19. Find the value of $x$, if $12x - 10 = 6x + 32$ .

A. 5 B. 6 C. 7 D. 8

20. An American tourist wants to change $30.00 American dollars to Rwandan francs. How much Rwf will he receive if $1.00 exchanges for 820 Rwf?

A. 246 Rwf B. 2,460 Rwf C. 24,600 Rwf D. 820 Rwf

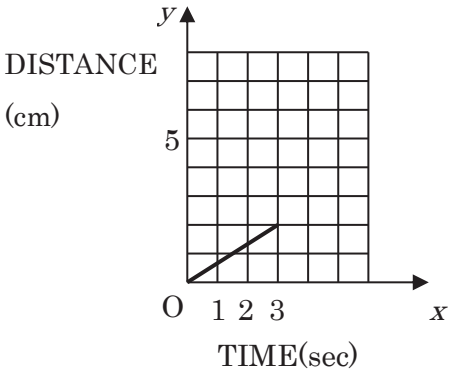
21. If $x$ is proportional to $y$ in the following table, find the value of $p$ and $q$ below.

| $x$ | 3 | 6 | $q$ |
|---|---|---|---|
| $y$ | 7 | $p$ | 35 |

A. $p = 14,\quad q = 31$ B. $p = 10,\quad q = 14$

C. $p = 10,\quad q = 31$ D. $p = 14,\quad q = 15$

22. This graph shows how fast an ant walks along the straight line. If this ant keeps walking at the same speed as ever, what is the distance that this ant walks in 30 seconds?




A. 5cm B. 6cm C. 20cm D. 25cm

23. The table represents a relation between $x$ and $y$. What is the missing number in the table?

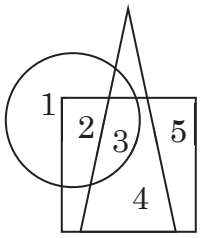
A. 9
B. 10
C. 11
D. 12

| $x$ | $y$ |
|---|---|
| 2 | 5 |
| 3 | 7 |
| 4 | ? |
| 7 | 15 |

24. Calculate $\frac{1}{6}x^2 - \frac{1}{3}x - 1 = 0$

A. $\pm 3$ B. $1 + \sqrt{7}$ C. $1 \pm \sqrt{7}$ D. $1 \pm \sqrt{6}$

25. In the figure below, which number belongs to the square, the circle and not to the triangle?




A. 1

B. 2

C. 3

D. 4

E. 5

26. Which is the smallest number among the following?

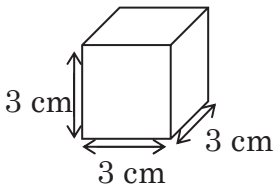
700mm, 6cm, 0.15m, 0.002km

A. 700mm B. 6cm C. 0.15m D. 0.002km

27. Which of the following is equivalent to $\frac{7}{6}\pi$

A. 30° B. 70° C. 120° D. 210°

28. What is the volume of the cube below?



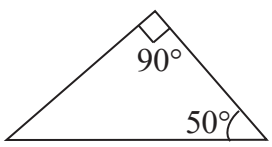

A. 9 $cm^3$

B. 18 $cm^3$

C. 27 $cm^3$

D. 64 $cm^3$

29. What is ∠ABC in the triangle below?




A. 20°

B. 40°

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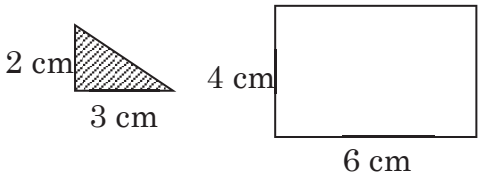
D. 80°

30. How many of the shaded right-angled triangles below are needed to cover exactly the surface of the given rectangle?



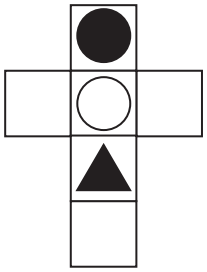

A. Four

B. Six

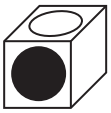
C. Eight

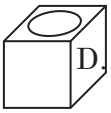
D. Ten

31. Which of the following cubes could be made by folding the figure below?



A.

B. 

C. D. 

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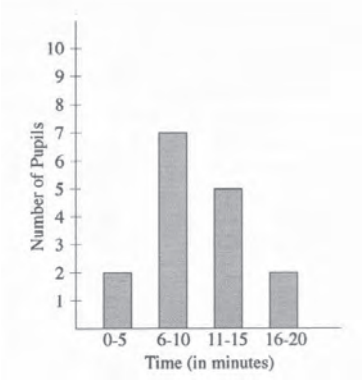


A. 2

B. 5

C. 7

D. 8

E. 15

34. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6?

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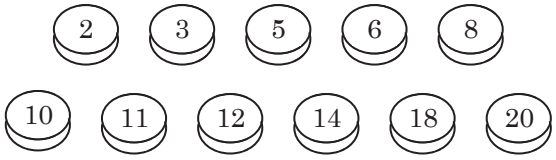
35. The eleven chips below are placed in a bag and mixed. Emmanuel draws one chip from the bag without looking. What is the probability that Emmanuel draws a chip with a number that is a multiple of three?




A. $\frac{1}{11}$ B. $\frac{1}{3}$ C. $\frac{4}{11}$ D. $\frac{3}{11}$

36. You are given the following sets;

A = {x: x is a multiple of 2 less than 20}, B = {x: x is a multiple of 3 less than 20}

How many elements are there in $A \cap B$?

A. 1 B. 3 C. 6 D. 10

37. Factorise the following : $9x^2 - 25$

A. $(3x + 5)^2$ B. $(3x - 5)^2$ C. $(3x + 5)(3x - 5)$ D. $x(9x - 25)$

38. Two vectors are such that $\boldsymbol{a} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}, \boldsymbol{b} = \begin{pmatrix} 3+k \\ 4+t \end{pmatrix}$.

If $\boldsymbol{a} = \boldsymbol{b}$, find the values of $k$ and $t$.

A. $k =$ 0, $t =$ 0 B. $k = -1$, $t =$ 1

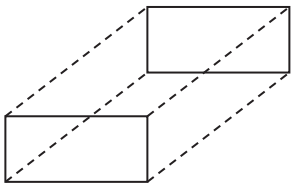
C. $k =$ 1, $t = -1$ D. $k =$ 4, $t =$ 3

39. The three sides of a right-angled triangle are x, x+1 and 5. Find x, if the longest side is 5.

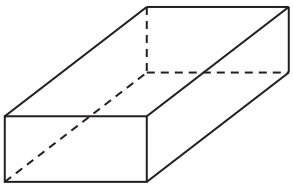
A. x = 5 B. x = -4, 3 C. x = 3 D. x = 1

40. Which of the dotted lines in the shapes drawn below show the hidden edges of the cuboid?

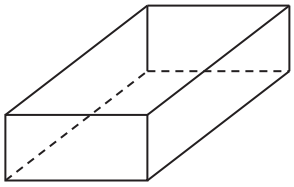
A.



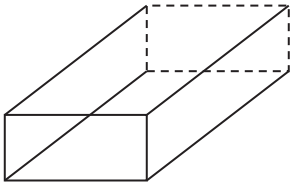
B.



C.



D.



# JICA SIIQS Project

## Science Test for Primary School Students (P4)

Name:_____ _____ _____

First name Middle name Last name

School: _____ Class: _____ Student Number: _____

**Circle the letter of the best answer choice from A, B, C and D. (Choose Only ONE Answer)**

********** Sample **********

Calculate 2 + 5 =

A. 0

B. 7

C. 10

D. 3

**Circle or ✓ here.**

**Choose only one answer.**

**********

1. Which one is a living thing?

Sun

A.

Rock

B.

Tree

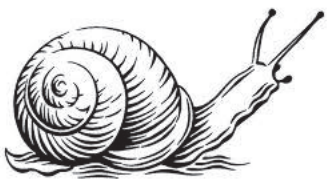
C.

Water

D.

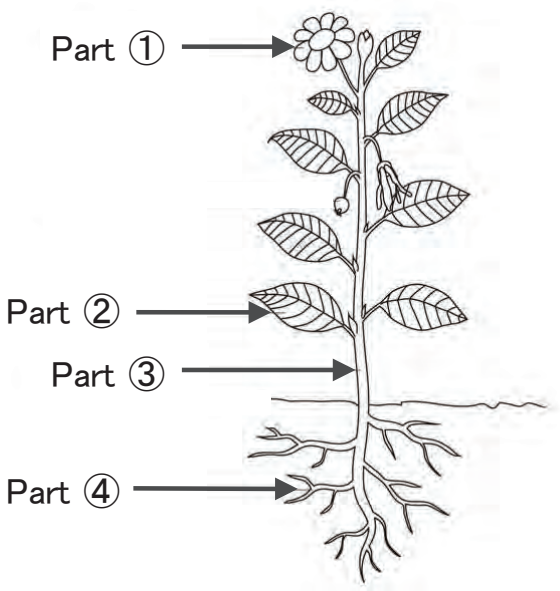
2. A snail is a living thing.
   Which is a <u>wrong</u> explanation about it?

   A. A snail change its size.
   B. A snail moves.
   C. A snail does not reproduce its children.
   D. A snail needs food.



Snail

The diagram shows flowering plants.




3. What is the name of part ④?
   A. Flower
   B. Stem
   C. Leaf
   D. Root

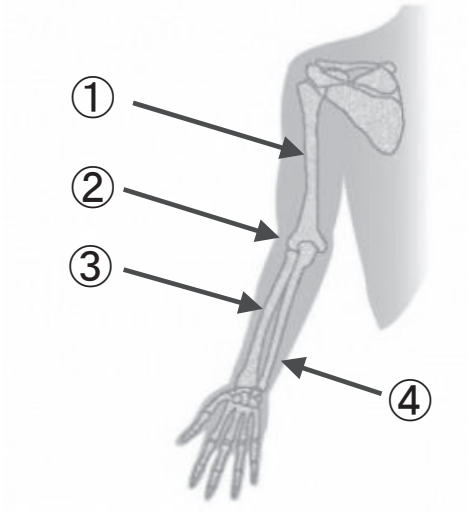
4. Which part absorbs water from the soil?
   A. part ①
   B. part ②
   C. part ③
   D. part ④

5. Which one is an important thing for plant growth?
   A. Electricity
   B. Sunlight
   C. Oil
   D. Salt

6. The diagram shows bones of right arm and hand.
   You can bend your arm at the joint.

   Which part is the joint of arm?

   A. ①
   B. ②
   C. ③
   D. ④




7. Which of the followings is **NOT Correct** on the explanation of Animals?
   A. Vertebrate has five categories namely fish, amphibian, reptiles, birds and mammal.
   B. Invertebrate animals do not have backbone.
   C. Mammals have udder.
   D. All domestic animals are mammals.

8. Which animal(s) belong to mammal?

① Rabbit

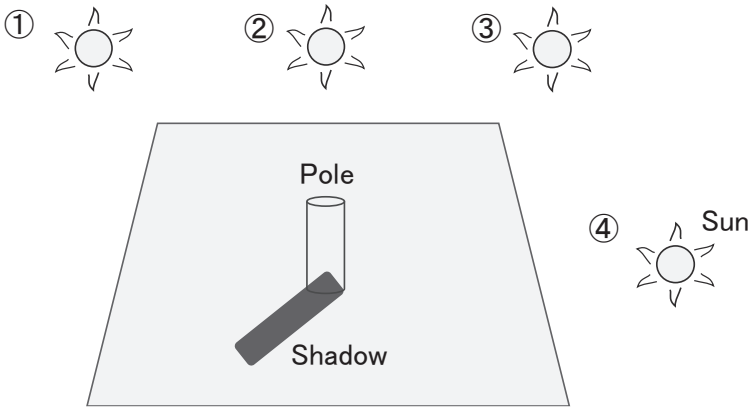
② Cow

③ Chicken

④ Snake

A. ① is mammal.
B. ① and ② are mammal.
C. ①, ② and ③ are mammal.
D. ①, ②, ③ and ④ are mammal.

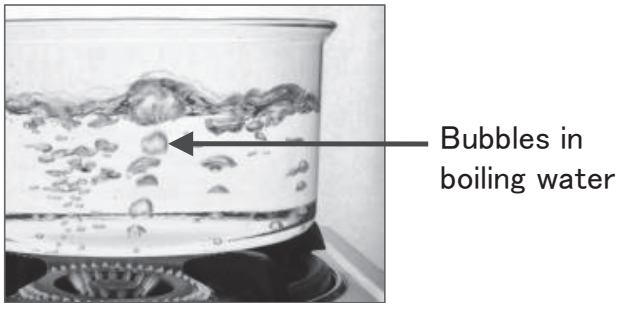
9. Shadow of pole is formed on the ground.
Where does the Sun locate at?




A. ①
B. ②
C. ③
D. ④

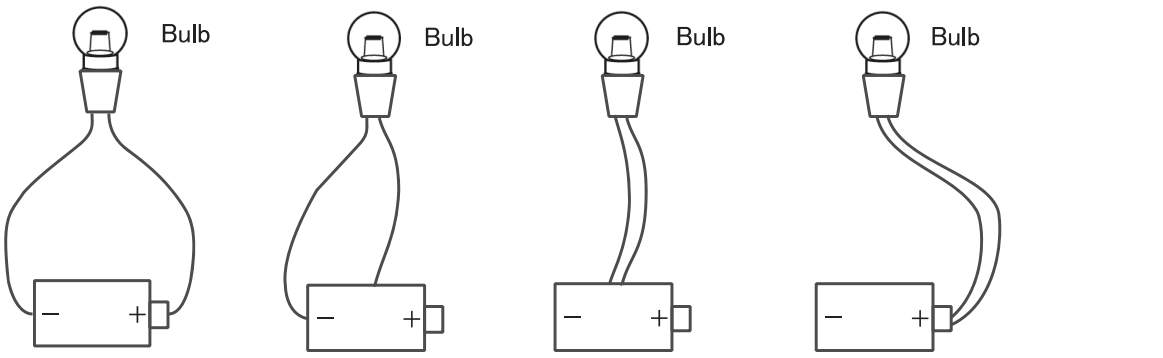
10. The moon does <u>not</u> give off its own light. Why can you see the Moon?
A. It bends light from the Sun.
B. It gets through light from the Sun.
C. It takes in light from the Sun.
D. It reflects light from the Sun.

11. In the photo, water is boiling.
What is in the bubbles of boiling water?




A. Air
B. Ice
C. Water vapour
D. Glass

12. Which diagram shows the connection that can make the bulb light?



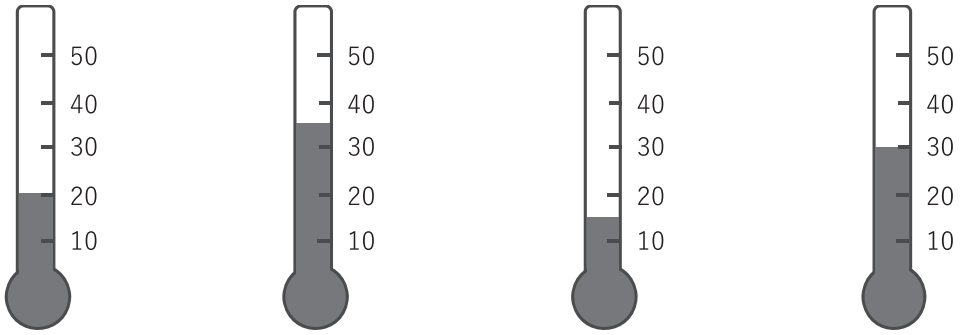

13. Which one can conduct electricity?

Plastic bag A. | Iron nail B. | Glass bottle C. | Wood ruler D.

14. Which one is a **Wrong** explanation about sound?

A. Sound does not travel through water.
B. Sound travels through air.
C. Sound travels through wall.
D. Sound travels through human body.

15. Which thermometer reading shows the hottest?

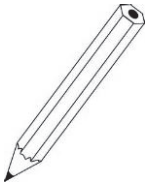


16. Which of the following is attracted by a magnet?

A. Aluminium foil

B. Paper bag

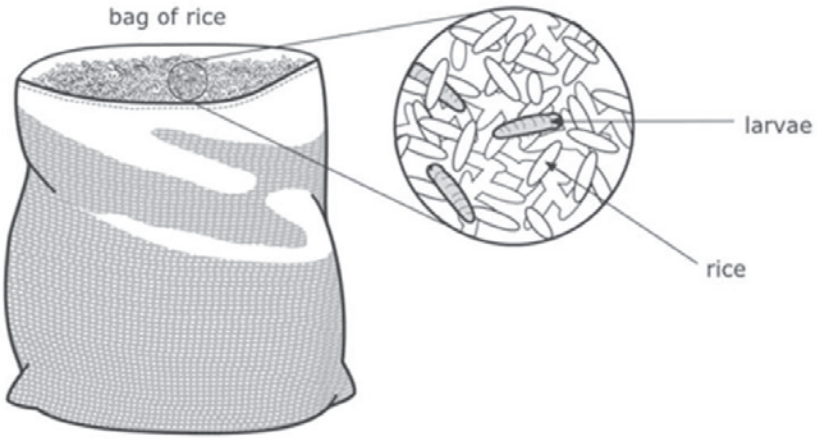
C. Pencil



D. Iron nail

17. Which of the following statements is NOT correct about types of Food?
    A. Fruit and Vegetables keep us hungry.
    B. Dairy (milk) products make our bones strong.
    C. Grains (or cereals) give us energy.
    D. Meat helps us grow and makes us strong.

18. Larvae were found in a bag of rice. What best explains the larvae got there?




    A. They came from water in the bag.
    B. They came from air in the bag.
    C. They came from the rice itself.
    D. They came from eggs laid by insects.

**END**

# JICA SIIQS Project

## Science Test for Secondary School Students (S1)

Name:_____ _____ _____

First name Middle name Family name

School: _____ Class:_____ Student Number: _____

### PART A

**Circle the letter of the best answer choice from A, B, C and D. (Choose Only ONE Answer)**

***Question 1***

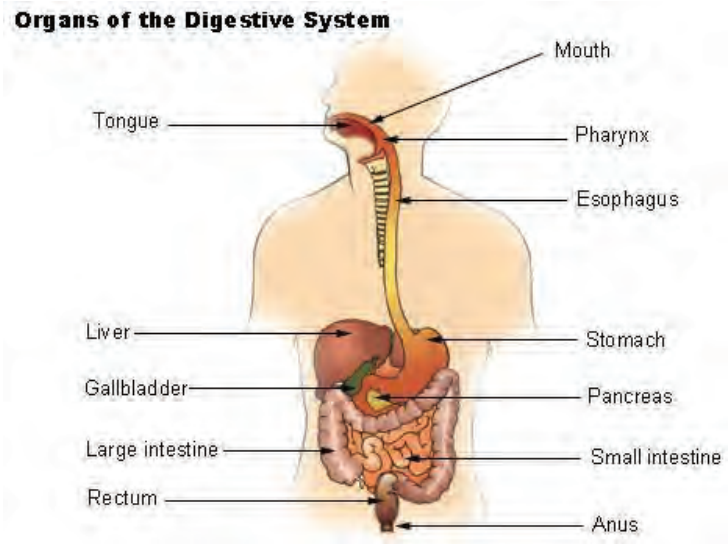
Digestion is the process by which food is broken into simple substances which can be used by the body. It is an important process because it allows the body to get useful nutrients from the food that we eat. In which organ do we absorb important nutrition such as amino acids and glucose?

A. stomach

B. small intestine

C. large intestine

D. liver




***Question 2***

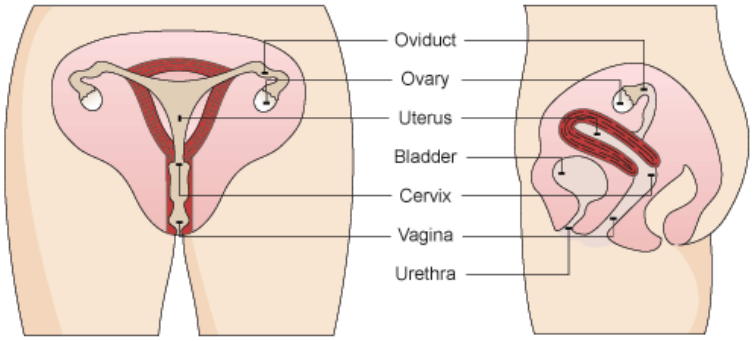
The figure below shows the female reproductive system. In which organ does fertilization take place?

A. ovary

B. oviduct

C. uterus

D. cervix

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Which of the following foods is correctly matched to its group?

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B. eggs → protective

C. carrots → energy giving

D. bananas → body building

***Question 4***

Which one of the following is the most effective preventive measure against the spread of sexually transmitted infections amongst the youth in schools?

A. seeking medical attention

B. use of condoms

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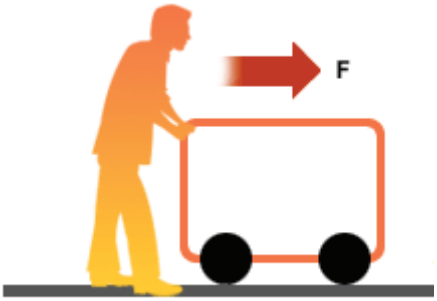
***Question 5***

A force of 20N pushes a box 5m in the direction of the force.




Calculate the work done.

A. 4 N/m

B. 15 Nm

C. 25 Nm

D. 100 Nm

***Question 6***

When suspended freely, a magnet always faces

A. Up-Down direction

B. North-South direction

C. West-East direction

D. Free direction

***Question 7***

Below are some examples of second class levers. Which statement for the second class levers is correct?

A. the load lies in between the effort and the fulcrum.

B. the fulcrum is always between the load and the effort.

C. the effort lies in between the load and the fulcrum.

D. it can be categorized into wheel, screws and gears.

***Question 8***

If you have a mixture of iron filings and sand, how can you separate them?

A. put them in water and boil them to remove sand

B. use magnet to attract iron filings

C. use filter to collect sand only

D. burn them to remove iron filings and cool them down

***Question 9***

Which one of the following consists of only materials that are ALL non-magnetic?

A. aluminium foil, piece of paper

B. iron nails, plastic bottle

C. piece of glass, sewing needle

D. steel wool, water

***Question 10***

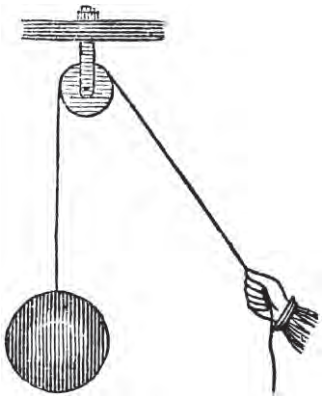
Which statement on the single fixed pulley is NOT correct?

A. it is made up of only one pulley which is fixed

B. it reduces the effort needed and it changes the direction of the force

C. effort distance is equal to the load distance

D. it enables us to raise a load much higher than the person doing it



***Question 11***

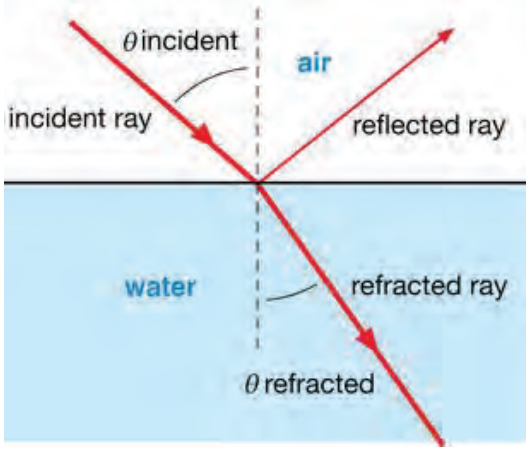
Below is the diagram of incident ray, refracted ray and reflected ray at the boundary of air and water. Which statement is correct?

A. angle of incident is equal to angle of refraction

B. angle of incident is bigger than angle of refraction

C. angle of incident is smaller than angle of refraction

D. angle of reflection is equal to angle of refraction



***Question 12***

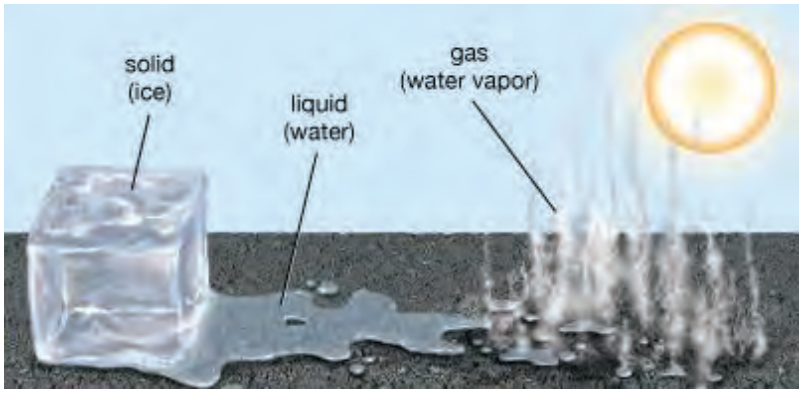
What do you call the process of the change of the states from gas to liquid?

A. evaporation

B. melting

C. condensation

D. sublimation




***Question 13***

Which statement on the inclined plane is NOT correct?

A. it is also known as a slope

B. the effort required to lift the brick when using an inclined plane is smaller than the effort required without the inclined plane

C. a bigger force is required when using the steep inclined plane, and a smaller force is required when the inclined plane is gentle.

D. it enables us to lift a plank of wood on a inclined plane by reducing the amount of work

End of Part A

## PART B

***Question 1***

Bacteria that enter the body are destroyed by which type of cells?

A. white blood cells

B. red blood cells

C. kidney cells

D. lung cells

***Question 2***

Many seeds can germinate in the light or in the dark. State two conditions necessary for germination.

A. Water and Air

B. Soil and Water

C. Sun light and Air

D. Germ and Soil

***Question 3***

The following table shows the classification of some animals into two categories.

| Category 1 | Category 2 |
|---|---|
| Rabbit | Frog |
| Giraffe | Spider |
| Elephant | Lion |

Which of the following was used to classify these animals?

A. organs used in breathing

B. food source

C. method of reproduction

D. pattern of movement

***Question 4***

What happens to the particles (molecules) of a liquid when the liquid cools?

A. They slow down.

B. They speed up.

C. They decrease in number.

D. They decrease in size.

***Question 5***

Rods made of different materials are connected between points P and Q in the circuit diagram shown below.

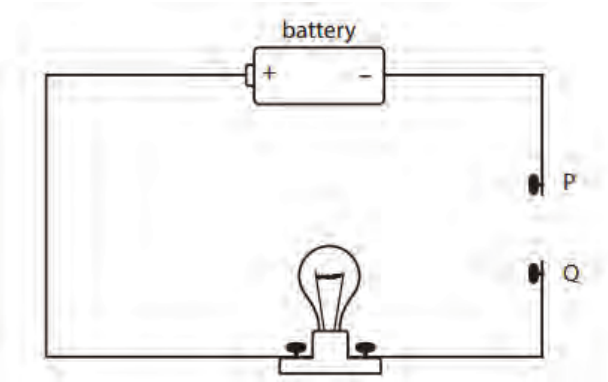
Which rod would cause the bulb to light?

A. copper rod

B. wood rod

C. glass rod

D. plastic rod




***Question 6***

A student sets up an investigation to test the strength of magnets. He has several magnets of different sizes, shapes, and masses. He uses the magnets to lift metal paper clips. How is the strength of a magnet defined in the investigation?

A. by the mass of the magnet lifting the metal paper clips

B. by the size of the magnet lifting the metal paper clips

C. by the number of metal paper clips lifted by the magnet

D. by the time the metal paper clips stay on the magnet

***Question 7***

An object has a density of 1.1 g/cm$^3$. Liquid X, Y and Z have a density of 1.3 g/cm$^3$, 0.9 g/cm$^3$ and 1.2 g/cm$^3$, respectively. In which liquid would this object float?

A. Liquid X

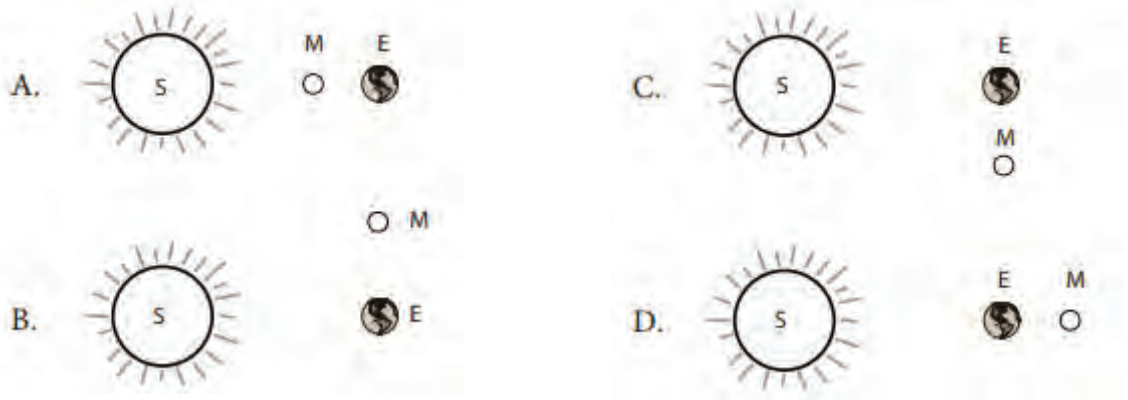
B. Liquid Y

C. Liquid Z

D. Liquid X and Z

***Question 8***

Which diagram shows the position of the Sun (S), moon (M), and Earth (E) during an eclipse of the moon? (Not drawn to scale)



***Question 9***

Some volcanic rocks have many holes in them.

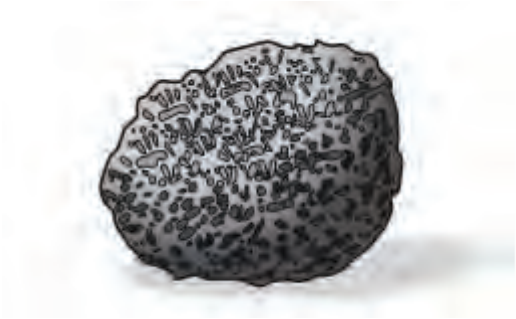
How were the holes made?

A. Insects dug into the rock when it was soft.

B. Gas bubbles were trapped in the rock when it cooled.

C. Rain dropped on the rock when it was soft.

D. Small stones fell out of the rock when it cooled.



***Question 10***

Which statement is NOT correct on how you can you make use of computer at school or at home?

A. Writing documents

B. Drawing pictures

C. Cooking breakfast

D. Searching information

***Question 11***

How often have you used laptop computers at your school or at home.

A. Almost everyday

B. Once in a week

C. Once in a month

D. Never used

***Question 12***

Calculate the volume of a body with 0.8 g/$cm^3$ and 240g.

A. 192 $cm^3$

B. 239.2 $cm^3$

C. 240.8 $cm^3$

D. 300 $cm^3$

**END**

# JICA SIIQS Project
# Science Test for Secondary School Students (S4)

Name:_____ _____ _____

First name Middle name Family name

School: _____ Class:_____ Student Number: _____

## PART A

**Circle the letter of the best answer choice from A, B, C and D. (Choose Only ONE Answer)**

***Question 1***

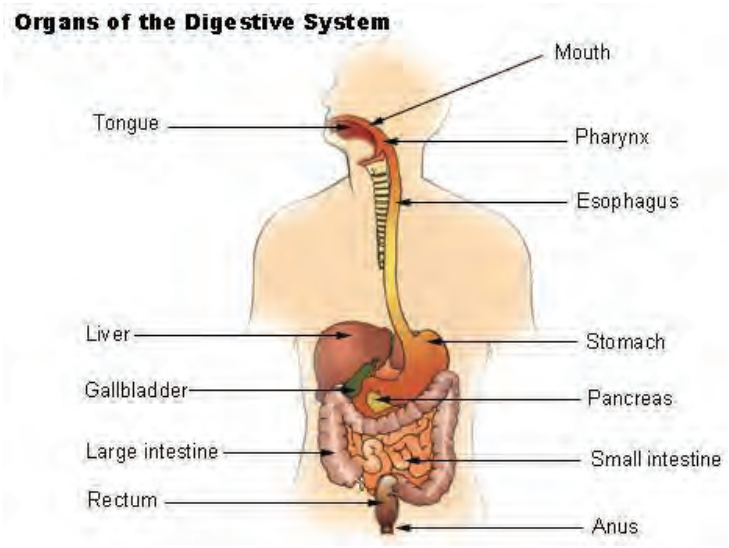
Digestion is the process by which food is broken into simple substances which can be used by the body. It is an important process because it allows the body to get useful nutrients from the food that we eat. In which organ do we absorb important nutrition such as amino acids and glucose?

A. stomach

B. small intestine

C. large intestine

D. liver




***Question 2***

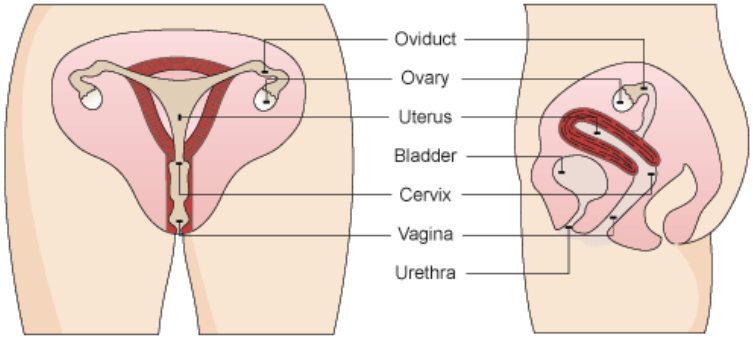
The figure below shows the female reproductive system. In which organ does fertilization take place?

A. ovary

B. oviduct

C. uterus

D. cervix

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Which of the following foods is correctly matched to its group?

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B. eggs → protective

C. carrots → energy giving

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Which one of the following is the most effective preventive measure against the spread of sexually transmitted infections amongst the youth in schools?

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A force of 20N pushes a box 5m in the direction of the force.

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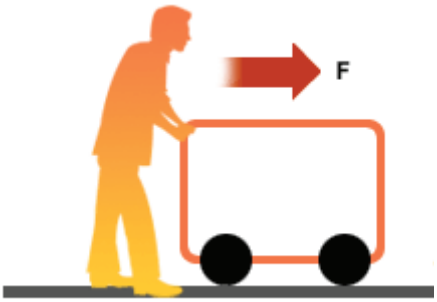


A. 4 N/m

B. 15 Nm

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C. West-East direction

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***Question 7***

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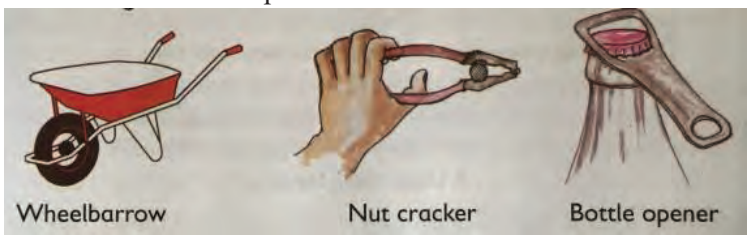


A. the load lies in between the effort and the fulcrum.

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D. it can be categorized into wheel, screws and gears.

***Question 8***

If you have a mixture of iron filings and sand, how can you separate them?

A. put them in water and boil them to remove sand

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***Question 9***

Which one of the following consists of only materials that are ALL non-magnetic?

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B. iron nails, plastic bottle

C. piece of glass, sewing needle

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Which statement on the single fixed pulley is NOT correct?

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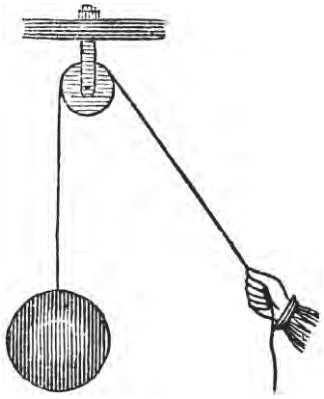

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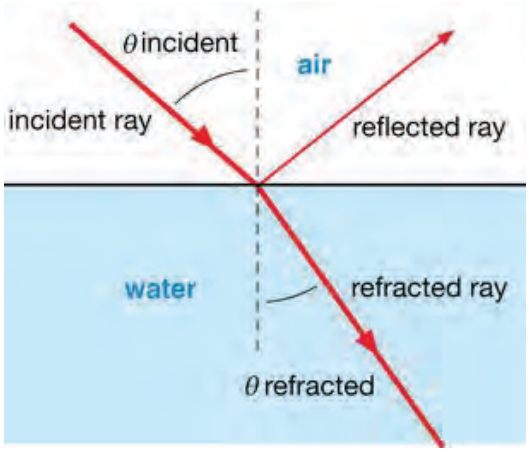

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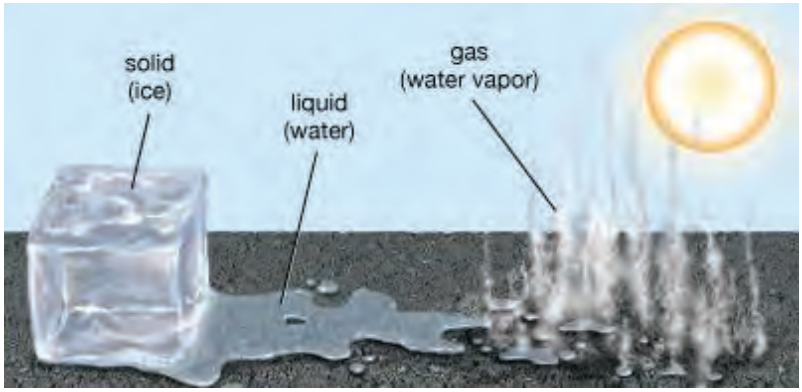



***Question 13***

Which statement on the inclined plane is NOT correct?

A. it is also known as a slope

B. the effort required to lift the brick when using an inclined plane is smaller than the effort required without the inclined plane

C. a bigger force is required when using the steep inclined plane, and a smaller force is required when the inclined plane is gentle.

D. it enables us to lift a plank of wood on a inclined plane by reducing the amount of work

End of Part A

## PART C

***Question 1***

Which of the following can provide the human body with long-term immunity against some diseases?

A. antibiotics

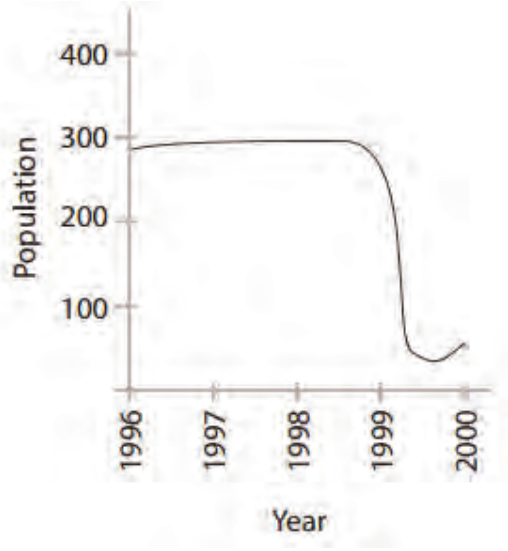
B. vitamins

C. vaccines

D. red blood cells

***Question 2***

The graph indicates the number of antelopes in a certain area over a period of time. Which of the following factors is most likely to have caused the sudden change in population between 1999 and 2000?




A. global warming

B. absence of predators

C. depletion of the ozone layer

D. brush fires that destroyed the food supply

***Question 3***

Bacteria that enter the body are destroyed by which type of cells?

A. white blood cells

B. red blood cells

C. kidney cells

D. lung cells

***Question 4***

Kidneys are organs found in the human body. When he was young, a man had one of his two kidneys removed because it was diseased. He now has a son. How many kidneys did his son have at birth?

A. 0

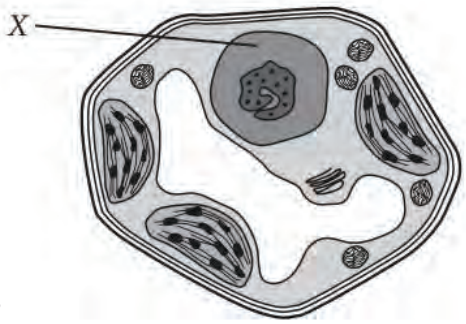
B. 1

C. 2

D. 3

***Question 5***

The diagram shows a plant cell. What is the function of the part of the cell labeled X?




A. It stores water.

B. It makes food.

C. It absorbs energy.

D. It controls activities.

***Question 6***

Which equation summarizes the process of respiration?

A. water + carbon dioxide + energy → sugar + oxygen

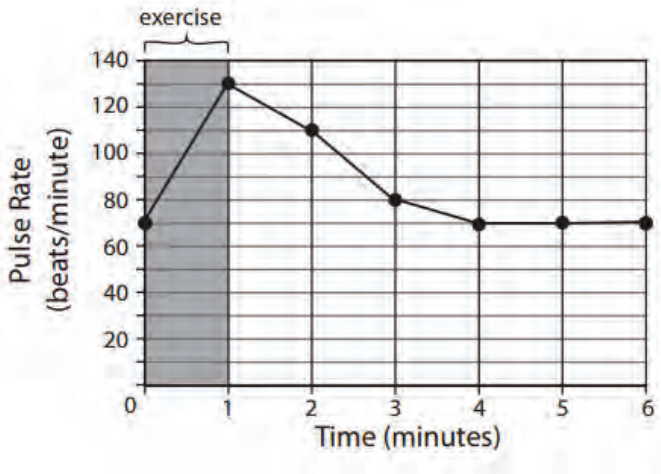
B. oxygen + sugar → carbon dioxide + water + energy

C. carbon dioxide + oxygen + water → sugar + energy

D. sugar + carbon dioxide + energy → oxygen + water

***Question 7***

John measures his pulse rate before he exercises. It is 70 beats per minute. He exercises for one minute and measures his pulse rate again. He then measures it every minute for several minutes. He draws a graph to show his results.




What can be concluded from his results?

A. His pulse rate increased by 50 beats per minute.

B. His pulse rate took less time to slow down than to increase.

C. His pulse rate after 4 minutes was 80 beats per minute.

D. His pulse rate returned to normal in less than 6 minutes.

***Question 8***

Twins are born. One is a boy and one is a girl. Which statement is correct about their genetic makeup?

A. The boy and the girl inherit genetic material from the father only.

B. The boy and girl inherit genetic material from the mother only.

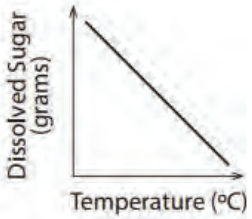
C. The boy and girl inherit genetic material from both parents.

D. The boy inherits genetic material from the father only and the girl inherits it from the mother only

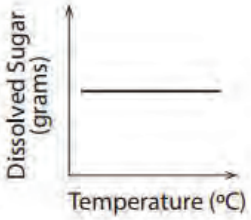
***Question 9***

Bob did an experiment to investigate the effect of temperature on the solubility of sugar in water by measuring the amount of sugar that would dissolve in 1 liter of water at different temperatures. He then plotted his results. Which of the following is likely to be the graph showing Bob's results?

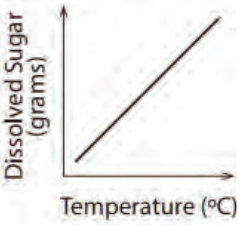
A.



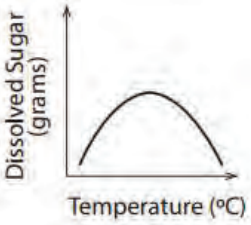

B.




C.

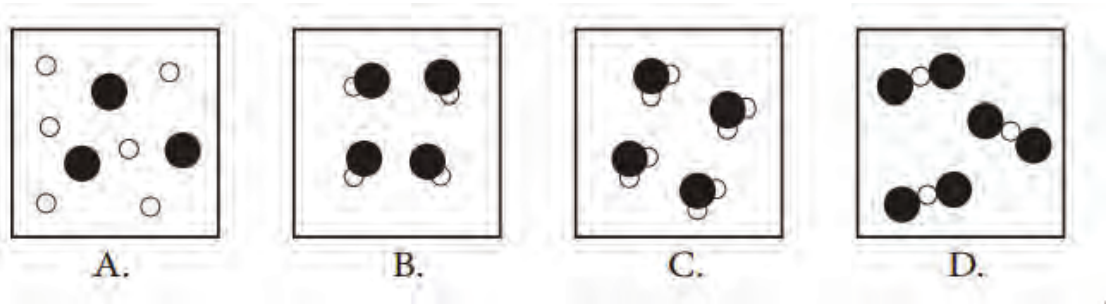



D.




***Question 10***

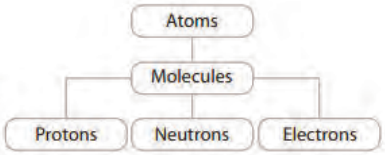
In the diagrams below, hydrogen atoms are represented by white circles, and oxygen atoms are represented by black circles. Which of the diagrams best represents water?



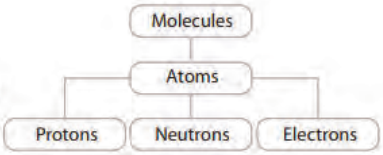

***Question 11***

Which of these diagrams best represents the structure of matter, starting with the more complex particles at the top and ending with the more fundamental particles at the bottom?

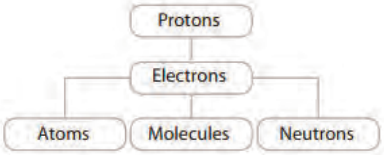
A.



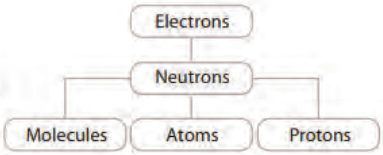

B.




C.




D.



***Question 12***

Some physical properties of five different substances (A, B, C, D, and E) are outlined in the table below.

| | Substance A | Substance B | Substance C | Substance D | Substance E |
|---|---|---|---|---|---|
| Physical state at room temperature (20°C) | Solid | Solid | Liquid | Liquid | Gas |
| Appearance/ colour | Shiny grey | White | Silver | Colourless | Colourless |
| Conducts electricity | Yes | No | Yes | Yes | No |

Which substances are metal?

A. Substance A, B and C

B. Substance A and B

C. Substance C and D

D. Substance A and C

***Question 13***

Which of the following energy conversions takes place in a battery-operated flashlight?

A. electrical → mechanical → light

B. chemical → mechanical → light

C. chemical → electrical → light

D. nuclear → electrical → light

***Question 14***

The figure shows a parachute jumper in four positions.

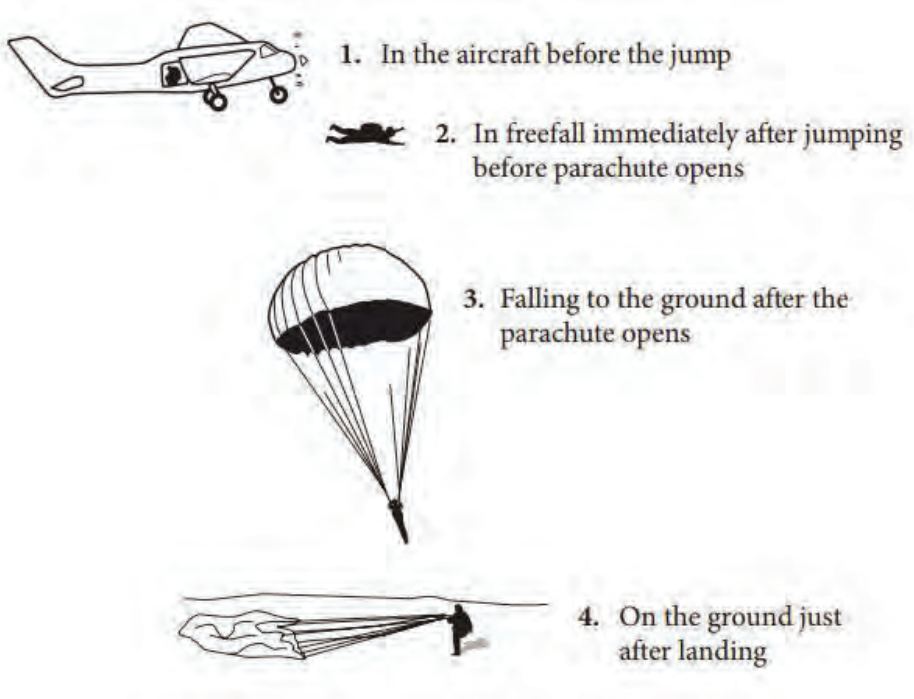
In which of the positions does the force of gravity act on the jumper?

A. Position 2 only.

B. Positions 2 and 3 only.

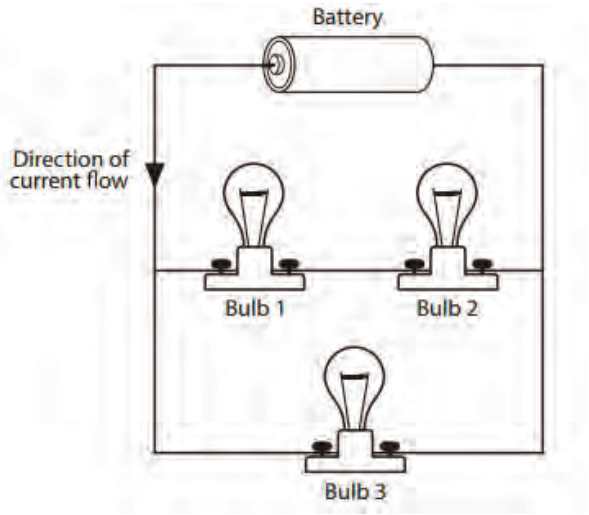
C. Positions 1, 2 and 3 only.

D. Positions 1, 2, 3, and 4.



***Question 15***

Three identical light bulbs are connected to a battery as shown in the diagram. The arrow indicates the direction of the current flow.




Which statement is true?

A. The current in Bulb 1 is greater than the current in Bulb 2.

B. The current in Bulb 1 is greater than the current in Bulb 3.

C. The current in Bulb 2 is the same as the current in Bulb 3.

D. The current in Bulb 2 is the same as the current in Bulb 1.

***Question 16***

A man climbed to the top of a very high mountain. While on the mountain top, he drank all the water in his plastic water bottle and then put the cover back on. When he returned to camp in the valley, he discovered that the empty bottle had collapsed. Which of the following best explains why this happened?

A. The temperature is lower in the valley than on the mountain top.

B. The temperature is higher in the valley than on the mountain top.

C. Air pressure in the valley is lower than on the mountain top.

D. Air pressure in the valley is higher than on the mountain top.

***Question 17***

A student sets up an investigation to test the strength of magnets. He has several magnets of different sizes, shapes, and masses. He uses the magnets to lift metal paper clips. How is the strength of a magnet defined in the investigation?

A. by the mass of the magnet lifting the metal paper clips

B. by the size of the magnet lifting the metal paper clips

C. by the number of metal paper clips lifted by the magnet

D. by the time the metal paper clips stay on the magnet

***Question 18***

Which of the following is the major cause of tides?

A. heating of the oceans by the Sun

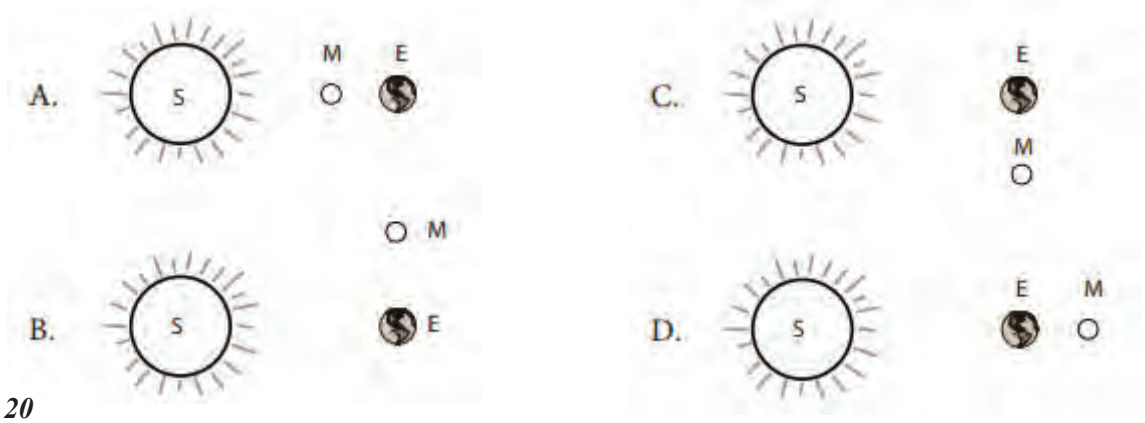
B. gravitational pull of the Moon

C. earthquakes on the ocean floor

D. changes in wind direction

***Question 19***

Which diagram shows the position of the Sun (S), moon (M), and Earth (E)
during an eclipse of the moon? (Not drawn to scale)




***Question 20***

Which statement is NOT correct on how you can you make use of computer at school or at home?

A. Writing documents

B. Drawing pictures

C. Cooking breakfast

D. Searching information

***Question 21***

How often have you used laptop computers at your school or at home.

A. Almost everyday

B. Once in a week

C. Once in a month

D. Never used

***Question 22***

Calculate the volume of a body with 0.8 g/cm$^3$ and 240g.

A. 192 cm$^3$

B. 239.2 cm$^3$

C. 240.8 cm$^3$

D. 300 cm$^3$

END

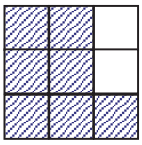
# Appendices F
# Result of Academic Achievement Test

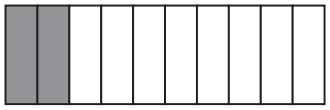
# Appendix F

# Result of Academic Achievement Test

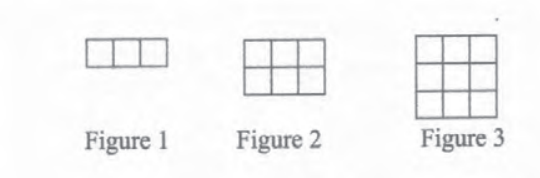
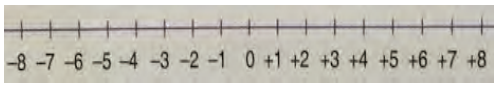
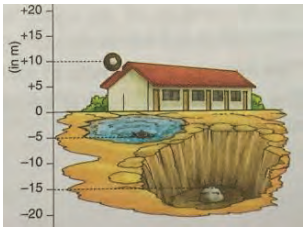
## P4 Mathematics

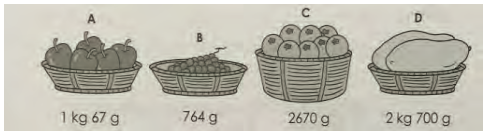
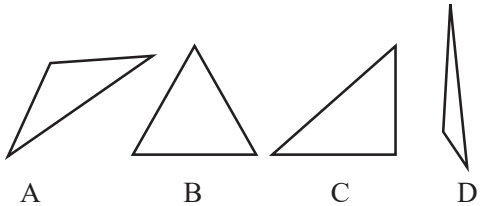
| | |
|---|---|
| $7 + 2 =$ ☐<br>A. 5 B. 72 C. 9<br>D. 27 | 1 RCA: 69% - C<br>TWA: B (12%) N/A (10%) |
| 2. The digit in the thousand's place in 72081 is …<br>A. 7 B. 2<br>C. 0 D. 8 | 2 RCA: 14% - B<br>TWA: D (28%)<br>Misconception arises when counting from right to left side |
| 3. Calculate : $8 \times 7$<br>A. 42 B. 49 C. 56<br>D. 15 | 3 RCA: 57% - C<br>TWA: B (15%) N/A (12%) |
| 4. Add : $\begin{array}{r} 14 \\ +\ 7 \\ \hline \end{array}$<br>A. 7 B. 11 C. 21<br>D. 111 | 4 RCA: 36% - C<br>TWA: B (21%) D (18%)<br><br>Misconception on carrying out<br>N/A (48%) at EP Buhande |
| 5. Calculate: 10 – 2 + 5<br>A. 3 B. 7 C. 13<br>D. 17 | 5 RCA: 40% - C<br>TWA: D (21%)<br><br>If TWA was A misconception would arise in MDAS law, if it was B misconception would arise in negative number concept. The reason for choosing D is not understandable. |
| 6. Multiply : $302 \times 50$<br>A. 1600 B. 16000<br>C. 1510 D. 15100 | 6 RCA: 13% - D<br>TWA: C (32%)<br><br>N/A (67%) at EP Buhande |

| | |
|---|---|
| 7. Divide : $276 \div 4$<br><br>A. 59 B. 69 C. 79<br>D. 64 | 7RCA: 21% - B<br>TWA: C (34%)<br><br>N/A (57%) at EP Buhande |
| 8. Add: 597 + 236<br><br>A. 733 B. 833 C. 823<br>D. 723 | 8 RCA: 58% - B<br>TWA: C (13%)<br><br>N/A (48%) at EP Buhande |
| 9. Subtract: 600 – 236<br><br>A. 264 B. 374 C. 464<br>D. 364 | 9 RCA: 34% - D<br>TWA: C (31%)<br><br>N/A (62%) at EP Buhande<br>Misconception: Carrying out |
| 10. What fraction of the diagram below is shaded?<br><br>A. $\frac{7}{2}$<br>B. $\frac{9}{7}$<br>C. $\frac{7}{9}$<br>D. $\frac{2}{7}$<br><br>  | 10 RCA: 27% - C<br>TWA: A (32%)<br><br>N/A (62%) at EP Buhande<br>Misconception: concept of fraction, meaning of denominator |
| 11. Which of the following fractions is the smallest? $\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}.$<br><br>A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$<br>D. $\frac{1}{2}$ | 11 RCA: 6% - A<br>TWA: D (68%), N/A (19%)<br><br>N/A (67%) at EP Buhande<br>Fraction concept is still a problem in both schools |

| | |
|---|---|
| 12. Calculate : $\frac{2}{7}+\frac{3}{7}$<br>A. $\frac{6}{7}$ B. $\frac{5}{14}$ C. $\frac{5}{7}$<br>D. $\frac{8}{7}$ | 12 RCA: 41% - C<br>TWA: B (32%) N/A (19%)<br><br>N/A (67%) at EP Buhande |
| 13. Simplify : $\frac{2}{5}\times\frac{3}{4}$<br>A. $\frac{3}{10}$ B. $\frac{3}{5}$ C. $\frac{5}{9}$<br>D. $\frac{8}{15}$ | 13 RCA: 5% - A<br>TWA: C (34%) D (32) N/A (20%)<br><br>N/A (81%) at EP Buhande<br>Fraction operation is problem in both schools.<br>Rate of correct answer at EP Buhande is Zero. |
| 14. $\frac{4}{6}-\frac{1}{6}=m$, m is …<br>A. $\frac{1}{3}$ B. $\frac{1}{9}$ C. $\frac{1}{18}$<br>D. $\frac{1}{2}$ | 14 RCA: 12% - D<br>TWA: A (29%), N/A (21%)<br><br>N/A (76%) at EP Buhande<br><br>Misconception: meaning of unknown value of "m" |
| 15. Which of the following is equal to 0.4?<br>A. 4 B. $\frac{4}{10}$ C. $\frac{4}{100}$<br>D. $\frac{1}{4}$ | 15 RCA: 12% - B<br>TWA: A (43%), N/A (16%)<br><br>N/A (81%) and RCA: 0% at EP Buhande |
| 16. Which decimal number does the following shaded part express?<br>  <br>A. 2.8 B. 0.5 C. 0.2<br>D. 0.02 | 16 RCA: 24% - C<br>TWA: A (41%)<br><br>N/A (76%) EP Buhande |
| 17. Change $\frac{123}{100}$ to a decimal number.<br>A. 0.23 B. 1.023<br>C. 1.23 D. 12.3 | 17 RCA: 24% - C<br>TWA: D (32%)<br><br>N/A (76%) EP Buhande |

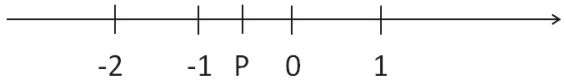
| | |
|---|---|
| 18. Calculate: 0.23 + 1.37<br><br>A. 0.7 B. 1.7<br>C. 1.6 D. 1.5 | 18 RCA: 45% - C<br>TWA: A (20%) and N/A (17%)<br><br>All EP Buhande pupils failed this question |
| 19. Calculate: $19.82 - 5.28$<br><br>A. 14.64 B. 14.54<br>C. 14.66 D. 14 | 19 RCA: 35% - B<br>TWA: C (34%)<br><br>N/A (81%) EP Buhande |
| 20. Change 1.25 metres to centimetres.<br><br>A. 12.5 cm B. 125 cm<br>C. 1250 cm D. 102.5 cm | 20 RCA: 24% - B<br>TWA: C (33%)<br><br>N/A (81%) EP Buhande |
| 21. Emmanuel gets 0.5 litres of tomato juice from 5 tomatoes. How many litres of the juice can he get from 15 tomatoes?<br><br>A. 1.5 litres B. 2 litres<br>C. 2.5 litres D. 3 litres | 21 RCA: 31% - A<br>TWA: C (27%)<br><br>All EP Buhande pupils failed this question |
| 22. A book contains 130 pages. Claudine read 78 pages of it. Which of the following shows the rest of the pages left?<br><br>A. 130 + 78 = ☐<br>B. ☐ – 78 = 130<br>C. $130 \div 78 =$ ☐<br>D. 130 – 78 = ☐ | 22 RCA: 8% - D<br>TWA: N/A (67%) |

| | |
|---|---|
| 23. About how long is this picture of a pencil?<br> <br>A.5 cm B. 10 cm C. 20 cm D. 30 cm | 23 RCA: 44% - A<br>TWA: B (26%) |
| 24. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6?<br>  <br><br>A. 12 B. 15 C. 18 D. 21 | 24 RCA: 39% - C<br>TWA: D (24%) |
| 25. Find the collect sign to compare the following number.<br>Seven hundred ☐ 617 + 83<br>A. =<br>B. ><br>C. <<br>D. None of the above | 25 RCA: 6% - A<br>TWA: N/A (40%), C (29%), B (23%) |
| 26. What is the distance between -3 and +6 on the number line?<br>  <br><br>A. 3 B. 9 C. -3 D. -9 | 26 RCA: 27% - B<br>TWA: C (20%) |
| 27. Study the diagram below and find the position of the top of the roof.<br>A. -5 m<br>B. 0 m<br>C. +5 m<br>D. +10 m<br>  <br> | 27 RCA: 68% - D<br>TWA: N/A (18%)<br><br>RCA (67%) EP Buhande succeeded |

| | |
|---|---|
| 28. Find the LCM of 12 and 15<br><br>A. 3 B. 27 C. 60 D. 180 | 28 RCA: 17% - C<br>TWA: B (28%) |
| 29. Evaluate $\sqrt{16}$<br><br>A. 3 B. 16 C. 4 D. | 29 RCA: 21% - C<br>TWA: B (25%), D (24%), N/A (23%) |
| 30. Calculate 5 m 25 cm – 1 m 40 cm<br><br>A. 4 m 15 cm B. 6 m 65 cm<br>C. 4 m 65cm D. 3 m 85 cm | 30 RCA: 24% - D<br>TWA: N/A (28%), C (23%), B (18%) |
| 31. Find the correct answer.<br>  <br>A. Basket A is the lightest.<br>B. Basket C is the heaviest.<br>C. Basket A is lighter than Basket B<br>D. Basket D is heavier than Basket C | 31 RCA: 11% - D<br>TWA: N/A (67%) |
| 32. What time is it?<br> <br>A. 1:15 B. 1:03<br>C. 3:01 D. 3:10 | 32 RCA: 24% - A<br>TWA: N/A (29%), B (25%) |
| 33. Choose right angled triangle.<br>  | 33 RCA: 3% - C<br>TWA: B (55%), N/A (30%) |

## S1 Mathematics

| | |
|---|---|
| 1. Calculate: 8x7<br><br>A. 42 B. 49 C. 56 D. 15 | 1 RCA: 99% - C |
| 2. Calculate : $4+4\div4-4$<br><br>A. 0 B. 1 C. 7 D. 8 | 2 RCA: 39% - B<br>TWA: C (29%)<br><br>Most of students in all schools do not master MDAS rule |
| 3. Simplify: 26 – 32 + 43<br><br>A. 29 B. 49 C. 37 D. 101 | 3 RCA: 58% - C<br><br>TWA: B (31%)<br><br>Meaning of negative number is lacking. |
| 4. Simplify: 23 – (– 42)<br><br>A. 29 B. 21 C. -19 D. 65 | 4 RCA: 72% - D<br><br>TWA: C (23%) |
| 5. Find the remainder of the following: $489\div37$<br><br>A. 5 B. 6 C. 7 D. 8 | 5 RCA: 32% - D<br>TWA: A (56%)<br><br>Students did not calculate, they just chose without thinking, because there is nowhere to find 5 as a remainder, or it may be lack of understanding what remainder means. |
| 6. The sum 691 + 208 is closest to the following sum<br><br>A. 600 + 200 B. 700 + 200 C. 700 + 300<br><br>D. 900 + 200 | 6 RCA: 39% - B<br>TWA: A (28%)<br><br>Difficulty in approximation |
| 7. Multiply : $-12\times(-25)$<br><br>A. 120 B. –240 C. –300 D. 300 | 7 RCA: 75% - D |
| 8. Subtract: 2.201 – 0.753<br><br>A. 1.448 B. 1.458 C. 1.548 D. 1.558 | 8 RCA: 93% - A |
| 9. Divide : $24.6\div0.04$<br><br>A. 0.615 B. 6.15 C. 61.5 D. 615 | 9 RCA: 79% - D |

| | |
|---|---|
| 10. Multiply: 0.203 by 0.56<br><br>A. 0.1288 B. 0.01288 C. 0.11368<br><br>D. 0.011368 | 10 RCA: 80% - C |
| 11. Calculate the following : $\frac{3}{8} \div \frac{3}{4}$<br>A. $\frac{9}{32}$ B. $\frac{1}{2}$ C. $\frac{3}{4}$ D. $-\frac{1}{2}$ | 11 RCA: 78% - B |
| 12. Simplify : $\frac{3}{4} + \left(\frac{2}{3} \times \frac{1}{4}\right)$<br>A. $\frac{1}{8}$ B. $\frac{5}{16}$ C. $\frac{5}{6}$ D. $\frac{11}{12}$ | 12 RCA: 61%- D<br>TWA: N/A (15%) |
| 13. Which of the following fractions is the smallest?<br>$\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}.$<br>A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$ | 13 RCA: 56% - A<br>TWA: C (21%) |
| 14. In which list of fractions are all of the fractions equivalent respectively?<br>A. $\frac{1}{2}, \frac{2}{4}, \frac{4}{6}$ B. $\frac{2}{3}, \frac{4}{6}, \frac{8}{12}$<br>C. $\frac{2}{5}, \frac{4}{10}, \frac{8}{50}$ D. $\frac{3}{4}, \frac{2}{4}, \frac{4}{6}$<br>E. $\frac{3}{4}, \frac{4}{6}, \frac{6}{8}$ | 14 RCA: 28% - B<br>TWA: N/A (25%), A (24%)<br><br>Lack of meaning of fraction |
| 15. What number does the letter P represent on the number line below?<br>  <br><br>A. $-\frac{3}{2}$ B. $-\frac{1}{2}$ C. $\frac{1}{2}$ D. $\frac{3}{2}$ | 15 RCA: 67% - B |
| 16. Change 35% to the simplest fraction.<br><br>A. $\frac{7}{2}$ B. $\frac{7}{20}$ C. $\frac{7}{200}$ D. $\frac{7}{2000}$ | 16 RCA: 71% - B |

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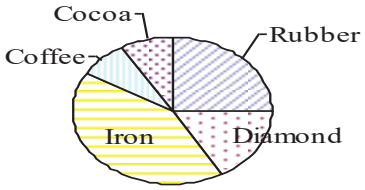
| 17. The pie graph below shows the main export of a country. What percentage of the shaded portion of the exports is rubber?<br>  <br><br>A. 10% B. 15% C. 20% D. 25% | 17 RCA: 26% - D<br>TWA: C (58%)<br><br>Lack of meaning of relationship between percentage and $360^0$ of cycle |
| 18. Find the value of $x$, if $12x - 10 = 6x + 32$<br><br>A. 5 B. 6 C. 7 D. 8 | 18 RCA: 81% - C |
| 19. If the ratio 7 to 13 is the same as the ratio x to 52, what is the value of x?<br><br>A. 7 B. 13 C. 28 D. 364 | 19 RCA: 46% - C<br><br>TWA: B (20%), N/A (17%)<br><br>Lack of proportionality skills |
| 20. An American tourist wants to change $30.00 American dollars to Rwandan francs. How much Rwf will he receive if $1.00 exchanges for 820 Rwf?<br><br>A. 246 Rwf B. 2,460 Rwf<br>C. 24,600 Rwf D. 820 Rwf | 20 RCA: 70% - C |
| 21. If $x$ is proportional to $y$ in the following table, find the value of $p$ and $q$ below.<br><br>$x$ \| 3 \| 6 \| $q$<br>$y$ \| 7 \| $p$ \| 35<br><br>A. $p = 14$, q = 31 B. $p = 10$, q = 14<br><br>C. $p = 10$, q = 31 D. $p = 14$, q = 15 | 21 RCA: 15% - D<br>TWA: N/A (28%)<br><br>Lack of proportionality skills |

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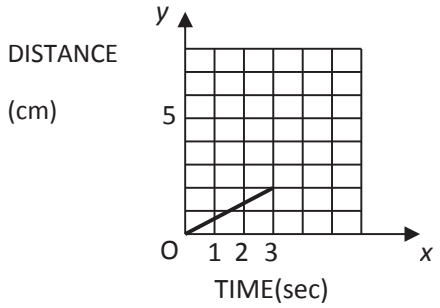
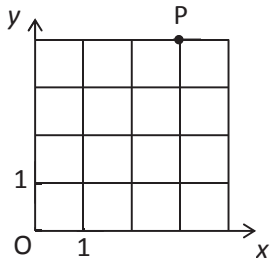
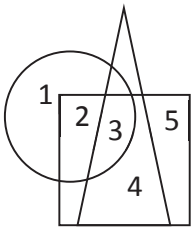
| 22. This graph shows how fast an ant walks along the straight line. If this ant keeps walking at the same speed as ever, what is the distance that this ant walks in 30 seconds?<br>  <br><br>A. 5cm B. 6cm C. 20cm<br>D. 25cm | 22 RCA: 25% - C<br>TWA: B (35%)<br><br>Lack of Problem solving skills |
| 23. The table represents a relation between $x$ and $y$. What is the missing number in the table?<br><br>A. 9<br>B. 10<br>C. 11<br>D. 12<br><br>$x$ \| $y$<br>2 \| 5<br>3 \| 7<br>4 \| ?<br>7 \| 15 | 23 RCA: 76% - A |
| 24. What are the coordinates of point P?<br><br>A. (3, 4)<br>B. (4, 3)<br>C. (–3, 4)<br>D. (3, –4)<br><br>  <br> | 24 RCA: 59% - A<br>TWA: B (28%) |
| 25. In the figure below, which number belongs to the square, the circle and not to the triangle?<br><br>A. 1<br>B. 2<br>C. 3<br>D. 4<br>E. 5<br><br>  <br> | 25 RCA: 51% - B<br>TWA: N/A (25%) |
| 26. Which is the smallest number among the following?<br>700mm, 6cm, 0.15m, 0.002km<br><br>A. 700mm B. 6cm C. 0.15m D. 0.002km | 26 RCA: 23% - B<br>TWA: A (36%), D (30%)<br><br>Lack of measurement conversion skills |

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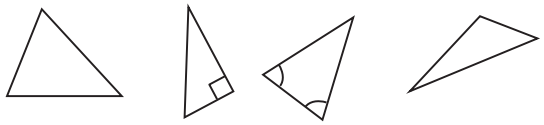
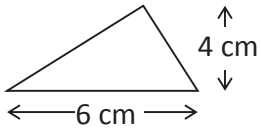
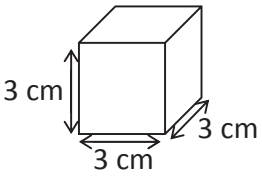
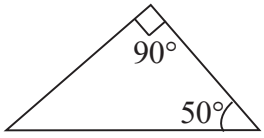
| 27. Which of the following is the closest to the value of<br>$\pi : \frac{\text{circumference}}{\text{diameter}}$ ?<br><br>A. 1.5 B. 2.1 C. 3.1 D. 4.1 | 27 RCA: 37% - C<br>TWA: N/A (20%)<br><br>Lack of geometric skills |
| 28. Which of the following is an isosceles triangle?<br><br>A. B. C. D.<br>  | 28 RCA: 36% - C<br>TWA: A (24%)<br><br>Lack of geometric knowledge |
| 29. The car is 3.5m long. About how long is the building?<br><br> <br>A. 18m B. 14m C. 10m<br>D. 4m | 29 RCA: 31% - B<br>TWA: C (26%)<br><br>Lack of critical thinking |
| 30. Which of the following is the area of a triangle whose base and height are 6 cm and 4 cm respectively?<br><br>A. 10 $cm^2$<br>B. 12 $cm^2$<br>C. 24 $cm^2$<br>D. 10 cm<br><br>  | 30 RCA: 50% - B<br>TWA: C (42%) |
| 31. What is the volume of the cube below?<br><br>A. 9 $cm^3$<br>B. 18 $cm^3$<br>C. 27 $cm^3$<br>D. 64 $cm^3$<br><br>  | 31 RCA: 78% - C |
| 32. What is $\angle ABC$ in the triangle below?<br><br>A. 20°<br>B. 40°<br>C. 50°<br>D. 80°<br><br>  | 32 RCA: 69% - B |

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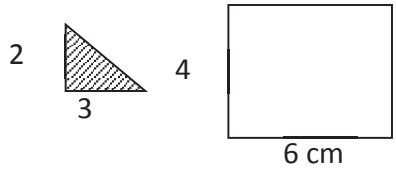
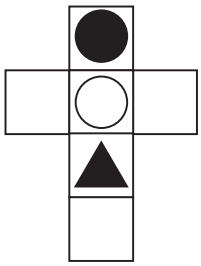
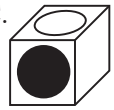
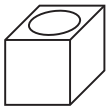
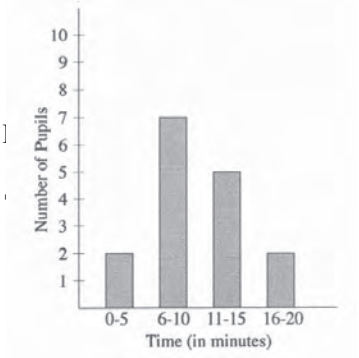
| 33. How many of the shaded right-angled triangles below are needed to cover exactly the surface of the given rectangle?<br>  <br><br>A. Four<br>B. Six<br>C. Eight<br>D. Ten | 33 RCA: 17% - C<br>TWA: A (36%), B (26%)<br><br>Lack of geometric operation skills |
| 34. Which of the following cubes could be made by folding the figure below?<br>  <br>A. <br>B. <br>C.  <br>D.  | 34 RCA: 8.3% - C<br>TWA: A (33%), B (29%)<br><br>Lack of analytical skills |
| 35. Find the highest common factor (HCF) and the least common multiple (LCM) of 12 and 18.<br><br>A. HCF = 4, LCM = 36 B. HCF = 6, LCM = 36<br><br>C. HCF = 6, LCM = 48 D. HCF = 8, LCM = 48 | 35 RCA: 48% - B<br>TWA: N/A (20%)<br><br>Lack of factor and multiples concept |
| 36. The graph shows the time of travel by students from home to school. How many students must travel for MORE THAN 10 minutes?<br>  <br><br>A. 2<br>B. 5<br>C. 7<br>D. 8<br>E. 15 | 36 RCA: 37% - C<br>TWA: N/A (24%)<br><br>Lack of problem solving skills |

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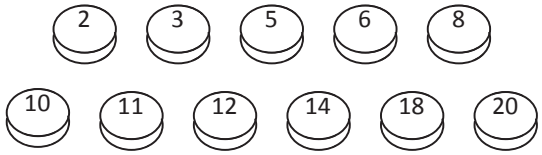
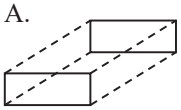
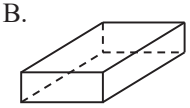
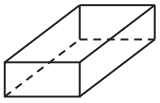
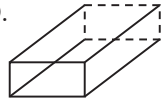
| 37. The eleven chips below are placed in a bag and mixed. Emmanuel draws one chip from the bag without looking. What is the probability that Emmanuel draws a chip with a number that is a multiple of three?<br>  <br><br>A. $\frac{1}{11}$ B. $\frac{1}{3}$ C. $\frac{4}{11}$ D. $\frac{3}{11}$ | 37 RCA: 22%- D<br>TWA: B (33%), N/A (22%)<br><br>Lack of probability concept |
| 38. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6?<br> <br><br>A. 12 B. 15 C. 18 D. 36 | 38 RCA: 47% - C<br>TWA: N/A (22%)<br><br>Lack of critical thinking |
| 39. How many Common Multiples of 2 and 3 are between 1 and 20?<br><br>A. 1 B. 3 C. 6 D. 10 | 39 RCA: 24% - B<br><br>TWA: C (33%), N/A (21%)<br><br>Lack of factor and multiples concept |
| 40. Which of the dotted lines in the shapes drawn below show the hidden edges of the cuboid?<br>A.<br>  <br>B.<br>  <br>C.<br>  <br>D.<br>  | 40 RCA: 29% - B<br>TWA: N/A (24%), A (24%)<br><br>Lack of observation, drawing and analytical skills |

## S4 Mathematics

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| 1. Multiply : $302 \times 50$<br>A. 1600 B. 1510<br>C. 1510 D. 15100 | 1 RCA: 89% - D<br>TWA: C (8%)<br>In LNDV, all students performed this item 100%. |
| 2. Calculate: $4 + 4 \div 4 - 4$<br>A. 0 B. 1<br>C. 7 D. 8 | 2 RCA: 34% - B<br>TWA: A (44%) D (11% )<br>N/A (10%)<br>Students fail due to lack of knowledge under mathematical properties A&D |
| 3. Simplify: 26 – 32 + 43<br>A. 29 B. 49<br>C. 37 D. 101 | 3 RCA: 70% - C<br>TWA: B (26%) |
| 4. Simplify: 23 – (– 42)<br>A. 29 B. 21<br>C. -19 D. 65 | 4 RCA: 93% - D |
| 5. Find the remainder of the following: $489 \div 37$<br>A. 5 B. 6<br>C. 7 D. 8 | 5 RCA: 61% - D<br>TWA: N/A (23%) |
| 6. Multiply: $-12 \times (-25)$<br>A. 120 B. –240<br>C. –300 D. 300 | 6 RCA: 92% - D |
| 7. Subtract: 2.201 – 0.753<br>A. 1.448 B. 1.458<br>C. 1.548 D. 1.558 | 7 RCA: 92% - A |
| 8. Divide: $24.6 \div 0.04$<br>A. 0.615 B. 6.15<br>C. 61.5 D. 615 | 8 RCA: 74% - D<br>TWA: C (8%) |

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| 9. Multiply: 0.203 by 0.56<br>A. 0.1288 B. 0.01288<br>C. 0.11368 D. 0.011368 | 9 RCA: 82%- C<br>TWA: N/A (8%) |
| 10. Calculate the following: $\frac{3}{8} \div \frac{3}{4}$<br>A. $\frac{9}{32}$ B. $\frac{1}{2}$<br>C. $\frac{3}{4}$ D. $-\frac{1}{2}$ | 10 RCA: 83%- B<br>TWA: A (7%) |
| 11. Simplify: $\frac{3}{4}+\left(\frac{2}{3}\times\frac{1}{4}\right)$<br>A. $\frac{1}{8}$ B. $\frac{5}{16}$<br>C. $\frac{5}{6}$ D. $\frac{11}{12}$ | 11 RCA: 81% - D<br>TWA: A (5%) , B (5%) |
| 12. Which of the following fractions is the smallest? $\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}$.<br>A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$ | 12 RCA: 73% - A<br>TWA: D (11%) |
| 13. In which list of fractions are all of the fractions equivalent respectively?<br>A. $\frac{1}{2}, \frac{2}{4}, \frac{4}{6}$ B. $\frac{2}{3}, \frac{4}{6}, \frac{8}{12}$<br>C. $\frac{2}{5}, \frac{4}{10}, \frac{8}{50}$ D. $\frac{3}{4}, \frac{2}{4}, \frac{4}{6}$ E. $\frac{3}{4}, \frac{4}{6}, \frac{6}{8}$ | 13 RCA: 47% - B<br>TWA: A (20%)<br>N/A (19%) |
| 14. What number does the letter P represent on the number line below?<br>A. $-\frac{3}{2}$ B. $-\frac{1}{2}$<br>C. $\frac{1}{2}$ D. $\frac{3}{2}$<br> | 14 RCA: 81% - B<br>TWA: A (8%) |

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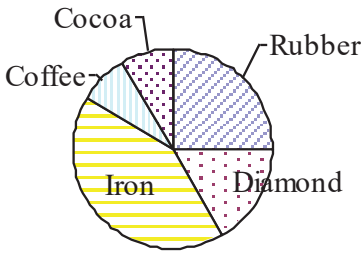
| 15. If the ratio 7 to 13 is the same as the ratio $x$ to 52, what is the value of $x$?<br>A. 7 B. 13 C. 28 D. 364 | 15 RCA: 46% - C (Highest)<br>TWA: B (16%)<br>N/A (21%) |
| 16. Change 35% to the simplest fraction.<br>A. $\frac{7}{2}$ B. $\frac{7}{20}$<br>C. $\frac{7}{200}$ D. $\frac{7}{2000}$ | 16 RCA: 81%<br>TWA: C (9%) |
| 17. The pie graph below shows the main export of a country. What percentage of the shaded portion of the exports is rubber?<br>  <br><br>A. 10% B. 15% C. 20% D. 25% | 17 RCA: 34% -D<br>TWA: C (45%)<br>N/A (11%) |
| 18. If a, b and c are different real numbers, then which of the following is true?<br>A. $a - b = b - a$ B. $a(b - c) = b(c - a)$<br>C. $b - c = c - b$ D. $ab = ba$ | 18 RCA: 52% - D<br>TWA: B (28%)<br>N/A (7%) |
| 19. Find the value of $x$, if $12x - 10 = 6x + 32$.<br>A. 5 B. 6 C. 7 D. 8 | 19 RCA: 91% - C |
| 20. An American tourist wants to change $30.00 American dollars to Rwandan francs. How much Rwf will he receive if $1.00 exchanges for 820 Rwf?<br>A. 246 Rwf B. 2,460 Rwf<br>C. 24,600 Rwf D. 820 Rwf | 20 RCA: 75% - C<br>TWA: D (9%)<br>N/A (7%) |

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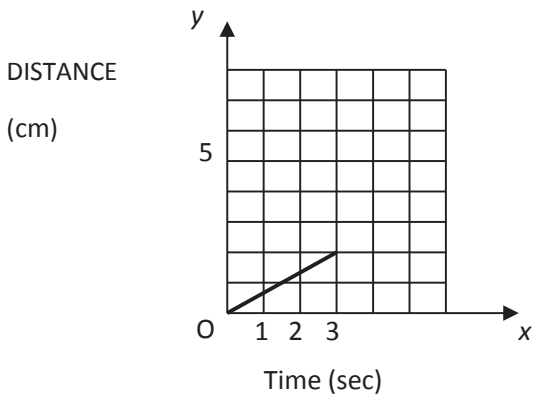
| 21. If $x$ is proportional to $y$ in the following table, find the value of $p$ and $q$ below.<br><br>$x$ \| 3 \| 6 \| $q$<br>$y$ \| 7 \| $p$ \| 35<br><br>A. $p = 14,\ q = 31$ B. $p = 10,\ q = 14$<br>C. $p = 10,\ q = 31$ D. $p = 14,\ q = 15$ | 21 RCA: 35% - D<br>TWA: C (19%), B (13%), A (8%)<br>N/A (20%) |
| 22. This graph shows how fast an ant walks along the straight line. If this ant keeps walking at the same speed as ever, what is the distance that this ant walks in 30 seconds?<br><br>  <br><br><br>A. 5cm B. 6cm C. 20cm D. 25cm | 23 RCA: 34% - C<br>TWA: B (24%), A (12%)<br>N/A (19%) |
| 23. The table represents a relation between $x$ and $y$. What is the missing number in the table?<br><br>A. 9<br>B. 10<br>C. 11<br>D. 12<br><br>$x$ \| $y$<br>2 \| 5<br>3 \| 7<br>4 \| ?<br>7 \| 15 | 23 RCA: 52% - A<br>TWA: C (19%), A (10%)<br>N/A (12%) |
| 24. Calculate $\frac{1}{6}x^2 - \frac{1}{3}x - 1 = 0$<br><br>A. $\pm 3$ B. $1 + \sqrt{7}$ C. $1 \pm \sqrt{7}$ D. $1 \pm \sqrt{6}$ | 24 RCA: 18% - C<br>TWA: A (17%), B (14%), D (15%)<br>N/A (32%) |

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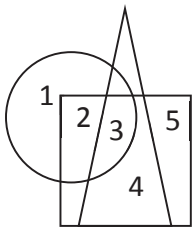
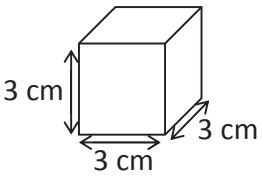
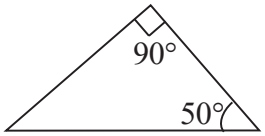
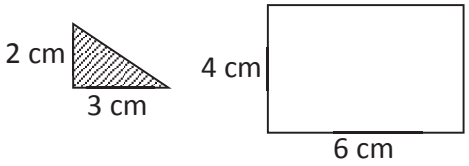
| 25. In the figure below, which number belongs to the square, the circle and not to the triangle?<br>A. 1<br>B. 2<br>C. 3<br>D. 4<br>E. 5<br>  | 25 RCA: 64% - B<br>TWA: A (12%)<br>N/A (4%) |
| 26. Which is the smallest number among the following?<br>700mm, 6cm, 0.15m, 0.002km<br>A. 700mm B. 6cm C. 0.15m D. 0.002km | 26 RCA: 24% - B<br>TWA: A (35%) D (21%)<br>N/A (10%) |
| 27. Which of the following is equivalent to $\frac{7}{6}\pi$<br>A. 30° B. 70° C. 120° D. 210° | 27 RCA: 37% - D<br>TWA: C (17%) B (12%) and A (10%)<br>N/A (22%) |
| 28. What is the volume of the cube below?<br>A. 9 $cm^3$<br>B. 18 $cm^3$<br>C. 27 $cm^3$<br>D. 64 $cm^3$<br>  | 28 RCA: 64% - C<br>TWA: B (16%)<br>N/A (10%) |
| 29. What is ∠ABC in the triangle below?<br>A. 20°<br>B. 40°<br>C. 50°<br>D. 80°<br>  | 29 RCA: 73% - B<br>TWA: 5% -A, 4% -C, D<br>N/A (10%) |
| 30. How many of the shaded right-angled triangles below are needed to cover exactly the surface of the given rectangle?<br>A. Four<br>B. Six<br>C. Eight<br>D. Ten<br>  | 30 RCA: 16% - C<br>TWA: A (38%) B (27%)<br>N/A (13%) |

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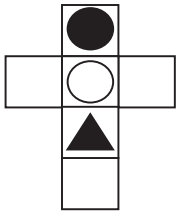
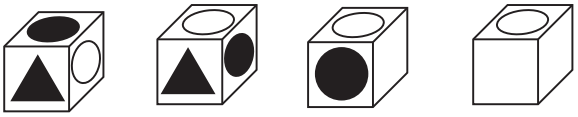
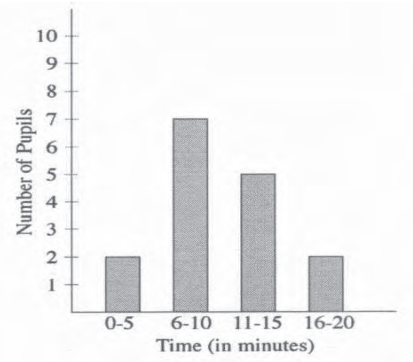
| 31. Which of the following cubes could be made by folding the figure below?<br>  <br>A. B. C. D.<br>  | 31 RCA: 10% - C<br>TWA: B (32%) A (30%)<br>N/A (26%)<br>This item was the poorest performed.<br>They are confused by B and C as either choice or shape |
| 32. Find the highest common factor (HCF) and the least common multiple (LCM) of 12 and 18.<br>A. HCF = 4, LCM = 36 B. HCF = 6, LCM = 36<br>C. HCF = 6, LCM = 48 D. HCF = 8, LCM = 48 | 32 RCA: 44% -B<br>TWA: A (12%) C (12%)<br>N/A (24%) |
| 33. The graph shows the time of travel by students from home to school. How many students must travel for MORE THAN 10 minutes?<br>  <br><br>A.2 B.5 C.7 D.8 E.15 | 33 RCA: 33% - C<br>TWA: B (20%) A (10%) D (10%)<br>N/A (20%) |
| 34. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6?<br> <br><br>A. 12 B. 15 C. 18 D. 36 | 34 RCA: 46% - C<br>TWA: D (13%) , A (8%) , C (8%)<br>N/A (22%) |

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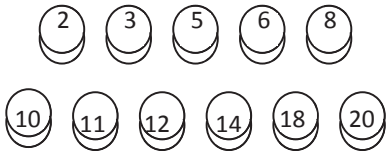
| 35. The eleven chips below are placed in a bag and mixed. Emmanuel draws one chip from the bag without looking. What is the probability that Emmanuel draws a chip with a number that is a multiple of three?<br>  <br><br>A. $\frac{1}{11}$ B. $\frac{1}{3}$ C. $\frac{4}{11}$ D. $\frac{3}{11}$ | 35 RCA: 15% - C<br>TWA: B (22%), D (16%) , A (8%)<br>N/A (38%) |
| 36. You are given the following sets;<br>A = {x: x is a multiple of 2 less than 20}, B = {x: x is a multiple of 3 less than 20}<br>How many elements are there inA ∩ B?<br>A. 1 B. 3 C. 6 D. 10 | 36 RCA: 20% - B<br>TWA: C (28%), D (11%)<br>N/A (32%) |
| 37. Factorise the following: $9x^2 - 25$<br>A. $(3x + 5)^2$ B. $(3x - 5)^2$<br>C. $(3x + 5)(3x - 5)$ D. $x(9x - 25)$ | 37 RCA: 47% - C<br>TWA: B (15%)<br>N/A (26%) |
| 38. Two vectors are such that $\boldsymbol{a} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$, $\boldsymbol{b} = \begin{pmatrix} 3+k \\ 4+t \end{pmatrix}$.<br>If $a = b$, find the values of $k$ and $t$.<br>A. $k = 0$, $t = 0$<br>B. $k = -1$, $t = 1$<br>C. $k = 1$, $t = -1$<br>D. $k = 4$, $t = 3$ | 38 RCA: 33% - C<br>TWA: B (11%)<br>N/A (36%) |
| 39. The three sides of a right-angled triangle are x, x+1 and 5. Find x, if the longest side is 5.<br>A. x = 5 B. x = -4, 3 C. x = 3 D. x = 1 | 39 RCA: 25% - C<br>TWA: B (13%) D (11%)<br>N/A (43%) |

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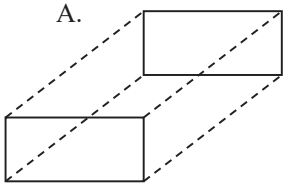
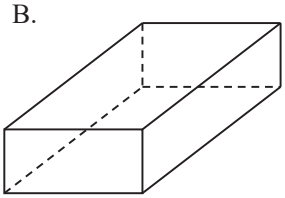
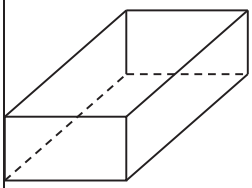
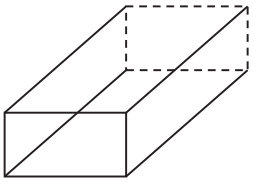
| 40. Which of the dotted lines in the shapes drawn below show the hidden edges of the cuboid?<br>A.<br>  <br>B.<br>  <br>C.<br>  <br>D.<br>  | 40 RCA: 26% - B<br>TWA: A (19%)<br>N/A (34%) |

## P4 Science

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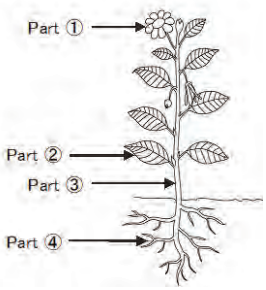
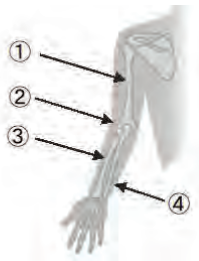
| 1. Which one is a living thing?<br> <br>Sun A. Rock B. Tree C. Water D. | 1 RCA: 34% - C<br>TWA: D (27%)<br>EP Buhande records highest correct answer rate of 48% |
| 2. A snail is a living thing.<br>Which is a wrong explanation about it?<br>A. A snail change its size.<br>B. A snail moves.<br>C. A snail does not reproduce its children.<br>D. A snail needs food.<br> <br>Snail | 2 RCA: 13% - C<br>TWA: M (More than One Answer) (32%), and B(22%)<br>Generally, students performed poorly when they choose one wrong explanation. |
| The diagram shows flowering plants.<br>3. What is the name of part ④?<br>A. Flower<br>B. Stem<br>C. Leaf<br>D. Root<br>4. Which part absorbs water from the soil?<br>A. part ①<br>B. part ②<br>C. part ③<br>D. part ④<br>  <br>Part ①<br>Part ②<br>Part ③<br>Part ④ | 3 RCA: 43% - D<br>TWA: N/A (19%)<br>Question sentence was not well understood by students. |
| 4. Which part absorbs water from the soil?<br>A. part ①<br>B. part ②<br>C. part ③<br>D. part ④ | 4 RCA: 44% - D<br>TWA: N/A (22%) |
| 5. Which one is an important thing for plant growth?<br>A. Electricity<br>B. Sunlight<br>C. Oil<br>D. Salt | 5 RCA: 52% - B<br>TWA: N/A (12%) |
| 6. The diagram shows bones of right arm and hand.<br>You can bend your arm at the joint.<br>Which part is the joint of arm?<br>A. ①<br>B. ②<br>C. ③<br>D. ④<br>  <br>① ② ③ ④ | 6 RCA: 53% - B<br>TWA: A (12%)<br>EP Buhande records highest correct answer rate of 48% |
| 7. Which of the followings is **NOT Correct** on the explanation of Animals?<br>A. Vertebrate has five categories namely fish, amphibian, reptiles, birds and mammal.<br>B. Invertebrate animals do not have backbone.<br>C. Mammals have udder.<br>D. All domestic animals are mammals. | 7 RCA: 7% - D<br>TWA: N/A (40%)<br>Students performed Worst correct answer rate, in particular EP Buhande has 0%. |

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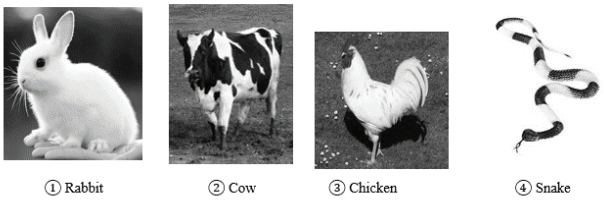
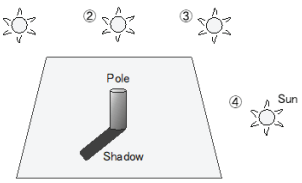
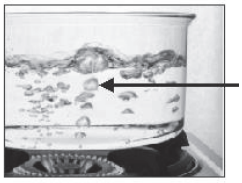
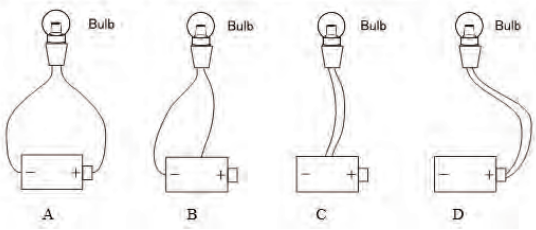
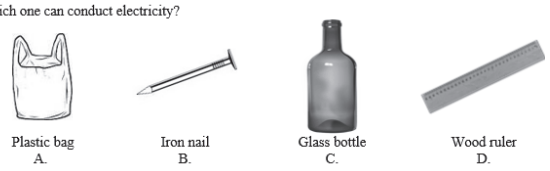
| 8. Which animal(s) belong to mammal?<br>  <br>① Rabbit ② Cow ③ Chicken ④ Snake<br>A. ① is mammal.<br>B. ① and ② are mammal.<br>C. ①, ② and ③ are mammal.<br>D. ①, ②, ③ and ④ are mammal. | 8 RCA: 33% - B<br>TWA: N/A (33%)<br>Some students thought only cow belongs to mammal, then, they did not pick any choice. EP Buhande records highest correct answer rate of 48% |
| 9. Shadow of pole is formed on the ground. Where does the Sun locate at?<br>A. ①<br>B. ②<br>C. ③<br>D. ④<br>  <br> | 9 RCA: 15% - C<br>TWA: D (33%) |
| 10. The moon does not give off its own light. Why can you see the Moon?<br>A. It bends light from the Sun.<br>B. It gets through light from the Sun.<br>C. It takes in light from the Sun.<br>D. It reflects light from the Sun. | 10 RCA: 31% - D<br>TWA: N/A (25%), followed by A (16%) |
| 11. In the photo, water is boiling. What is in the bubbles of boiling water?<br>A. Air<br>B. Ice<br>C. Water vapour<br>D. Glass<br>  | 11 RCA: 37% - C<br>TWA: B (18%), followed by A (14%) |
| 12. Which diagram shows the connection that can make the bulb light?<br>  <br> | 12 RCA: 55% - A<br>TWA: B (12%)<br>In EP Buhande, choice of "No Answer" increased from this question. |
| 13. Which one can conduct electricity?<br>  <br>Plastic bag A. Iron nail B. Glass bottle C. Wood ruler D. | 13 RCA: 46% - B<br>TWA: C (21%) |

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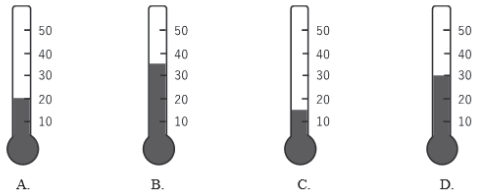
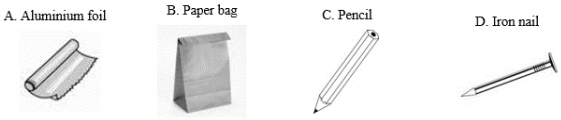
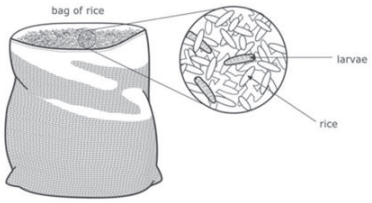
| 14. Which one is a **Wrong** explanation about sound?<br>A. Sound does not travel through water.<br>B. Sound travels through air.<br>C. Sound travels through wall.<br>D. Sound travels through human body. | 14 RCA: 14% - A<br>TWA: B (30%), followed by "No Answer" (27%)<br>None of EP Buhande students scored. |
| 15. Which thermometer reading shows the hottest?<br>  <br> | 15 RCA: 68% - B<br>TWA: N/A (12%) |
| 16. Which of the following is attracted by a magnet?<br>  <br> | 16 RCA: 62% - D<br>TWA: N/A (14%)<br>EP Buhande performed poorly – score 19% only. |
| 17. Which of the following statements is NOT correct about types of Food?<br>A. Fruit and Vegetables keep us hungry.<br>B. Dairy (milk) products make our bones strong.<br>C. Grains (or cereals) give us energy.<br>D. Meat helps us grow and makes us strong. | 17 RCA: 18% - A<br>TWA: N/A (25%) followed by "more than one choice" (22%)<br>In particular, 76% of EP Buhande students did not write anything. |
| 18. Larvae were found in a bag of rice. What best explains the larvae got there?<br>  <br><br>A. They came from water in the bag.<br>B. They came from air in the bag.<br>C. They came from the rice itself.<br>D. They came from eggs laid by insects. | 18 RCA: 25% - D<br>TWA: N/A (22%)<br>62% of EP Buhande students did not write anything. |

## S1 Science

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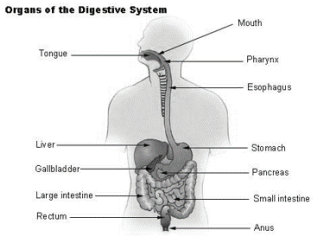
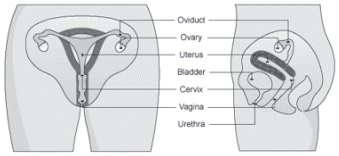
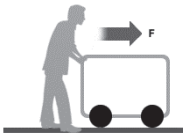
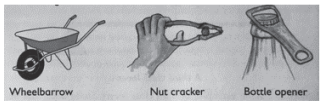
| ***Question 1***<br>Digestion is the process by which food is broken into simple substances which can be used by the body. It is an important process because it allows the body to get useful nutrients from the food that we eat. In which organ do we absorb important nutrition such as amino acids and glucose?<br>A. stomach<br>B. small intestine<br>C. large intestine<br>D. liver<br>  | 1 RCA: 34% - B<br>TWA: A (40%) |
| ***Question 2***<br>The figure below shows the female reproductive system. In which organ does fertilization take place?<br>A. ovary<br>B. oviduct<br>C. uterus<br>D. cervix<br>  | 2 RCA: 42% - B<br>TWA: C (36%) |
| ***Question 3***<br>Which of the following foods is correctly matched to its group?<br>A. ground nuts → energy giving<br>B. eggs → protective<br>C. carrots → energy giving<br>D. bananas → body building | 3 RCA: 23% - A<br>TWA: C (35%) |
| ***Question 4***<br>Which one of the following is the most effective preventive measure against the spread of sexually transmitted infections amongst the youth in schools?<br>A. seeking medical attention<br>B. use of condoms<br>C. circumcision<br>D. taking a shower daily | 4 RCA: 55% - B<br>TWA: C (17%) |
| ***Question 5***<br>A force of 20N pushes a box 5m in the direction of the force. Calculate the work done.<br>A. 4 N/m<br>B. 15 Nm<br>C. 25 Nm<br>D. 100 Nm<br>  | 5 RCA: 61% - D<br>TWA: A (31%) |
| ***Question 6***<br>When suspended freely, a magnet always faces<br>A. Up-Down direction<br>B. North-South direction<br>C. West-East direction<br>D. Free direction<br> | 6 RCA: 75% - B<br>TWA: D (14%) |
| ***Question 7***<br>Below are some examples of second class levers. Which statement for the second class levers is correct?<br>  <br>A. the load lies in between the effort and the fulcrum.<br>B. the fulcrum is always between the load and the effort.<br>C. the effort lies in between the load and the fulcrum.<br>D. it can be categorized into wheel, screws and gears. | 7 RCA: 63% - A<br>TWA: B (21%) |

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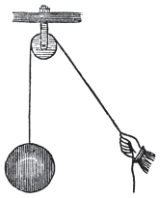
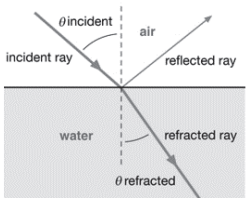
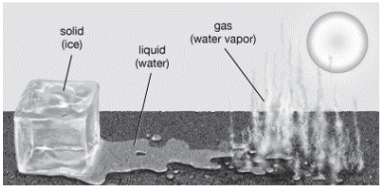
| ***Question 8***<br>If you have a mixture of iron filings and sand, how can you separate them?<br>A. put them in water and boil them to remove sand<br>B. use magnet to attract iron filings<br>C. use filter to collect sand only<br>D. burn them to remove iron filings and cool them down | 8 RCA: 76% - B<br>TWA: C (12%) |
| ***Question 9***<br>Which one of the following consists of only materials that are ALL non-magnetic?<br>A. aluminium foil, piece of paper<br>B. iron nails, plastic bottle<br>C. piece of glass, sewing needle<br>D. steel wool, water | 9 RCA: 28% - A<br>TWA: D (45%) |
| ***Question 10***<br>Which statement on the single fixed pulley is NOT correct?<br>A. it is made up of only one pulley which is fixed<br>B. it reduces the effort needed and it changes the direction of the force<br>C. effort distance is equal to the load distance<br>D. it enables us to raise a load much higher than the person doing it<br>  | 10 RCA: 21% - B<br>TWA: C (35%) |
| ***Question 11***<br>Below is the diagram of incident ray, refracted ray and reflected ray at the boundary of air and water. Which statement is correct?<br>A. angle of incident is equal to angle of refraction<br>B. angle of incident is bigger than angle of refraction<br>C. angle of incident is smaller than angle of refraction<br>D. angle of reflection is equal to angle of refraction<br>  | 11 RCA: 22% - B<br>TWA: A (57%) |
| ***Question 12***<br>What do you call the process of the change of the states from gas to liquid?<br>A. evaporation<br>B. melting<br>C. condensation<br>D. sublimation<br>  | 12 RCA: 68%- C<br>TWA: A (14%) |
| ***Question 13***<br>Which statement on the inclined plane is NOT correct?<br>A. it is also known as a slope<br> | 13 RCA: 23% - D<br>TWA: C (32%)<br>Secondary school students also perform poorly when identifying an incorrect answer. |

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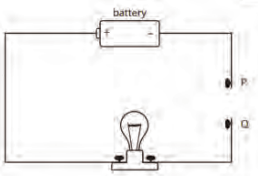
| ***Question 1***<br>Bacteria that enter the body are destroyed by which type of cells?<br>A. white blood cells<br>B. red blood cells<br>C. kidney cells<br>D. lung cells | 14 (B1) RCA: 64% - A<br>TWA: B (25%)<br>Note: TIMSS 2011(G8) Avr. 61% |
| ***Question 2***<br>Many seeds can germinate in the light or in the dark. State two conditions necessary for germination.<br>A. Water and Air<br>B. Soil and Water<br>C. Sun light and Air<br>D. Germ and Soil | 15 (B2) RCA: 34% - A<br>TWA: C (27%)<br>Note: TIMSS 2011(G8) Avr. 21%<br>Plants germination needs Water, Oxygen and suitable Temperature |
| ***Question 3***<br>The following table shows the classification of some animals into two categories.<br>Category 1: Rabbit, Giraffe, Elephant<br>Category 2: Frog, Spider, Lion<br>Which of the following was used to classify these animals?<br>A. organs used in breathing<br>B. food source<br>C. method of reproduction<br>D. pattern of movement | 16 (B3) RCA: 35% - B<br>TWA: A (32%)<br>Note: TIMSS 2011(G8) Avr. 49% |
| ***Question 4***<br>What happens to the particles (molecules) of a liquid when the liquid cools?<br>A. They slow down.<br>B. They speed up.<br>C. They decrease in number.<br>D. They decrease in size. | 17 (B4) RCA: 34% - A<br>TWA: B (25%)<br>Note: TIMSS 2011(G8) Avr. 58% |
| ***Question 5***<br>Rods made of different materials are connected between points P and Q in the circuit diagram shown below.<br>Which rod would cause the bulb to light?<br>A. copper rod<br>B. wood rod<br>C. glass rod<br>D. plastic rod<br>  | 18 (B5) RCA: 71% - A<br>TWA: D (11%)<br>Note: TIMSS 2011(G8) Avr. 88% |
| ***Question 6***<br>A student sets up an investigation to test the strength of magnets. He has several magnets of different sizes, shapes, and masses. He uses the magnets to lift metal paper clips. How is the strength of a magnet defined in the investigation?<br>A. by the mass of the magnet lifting the metal paper clips<br>B. by the size of the magnet lifting the metal paper clips<br>C. by the number of metal paper clips lifted by the magnet<br>D. by the time the metal paper clips stay on the magnet | 19 (B6) RCA: 23% - C<br>TWA: A (26%), B (24%), D (23%)<br>Note: TIMSS 2011(G8) Avr. 42% |

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| ***Question 7***<br>An object has a density of 1.1 g/cm³. Liquid X, Y and Z have a density of 1.3 g/cm³, 0.9 g/cm³ and 1.2 g/cm³, respectively. In which liquid would this object float?<br>A. Liquid X<br>B. Liquid Y<br>C. Liquid Z<br>D. Liquid X and Z | 20 (B7) RCA: 19% - D<br>TWA: B (55%)<br>Note: TIMSS 2011(G8) Avr. 31% |
| ***Question 8***<br>Which diagram shows the position of the Sun (S), moon (M), and Earth (E) during an eclipse of the moon? (Not drawn to scale)<br> | 21 (B8) RCA: 31% - D<br>TWA: A (52%)<br>Note: TIMSS 2011(G8) Avr. 35% |
| ***Question 9***<br>Some volcanic rocks have many holes in them.<br>How were the holes made?<br>A. Insects dug into the rock when it was soft.<br>B. Gas bubbles were trapped in the rock when it cooled.<br>C. Rain dropped on the rock when it was soft.<br>D. Small stones fell out of the rock when it cooled.<br> | 22 (B9) RCA: 43% - B<br>TWA: D (35%)<br>Note: TIMSS 2011(G8) Avr. 57% |
| ***Question 10***<br>Which statement is NOT correct on how you can you make use of computer at school or at home?<br>A. Writing documents<br>B. Drawing pictures<br>C. Cooking breakfast<br>D. Searching information | 23 (B10) RCA: 73% - C<br>TWA: D (17%)<br>This is an easy question if students have ever touched computers |
| ***Question 11***<br>How often have you used laptop computers at your school or at home.<br>A. Almost everyday<br>B. Once in a week<br>C. Once in a month<br>D. Never used | 24 (B11) : 100% - ABCD<br>A (21%), B (73%), C (4%), D (2%)<br>This question is intended to know how often the students use computers and students got a mark as long as they answered.<br>Positivo-Laptop PC (Windows) has been distributed in the three schools. |
| ***Question 12***<br>Calculate the volume of a body with 0.8 g/cm³ and 240g.<br>A. 192 cm³<br>B. 239.2 cm³<br>C. 240.8 cm³<br>D. 300 cm³ | 25 (B12) RCA: 53% - D<br>TWA: A (35%)<br>This is a question of Primary level mathematics. |

## S4 Science

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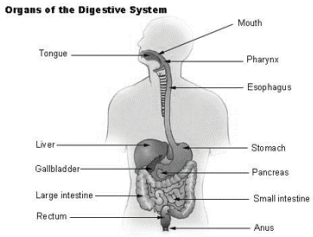
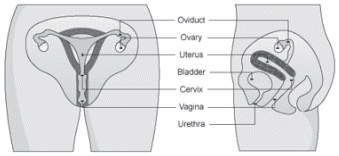
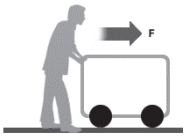
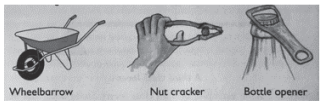
| ***Question 1***<br>Digestion is the process by which food is broken into simple substances which can be used by the body. It is an important process because it allows the body to get useful nutrients from the food that we eat. In which organ do we absorb important nutrition such as amino acids and glucose?<br>A. stomach<br>B. small intestine<br>C. large intestine<br>D. liver<br>  | 1 RCA: 46% - B<br>TWA: A (35%) |
| ***Question 2***<br>The figure below shows the female reproductive system. In which organ does fertilization take place?<br>A. ovary<br>B. oviduct<br>C. uterus<br>D. cervix<br>  | 2 RCA: 52% - B<br>TWA: C (25%) |
| ***Question 3***<br>Which of the following foods is correctly matched to its group?<br>A. ground nuts → energy giving<br>B. eggs → protective<br>C. carrots → energy giving<br>D. bananas → body building | 3 RCA: 23% - A<br>TWA: B (43%) |
| ***Question 4***<br>Which one of the following is the most effective preventive measure against the spread of sexually transmitted infections amongst the youth in schools?<br>A. seeking medical attention<br>B. use of condoms<br>C. circumcision<br>D. taking a shower daily | 4 RCA: 54% - B<br>TWA: C (14%) |
| ***Question 5***<br>A force of 20N pushes a box 5m in the direction of the force. Calculate the work done.<br>A. 4 N/m<br>B. 15 Nm<br>C. 25 Nm<br>D. 100 Nm<br>  | 5 RCA: 74% - D<br>TWA: A (18%) |
| ***Question 6***<br>When suspended freely, a magnet always faces<br>A. Up-Down direction<br>B. North-South direction<br>C. West-East direction<br>D. Free direction<br> | 6 RCA: 71% - B<br>TWA: D (13%) |
| ***Question 7***<br>Below are some examples of second class levers. Which statement for the second class levers is correct?<br>  <br>A. the load lies in between the effort and the fulcrum.<br>B. the fulcrum is always between the load and the effort.<br>C. the effort lies in between the load and the fulcrum.<br>D. it can be categorized into wheel, screws and gears. | 7 RCA: 58% - A<br>TWA: B (18%) |

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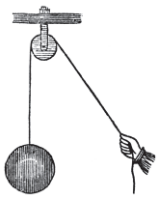
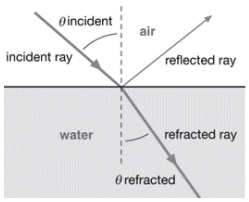
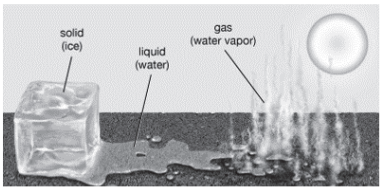
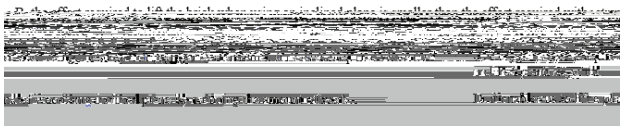
| ***Question 8***<br>If you have a mixture of iron filings and sand, how can you separate them?<br>A. put them in water and boil them to remove sand<br>B. use magnet to attract iron filings<br>C. use filter to collect sand only<br>D. burn them to remove iron filings and cool them down | 8 RCA: 78% - B<br>TWA: C (10%) |
| ***Question 9***<br>Which one of the following consists of only materials that are ALL non-magnetic?<br>A. aluminium foil, piece of paper<br>B. iron nails, plastic bottle<br>C. piece of glass, sewing needle<br>D. steel wool, water | 9 RCA: 22% - A<br>TWA: D (39%) |
| ***Question 10***<br>Which statement on the single fixed pulley is NOT correct?<br>A. it is made up of only one pulley which is fixed<br>B. it reduces the effort needed and it changes the direction of the force<br>C. effort distance is equal to the load distance<br>D. it enables us to raise a load much higher than the person doing it<br>  | 10 RCA: 23% - B<br>TWA: C (35%) |
| ***Question 11***<br>Below is the diagram of incident ray, refracted ray and reflected ray at the boundary of air and water. Which statement is correct?<br>A. angle of incident is equal to angle of refraction<br>B. angle of incident is bigger than angle of refraction<br>C. angle of incident is smaller than angle of refraction<br>D. angle of reflection is equal to angle of refraction<br>  | 11 RCA: 50% - B<br>TWA: A (34%) |
| ***Question 12***<br>What do you call the process of the change of the states from gas to liquid?<br>A. evaporation<br>B. melting<br>C. condensation<br>D. sublimation<br>  | 12 RCA: 69%- C<br>TWA: D (15%) |
| ***Question 13***<br>Which statement on the inclined plane is NOT correct?<br>A. it is also known as a slope<br>  | 13 RCA: 11% - D<br>TWA: C (31%)<br>Poor performance when identifying one incorrect answer. |
| ***Question 1 (S4)***<br>Which of the following can provide the human body with long-term immunity against some diseases?<br>A. antibiotics<br>B. vitamins<br>C. vaccines<br>D. red blood cells | 14 (C1) RCA: 41% - C<br>TWA: B (22%)<br>Note: TIMSS 2011(G8) Avr. 45% |

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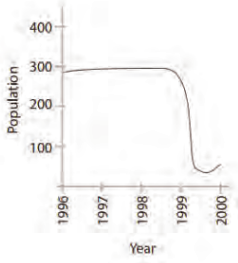
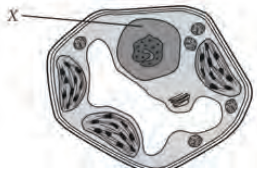
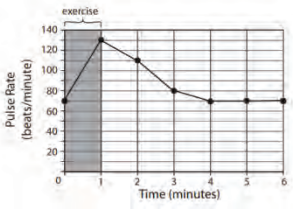
| ***Question 2 (S4)***<br>The graph indicates the number of antelopes in a certain area over a period of time. Which of the following factors is most likely to have caused the sudden change in population between 1999 and 2000?<br>A. global warming<br>B. absence of predators<br>C. depletion of the ozone layer<br>D. brush fires that destroyed the food supply<br>  | 15 (C2) RCA: 32% - D<br>TWA: A (34%)<br>Note: TIMSS 2011(G8) Avr. 48% |
| ***Question 3 (S4)***<br>Bacteria that enter the body are destroyed by which type of cells?<br>A. white blood cells<br>B. red blood cells<br>C. kidney cells<br>D. lung cells | 16 (C3) RCA: 71% - A<br>TWA: B (18%)<br>Note: TIMSS 2011(G8) Avr. 61% |
| ***Question 4 (S4)***<br>Kidneys are organs found in the human body. When he was young, a man had one of his two kidneys removed because it was diseased. He now has a son. How many kidneys did his son have at birth?<br>A. 0<br>B. 1<br>C. 2<br>D. 3 | 17 (C4) RCA: 83% - C<br>TWA: B (8%)<br>Note: TIMSS 2011(G8) Avr. 53% |
| ***Question 5***<br>The diagram shows a plant cell. What is the function of the part of the cell labeled X?<br>A. It stores water.<br>B. It makes food.<br>C. It absorbs energy.<br>D. It controls activities.<br>  | 18 (C5) RCA: 67% - D<br>TWA: A (11%)<br>Note: TIMSS 2011(G8) Avr. 36% |
| ***Question 6***<br>Which equation summarizes the process of respiration?<br>A. water + carbon dioxide + energy → sugar + oxygen<br>B. oxygen + sugar → carbon dioxide + water + energy<br>C. carbon dioxide + oxygen + water → sugar + energy<br>D. sugar + carbon dioxide + energy → oxygen + water | 19 (C6) RCA: 50% - B<br>TWA: C (21%)<br>Note: TIMSS 2011(G8) Avr. 38% |
| ***Question 7***<br>John measures his pulse rate before he exercises. It is 70 beats per minute. He exercises for one minute and measures his pulse rate again. He then measures it every minute for several minutes. He draws a graph to show his results.<br>What can be concluded from his results?<br>A. His pulse rate increased by 50 beats per minute.<br>B. His pulse rate took less time to slow down than to increase.<br>C. His pulse rate after 4 minutes was 80 beats per minute.<br>D. His pulse rate returned to normal in less than 6 minutes.<br>  | 20 (C7) RCA: 44% - D<br>TWA: B (22%)<br>Note: TIMSS 2011(G8) Avr. 57% |

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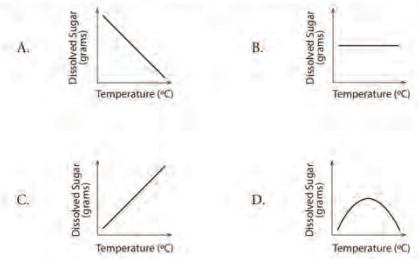
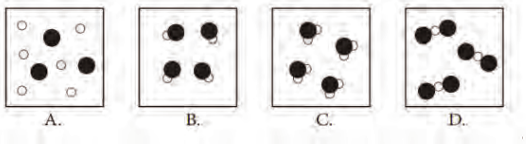
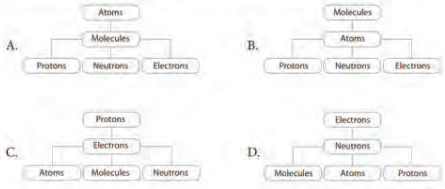
| ***Question 8***<br>Twins are born. One is a boy and one is a girl. Which statement is correct about their genetic makeup?<br>A. The boy and the girl inherit genetic material from the father only.<br>B. The boy and girl inherit genetic material from the mother only.<br>C. The boy and girl inherit genetic material from both parents.<br>D. The boy inherits genetic material from the father only and the girl inherits it from the mother only | 21 (C8) RCA: 89% - C<br>TWA: N/A (6%)<br>Note: TIMSS 2011(G8) Avr. 83% |
| ***Question 9***<br>Bob did an experiment to investigate the effect of temperature on the solubility of sugar in water by measuring the amount of sugar that would dissolve in 1 liter of water at different temperatures. He then plotted his results. Which of the following is likely to be the graph showing Bob's results?<br>  | 22 (C9) RCA: 48% - C<br>TWA: D (22%)<br>Note: TIMSS 2011(G8) Avr. 45% |
| ***Question 10***<br>In the diagrams below, hydrogen atoms are represented by white circles, and oxygen atoms are represented by black circles. Which of the diagrams best represents water?<br>  | 23 (C10) RCA: 59% - C<br>TWA: D (17%)<br>Note: TIMSS 2011(G8) Avr. 46% |
| ***Question 11***<br>Which of these diagrams best represents the structure of matter, starting with the more complex particles at the top and ending with the more fundamental particles at the bottom?<br>  | 24 (C11) RCA: 57% - B<br>TWA: A (25%)<br>Note: TIMSS 2011(G8) Avr. 41% |
| ***Question 12***<br>Some physical properties of five different substances (A, B, C, D, and E) are outlined in the table below.<br><br>Which substances are metal?<br>A. Substance A, B and C<br>B. Substance A and B<br>C. Substance C and D<br>D. Substance A and C | 25 (C12) RCA: 51% - D<br>TWA: B (25%)<br>Note: TIMSS 2011(G8) Avr. 44% |

| | Substance A | Substance B | Substance C | Substance D | Substance E |
|---|---|---|---|---|---|
| Physical state at room temperature (20°C) | Solid | Solid | Liquid | Liquid | Gas |
| Appearance/ colour | Shiny grey | White | Silver | Colourless | Colourless |
| Conducts electricity | Yes | No | Yes | Yes | No |

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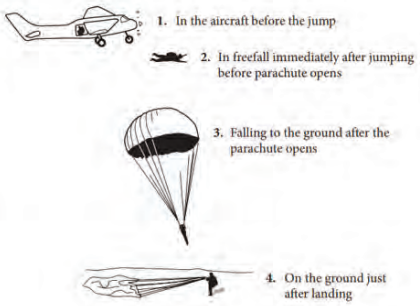
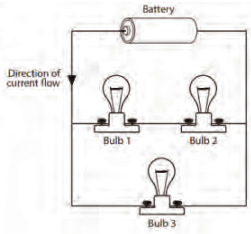
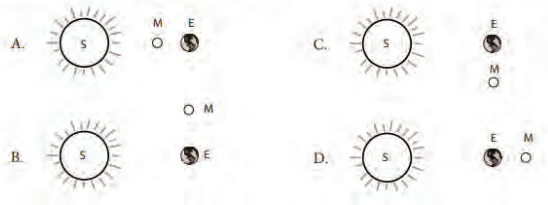
| ***Question 13***<br>Which of the following energy conversions takes place in a battery-operated flashlight?<br>A. electrical → mechanical → light<br>B. chemical → mechanical → light<br>C. chemical → electrical → light<br>D. nuclear → electrical → light | 26 (C13) RCA: 52% - C<br>TWA: A (16%)<br>Note: TIMSS 2011(G8) Avr. 35% |
| ***Question 14***<br>The figure shows a parachute jumper in four positions.<br>In which of the positions does the force of gravity act on the jumper?<br>A. Position 2 only.<br>B. Positions 2 and 3 only.<br>C. Positions 1, 2 and 3 only.<br>D. Positions 1, 2, 3, and 4.<br>  <br>1. In the aircraft before the jump<br>2. In freefall immediately after jumping before parachute opens<br>3. Falling to the ground after the parachute opens<br>4. On the ground just after landing | 27 (C14) RCA: 30% - D<br>TWA: B (24%)<br>Note: TIMSS 2011(G8) Avr. 32% |
| ***Question 15***<br>Three identical light bulbs are connected to a battery as shown in the diagram. The arrow indicates the direction of the current flow.<br>Which statement is true?<br>A. The current in Bulb 1 is greater than the current in Bulb 2.<br>B. The current in Bulb 1 is greater than the current in Bulb 3.<br>C. The current in Bulb 2 is the same as the current in Bulb 3.<br>D. The current in Bulb 2 is the same as the current in Bulb 1.<br>  <br> | 28 (C15) RCA: 58% - D<br>TWA: A (14%)<br>Note: TIMSS 2011(G8) Avr. 43% |
| ***Question 16***<br>A man climbed to the top of a very high mountain. While on the mountain top, he drank all the water in his plastic water bottle and then put the cover back on. When he returned to camp in the valley, he discovered that the empty bottle had collapsed. Which of the following best explains why this happened?<br>A. The temperature is lower in the valley than on the mountain top.<br>B. The temperature is higher in the valley than on the mountain top.<br>C. Air pressure in the valley is lower than on the mountain top.<br>D. Air pressure in the valley is higher than on the mountain top. | 29 (C16) RCA: 21% - D<br>TWA: B (23%)<br>Note: TIMSS 2011(G8) Avr. 33% |
| ***Question 17***<br>A student sets up an investigation to test the strength of magnets. He has several magnets of different sizes, shapes, and masses. He uses the magnets to lift metal paper clips. How is the strength of a magnet defined in the investigation?<br>A. by the mass of the magnet lifting the metal paper clips<br>B. by the size of the magnet lifting the metal paper clips<br>C. by the number of metal paper clips lifted by the magnet<br>D. by the time the metal paper clips stay on the magnet | 30 (C17) RCA: 26% - C<br>TWA: B (20%)<br>Note: TIMSS 2011(G8) Avr. 42% |
| ***Question 18***<br>Which of the following is the major cause of tides?<br>A. heating of the oceans by the Sun<br>B. gravitational pull of the Moon<br>C. earthquakes on the ocean floor<br>D. changes in wind direction | 31 (C18) RCA: 13% - B<br>TWA: D (30%)<br>Note: TIMSS 2011(G8) Avr. 43% |

| | |
|---|---|
| ***Question 19***<br>Which diagram shows the position of the Sun (S), moon (M), and Earth (E) during an eclipse of the moon? (Not drawn to scale)<br>  <br> | 32 (C19) RCA: 34% - D<br>TWA: A (39%)<br>Note: TIMSS 2011(G8) Avr. 35% |
| ***Question 20***<br>Which statement is NOT correct on how you can you make use of computer at school or at home?<br>A. Writing documents<br>B. Drawing pictures<br>C. Cooking breakfast<br>D. Searching information | 33 (C20) RCA: 73% - C<br>TWA: D (13%) |
| ***Question 21***<br>How often have you used laptop computers at your school or at home.<br>A. Almost everyday<br>B. Once in a week<br>C. Once in a month<br>D. Never used | 34 (C21) : 92% - ABCD<br>A (36%), B (52%), C (2%), D (1%), N/A 8%<br>This question is intended to know how often the students use computers and students got a mark as long as they answered.<br>Positivo-Laptop PC (Windows) has been distributed in the three schools. |
| ***Question 22***<br>Calculate the volume of a body with 0.8 g/cm$^3$ and 240g.<br>A. 192 cm$^3$<br>B. 239.2 cm$^3$<br>C. 240.8 cm$^3$<br>D. 300 cm$^3$ | 35 (C22) RCA: 65% - D<br>This is a question of primary mathematics level<br>TWA: A (13%) |

# Appendix 7. User Guide for CBC Training Phase III

REPUBLIC OF RWANDA

MINISTRY OF EDUCATION

Rwanda Education Board

# User Guide for CBC Training Phase III

## Reflections on Teaching Practice
## and
## Focus on Assessment

February 2018

REPUBLIC OF RWANDA

MINISTRY OF EDUCATION

Rwanda Education Board

# User Guide for CBC Training Phase III

## Reflections on Teaching Practice
## and
## Focus on Assessment

February 2018

## FOREWORD

On behalf of the Ministry of Education and Rwanda Education Board, I am greatly honoured and privileged to witness release of the Teacher Training Manual that will support reflection on teaching practice and focus on assessment of the Competence-Based Curriculum.

To date, we have developed two training manuals in the first two phases: "Roll out of the Competence-Based Curriculum" and "The Implementation of the Competence-Based Curriculum in Schools". We shall continue to support the teaching and learning process of the Competence Based Curriculum in all schools. We acknowledge that proper implementation of the Competence Based Curriculum demands a variety of interventions, and training of teachers will be one of them. Rwanda Education Board working with its Development Partners and other organizations pledge support to this endeavour to the end.

This Manual is intended for facilitators of the Phase III training of Competence Based Curriculum, and supplements an audio-visual training material which was developed together. It provides rich information on current classroom practice which attributes to teachers' and school administrators' effort, and reflects on learner-centred teaching methods and approaches. It also provides practical guidelines for implementation of assessment. Teachers and school administrators are encouraged to enhancing teaching and learning through School-based In-service training and continuous professional development of teachers. Finally, this document is written at the dawn of a new era and marks a crucial milestone in the development of education in Rwanda.

I wish to sincerely extend my appreciation to the people who contributed towards the development of this document, particularly REB and its staff who organized the whole process from its inception. Special appreciation goes to the Development Partners who supported the exercise throughout. Any comment or contribution would be welcome for the improvement of this training manual.

**Dr. NDAYAMBAJE Irenée**
Director General
Rwanda Education Board

## ACKNOWLEDGEMENTS

Rwanda Education Board (REB) expresses its gratitude to all individuals, institutions and organizations that pledged their technical or financial contributions to the development of this Teacher Training Manual.

We are especially indebted to UNICEF for their financial support and to UNICEF and JICA for their technical input into the development of this manual.

We are also grateful to REB's Staff and schools and teachers who were involved in the process of material development that culminated into the production of this manual.

We also value the contribution of other education partner organizations such as IEE, Educate!, Save the Children, VSO, Wellspring Foundation, EDC/Akazi Kanoze, Peace Corps, UNESCO, British Council, COSTA, Right To Play, SOS, WDA, AEGIS TRUST, VVOB, UR-CE, REMA, Teach Rwanda, RSB, Access Finance Rwanda (AFR) and Local and International consultants.

Their respective initiative, cooperation and support were basically responsible for the successful production of this manual.

**NZITABAKUZE Claudien**
Head of Department
Teacher Education Management and Professionalization

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## GENERAL INTRODUCTION

The Ministry of Education (MINEDUC), through Rwanda Education Board (REB), has embarked on reviewing its curriculum to align it with national aspirations and to ensure that the knowledge, skills, attitudes and values acquired by Rwandans in schools meet the challenges of the 21st century.

The designed curriculum was launched in April 2015 and is competence-based, aiming to increase students' skills and learning outcomes by:

- making learning in Rwanda more centered around mastering of key competences,
- making learning more learner centered,
- ensuring that there is greater harmony between curriculum, assessment, teaching and learning processes, quality assurance processes and teaching learning materials; and
- equipping learners with the knowledge, skills, attitudes and values needed for a knowledge-based economy that can propel Rwanda to compete on the global market.

Implementing the new curriculum and assessment program requires large-scale efforts to rapidly prepare the education system to deliver the new approach and to reform many of MINEDUC's policies, systems and processes. To bring all these pieces together, REB developed an initial plan that identified nine broad areas of work:

1. Curriculum implementation management system.
2. Communication of the curriculum.
3. Orientation on the curriculum for all education stakeholders.
4. Developing teacher capacity.
5. Teaching and learning materials and resources.
6. National Assessment Framework.
7. Examinations.
8. Development of pre-primary and lower primary assessments of literacy and numeracy.
9. Quality assurance and use of results.

**GLOSSARY**

| | |
|---|---|
| **CBC** | Competence Based Curriculum |
| **CPD** | Continuous Professional Development |
| **DCC** | District Continuous Professional Development Committee |
| **DDE** | District Director of Education |
| **DEO** | District Education Officer |
| **DOS** | Director Of Studies |
| **HT** | Head Teacher |
| **MINEDUC** | Ministry of Education |
| **NT** | National Trainer |
| **REB** | Rwanda Education Board |
| **SBI** | School Based In-service training |
| **SBM** | School Based Mentor |
| **SBT** | Sector Based Trainer |
| **SCC** | Sector Continuous Professional Development Committee |
| **SEO** | Sector Education Officer |
| **SSL** | School Subject Leader |
| **TMIS** | Teacher Management Information System |

## TRAINING OVERVIEW

CBC induction training consists of 3 phases. The three phases of CBC training have different focuses. The First phase which was implemented in the course of 2015 aimed at introducing the conceptual understanding of CBC and SBI, as a platform to increase the proficiency of CBC at the school level. The second phase was conducted from 2016 up to July 2017 and focused on enhancing practical understanding of CBC to deepen teachers' competency on planning and delivering lessons. The third and last phase of CBC training is focusing on review of the inputs of previous two phases and observation of the current classroom situation through video materials, and assessment to prepare teachers for the first competence-based national examination in October-November 2018.

Teachers are the most important actors in implementing the new curriculum. Therefore, it is essential that teachers are well prepared and supported throughout implementation of the new curriculum. The goals and objectives of the training program are shown below.

| | | |
|---|---|---|
| **Super Goal** | : | Students are equipped with necessary knowledge, skills, competences, attitudes and values by learning from new curriculum. |
| **Overall Goal** | : | Teachers are able to facilitate students' learning using the new curriculum. |
| **Project Purpose** | : | All teachers are trained to teach according to the new curriculum. |
| **Target Group** | : | Teachers in pre-primary, primary and secondary schools (public, government-aided, private) |
| **Target Area** | : | Nationwide |
| **Implementation Agency** | : | REB<br>In cooperation with development partners which provide technical and financial assistance |
| **Output 1** | : | Organizational structure for dissemination and monitoring of new curriculum is established. |
| **Output 2** | : | Management Training is conducted to ensure capacity development for initial and continuing training, at national, district, sector and school level. |
| **Output 3** | : | Technical training is conducted at national, district, sector and school level. |
| **Output 4** | : | Monitoring and Evaluation are conducted to ensure consistent and effective delivery of training and address concerns in implementation process. |

## FRAMEWORK OF THE PHASE III TRAINING

### a. Training Structure

CBC training has two streams; administrative stream and technical stream. The administrative stream provides an organizational leadership training for DEOs, SEOs and HT/DOSs and it aims at introducing the concept of the new curriculum and the monitoring mechanism to all education stakeholders. On the other hand, the technical stream aims at providing technical contents to all teachers.

In order to equip all in-service teachers, the technical stream applies a combination of cascade training and Continuous Professional Development (CPD) as shown in the diagram below. REB develops training contents and train National Trainers (NTs). NTs train Sector-Based Trainers (SBTs), who will train teachers in a series of Sector-based CPD sessions. Sector/School-based CPD will serve as a platform to continuously explore the best approaches to the learners in the sector. This continuous cycle of professional development at the last phase of CBC training is expected to contribute to improving teachers' mastery in CBC and self-sustaining development of teachers and schools.

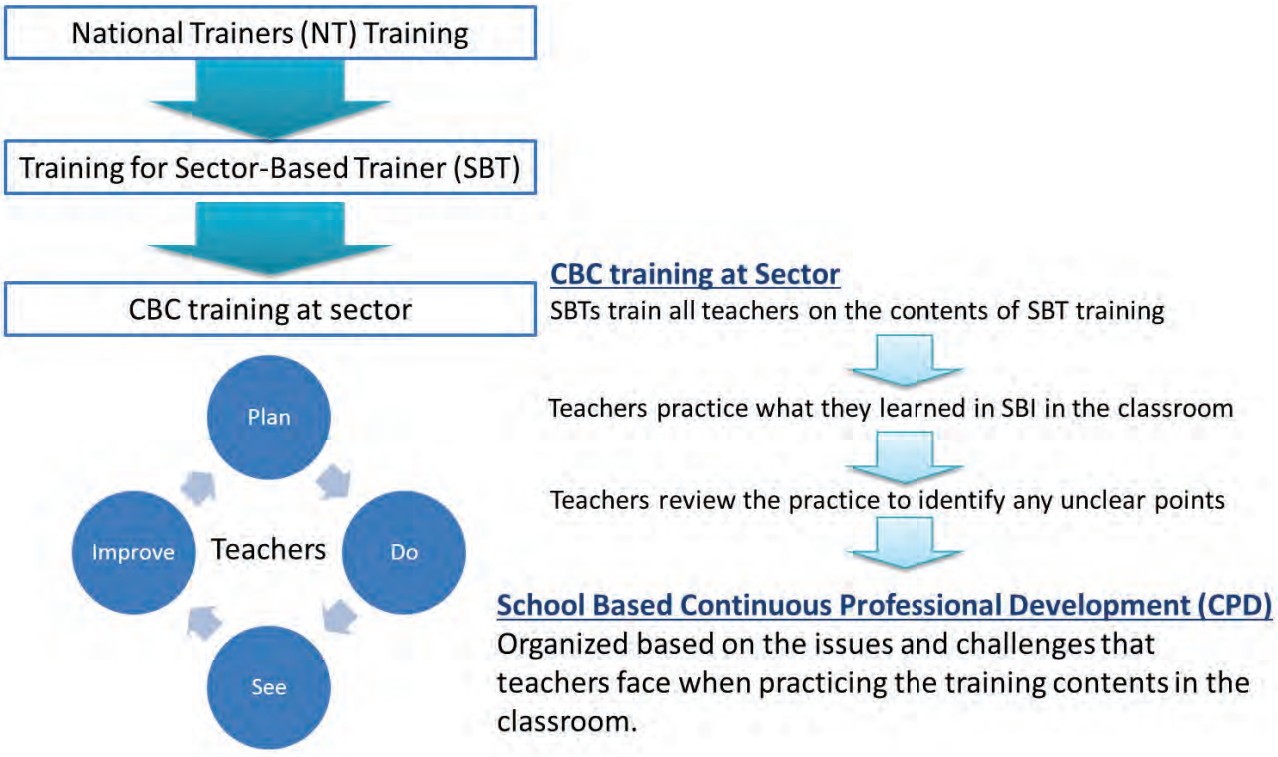



Figure 1 Cascade structure of the Technical Stream for Phase III CBC Training

**b. Timeframe**

The training for NTs was conducted in November 2017. The training for SBTs was conducted for 8 days in January 2018, before the beginning of the new academic year. The training for DDEs/DEOs/SEOs are to be conducted in March. Then the training for all teachers are expected to happen afterwards.

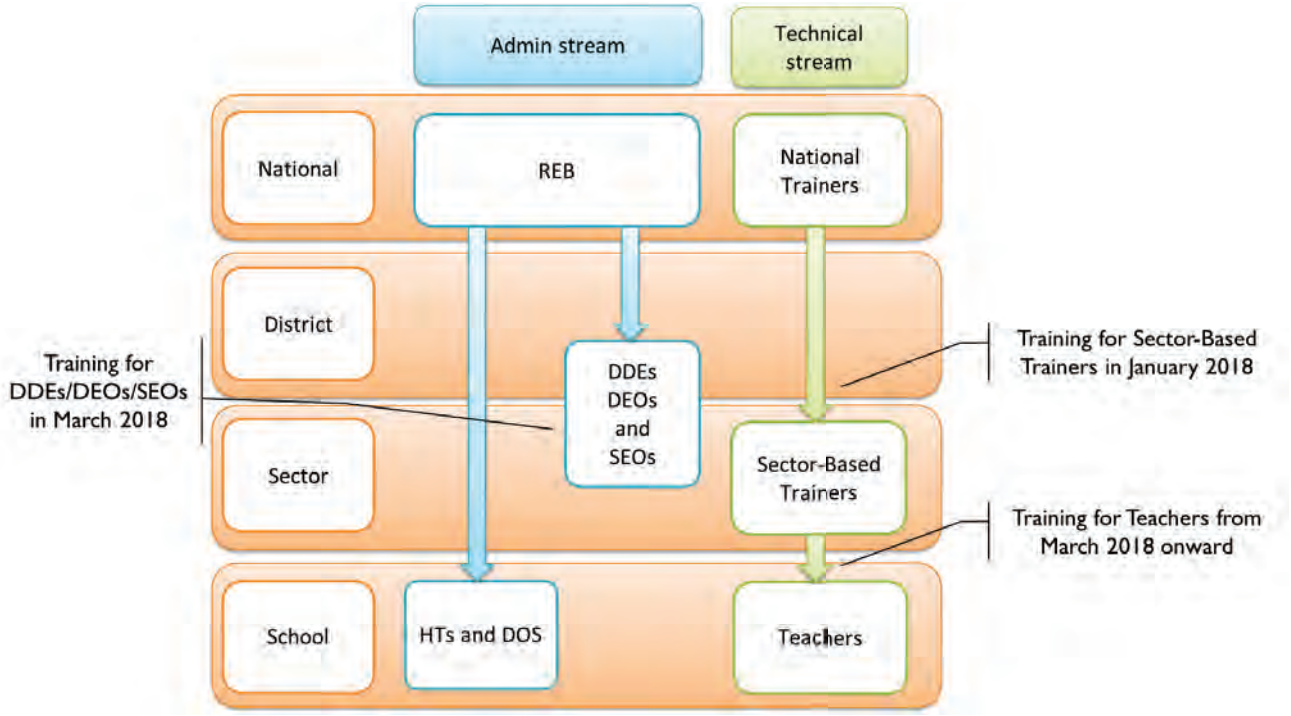



Figure 2 Cascade structure and Timeframe

The training contents are shown with approximate time of audio and tasks for each session in the table below. Extra discussion/explanation time that the trainer may add is not included. Trainers are expected to plan sessions accordingly.

Table 1 Training Contents

| Contents | | Duration |
|---|---|---|
| INTRODUCTORY VIDEO | Introduction to Lesson Study | 20 mins |
| AUDIO-VISUAL MATERIAL (review of the inputs of previous two phases and observation of the current classroom situation) | Opening Session | 2 mins |
| | Session 0: 3 Pillars of CBC (Intended CBC, Implemented CBC, and Attained CBC) | 50 mins |
| | Session 1: Success and Challenges in CBC implementation at Schools Part 1 | 55 mins |
| | Session 2: Success and Challenges in CBC implementation at Schools Part 2 | 45 mins |
| | Session 3: Intended CBC Lesson (Lesson observation by Think, Write, Pair & Share approach) | 55 mins |
| | Session 4: Lesson Planning - Preparation | 50 mins |
| | Session 5: Lesson Planning/Observation – Development (Group Work, Conducive Environment) | 40 mins |

| Contents | | Duration |
|---|---|---|
| | Session 6: Lesson Planning/Observation – Conclusion & Integration of CCI & Generic Competencies | 30 mins |
| | Session 7: Simple Formative Assessment 1 | 105 mins |
| | Session 8: Simple Formative Assessment 2 | 50 mins |
| | Session 9: Complex Formative Assessment | 105 mins |
| | Session 10: Assessment Tasks | 30 mins |
| | Session 11: Integration of ICT in Teaching and Learning | 45 mins |
| | Session 12: Changes to harness the power of ICT to improve learning | 90 mins |
| WORKSHOP | Assessment Task and Question Development | 4 days |
| AUDIO-VISUAL MATERIAL | Special Session: Overview on Teacher Management Information System | 30 mins |

**c. Materials**

Trainers need to make sure that necessary materials are ready when the training starts so that participants can make the most of the training. Examples of materials are shown below, if not all.

- Audio-visual DVD (training material data)
- Computer which Adobe Acrobat and Adobe flash player were installed in (you may download them for free)
- Projector
- Flip charts (Manila paper)
- Markers
- Notebooks (participants can bring their own)
- Pens (participants can bring their own)
- Handouts for some sessions (see respective session in 1.5 for more information)
- Syllabi and textbooks of the subjects that participants teach for assessment task and question development

### d. Roles and Responsibilities in Technical Stream

Table below shows the demarcation of the stakeholders in the technical stream. REB is responsible in developing contents and training SBTs while Districts and Sectors make sure that all teachers are trained at the sector level and supervise their continuous improvement cycle based on different situation and environment in their locality.

Table 2 Overall Demarcation in the Phase III CBC Training

| | |
|---|---|
| REB | ✓ Develop a training system which is able to disseminate contents to all teachers<br>✓ Develop training materials<br>✓ Train NTs who train SBTs<br>✓ Develop a monitoring system that enables REB/District/Sectors to provide solutions to address challenges for the teachers |
| District (DCC/DDE/DEO) | ✓ Make sure that in-service teachers in the district are trained through CBC training at sector<br>✓ Monitor and evaluate CBC training at sectors conducted in the district and take actions accordingly. |
| Sector (SCC/SEO) | ✓ Make sure that teachers in the sector are trained through the Sector-based CPD<br>✓ Monitor and evaluate Sector-based CPD and take actions accordingly |
| Development Partners | ✓ Support CBC training in a technical, managerial and financial manner<br>✓ Provide materials and expertise to NTs / SBTs |

The table below describes the organizers, facilitators and participants of trainings at each level. Training for NTs was organized and facilitated by REB. Training for SBTs was organized by REB too, and facilitated by NTs. CBC trainings at sector level will be organized by SEOs, facilitated by SBTs, with support from other resource persons such as Mentor Trainers (MTs) and participated by all teachers in the sector. SBI will be organized by HT/DOS and SBI Group Leader, facilitated by SSLs and SBMs and participated by teachers in the SBI Group.

Table 3 Organizers, Facilitators and Participants of Trainings

| | Organizers | Facilitators | Participants |
|---|---|---|---|
| NT training | REB | REB | NT |
| SBT training | REB | NT | SBT |
| CBC training at sector level | SEO | SBT | All teachers in the sector |
| School-Based CPD | HT/DOS/CPD Group Leader | SBM/SSL | Teachers |

Specific and comprehensive roles and responsibilities associated with phase III of CBC training are described in the following table. SBTs will play a central role in assuring the quality of CBC trainings at sector level. SEOs are expected to manage the CBC training at sector level. SSLs who were appointed in the phase I of CBC training will be a resource persons or facilitators in the CBC training at sector level and SBI to provide subject specific expertise. DCC through DDE/DEO oversees the situation of implementation of CBC trainings at sector level in the district based on the reports from SEOs. In regard to the DCC, please also refer to the communication by REB to the all mayors on the Establishment and Rollout of District CPD Committees dated 29/07/2016 (ref: 1793/REB/TDM/2016).

Table 4 Roles and Responsibilities of Stakeholders

| Stakeholder | Roles and responsibilities |
|---|---|
| Teachers | ✓ Make sure that they are part of the Sector CPD Group that they are supposed to join<br>✓ Check the schedule of CBC training at sector level and report any difficulties in attending them if any<br>✓ Actively take part in CBC training at sector level<br>✓ Report their attendance to HT/DOS<br>✓ Share challenges and good practices with HT/DOS and SBTs |
| HT/DOS | ✓ Make sure that teachers in their school are involved in the CBC trainings at sector level<br>✓ Coordinate with SEOs and SBTs in developing schedule of CBC trainings at sector level<br>✓ Assist SEOs and SBTs in planning and implementing CBC trainings at sector level by hosting some sessions and providing refreshment / materials if fund is available<br>✓ Report teachers' attendance to SEO/SBTs<br>✓ Share challenges and good practices with SEO/SBTs |
| SBT | ✓ Be responsible in delivering the contents of the training that they attended at the training center to the teachers in the Sector CPD Group that SBTs are leading<br>✓ Follow up the CBC trainings at sector level by organizing a review meeting to act on the challenges that teachers are facing and to ensure that all teachers in the Sector-CPD Group attain the required competencies |
| SBM | ✓ Coordinate SBI and other school-based CPD activities<br>✓ Share materials that they have with other teachers if appropriate<br>✓ Follow up the CBC trainings at sector level by sharing challenges and good practices observed at the school level with SBTs |
| SEO | ✓ Make sure that teachers in the sector are trained in the CBC trainings at sector level based on thorough planning and supervision<br>✓ Recommend 10 teachers as SBTs to the district<br>✓ Compile action plans developed by each Sector CPD Group, make the Action Plan for the Sector and submit to the DCC through DDE/DEO<br>✓ Act on challenges that are reported by the SBTs, HT/DOS and teachers and then report any unsolved challenges to DCC through DDE/DEO |
| SSL | ✓ Play a role of resource person, especially in a subject area, by providing useful resources and facilitating CPD activities at sector and school level |
| DCC/DDE/DEO | ✓ Compile action plans submitted by the Sectors and develop an action plan for the district, consistent with the District Performance Contract.<br>✓ Nominate SBTs and other resource persons for the CBC trainings at sector level<br>✓ Monitor and evaluate CBC trainings at sector level conducted in the district.<br>✓ Evaluate SBTs and other resource persons for the CBC trainings at sector level.<br>✓ Report any challenges that cannot be solved at the district level to REB |

## TRAINING CONTENTS

### 1. Practical Know-How for Teachers

### 1.1. Introduction

Phase III teacher training is designed to consolidate what was learnt within phase I and II. The two previous phases were more of theory and current one focuses on classroom practice/ situations. This audio-visual material is designed to equip teachers with practices and thus it is called practical know how for teachers to facilitate them to deliver quality CBC lessons. It is made up of 12 different sessions, introductory video of lesson study and a special session about Teacher Management Information System (TMIS). It is a kind of documentary video which shows what is currently taking place in schools as far as competence based curriculum implementation is concerned. Therefore, there are narration and video clips that reflect what is to be done, and tasks to watch videos and assess for improvement.

### 1.2. How to Operate Audio-Visual Material

Before the Training

The audio-visual material will be distributed in the form of DVDs. Once facilitators get the DVD, they must be familiarized with the operation and the contents so that they can facilitate the training effectively and efficiently. The training organizers are required to ensure the following in advance;

- The training venue is well equipped.
- Necessary equipment and instruments (laptop, projector, extension, handouts, markers, flip charts etc.) are available.

On the Day of Training

(1) Preparation

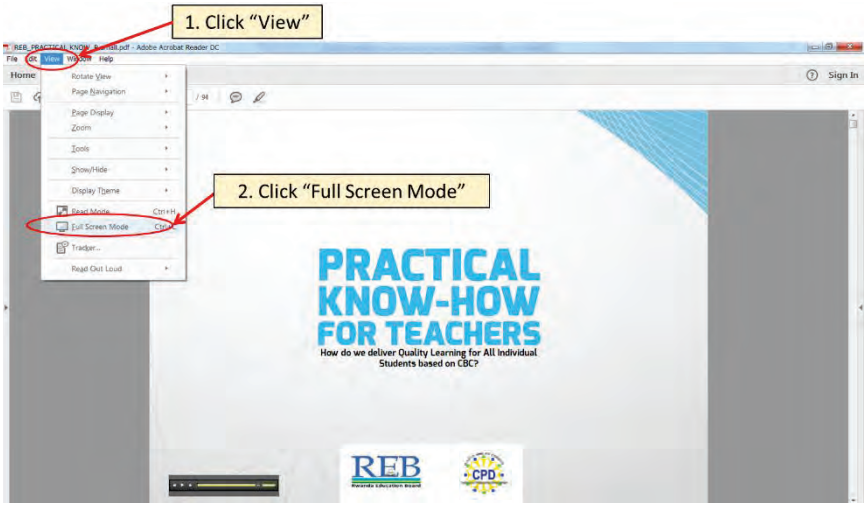
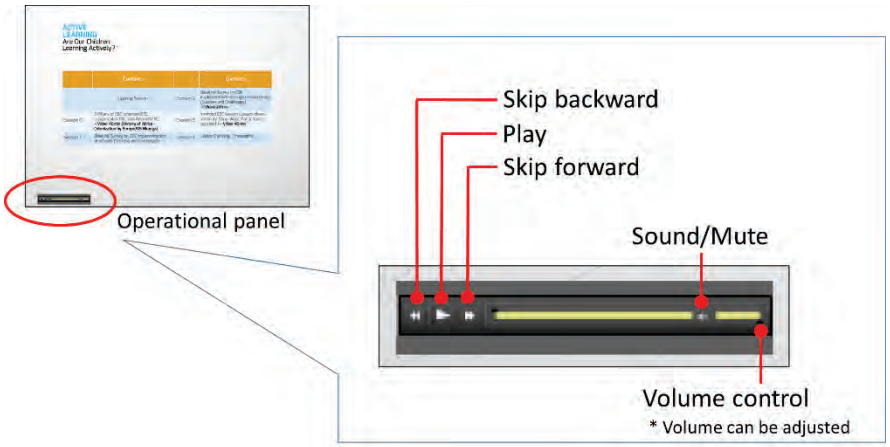
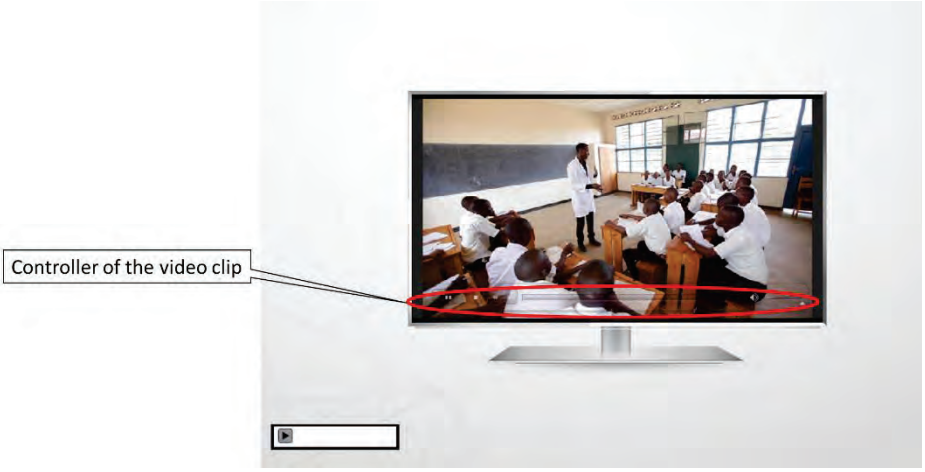
The organizers and facilitators are required to come to the venue early to prepare materials and the room by arranging tables and chairs and checking the volume of video so that everyone can watch well.

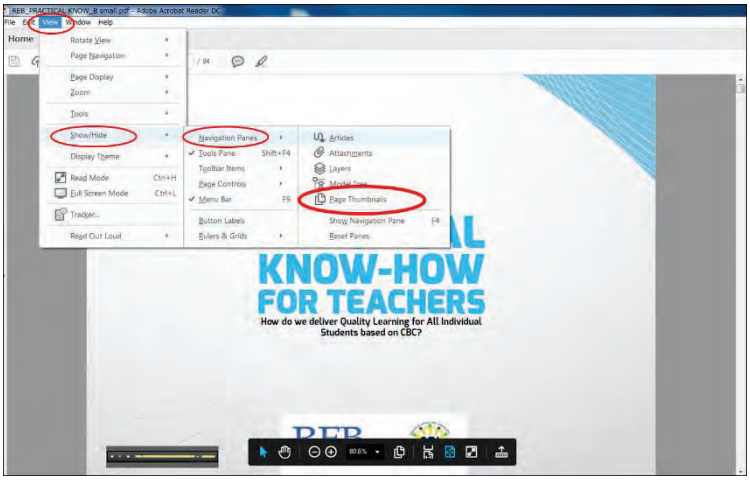
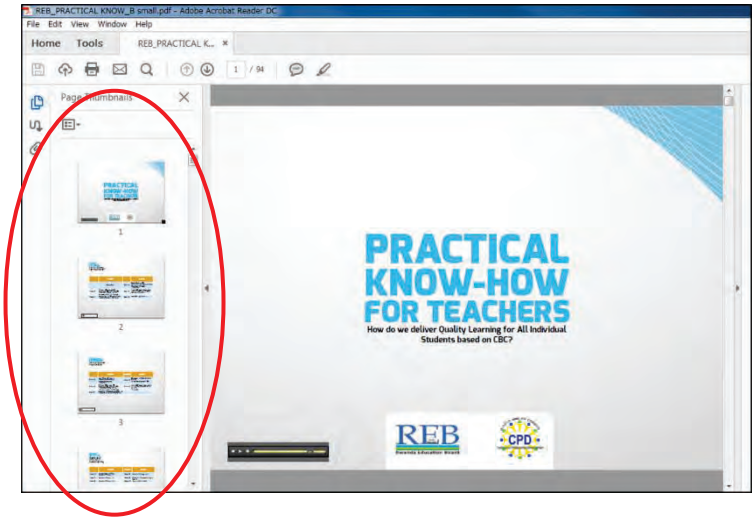
(2) General Introduction to the Participants

The organizer or facilitator should explain the following;

- This material is for reflecting on the theories that they learned in the phase I CBC training and the practices they did in the phase II CBC training.
- This material also includes findings from actual lessons.

(3) Operation of the Material

| | |
|---|---|
| How to change to full screen mode |  |
| How to control sound |  |
| How to operate video clips |  <br>Do not forget to click the allow ▶ after watching the video.<br>The narration will start and the controller will appear. |

| | |
|---|---|
| How to move some slides back or forward easily |  <br>Click View → Show/Hide → Navigation Panes → Page Thumbnails<br>  <br>Page thumbnails appear. |

(4) Facilitation and Time Management

The narrator gives a task as indicated below.

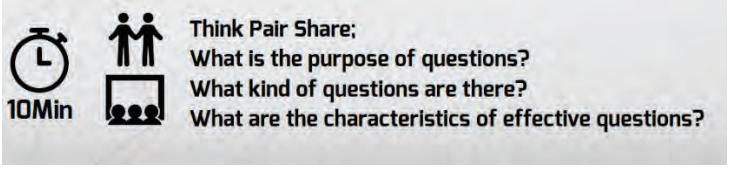



Figure 3 Task Example

Then, you pause the narration and time as required.

When time is up or the participants are ready, you start the discussion and manage time.

### 1.3. Guidelines for Facilitators

(1) What is Facilitation and Why is It Important?

Facilitation is a way of working *with* people. It is a method which creates a positive atmosphere to encourage people to share ideas, skills, resources, opinions and to think critically. Facilitation for continuous professional development (CPD) helps a group of people to work together to learn new skills from each other.

Trainers need facilitation skills in order to do deliver the Phase III CBC training. The facilitator does not teach everything directly, but uses skills to allow the group to share their ideas and to teach each other. A facilitator is not a lecturer; an effective facilitator must know when to take a leadership role, and when to be neutral and 'step back'. This is difficult to balance! A facilitator acts as a guide, not as a boss!

A facilitator focuses on how the group is working together, rather than on pushing his/her opinions onto others. He/she encourages all participants to participate actively, and helps a group to work together to gather information and share ideas. He/she helps a group reach agreements by summarising information and making sure that all participants get a chance to speak (without forcefully adding his/her own ideas).

A facilitator is not expected to know all the answers – he/she is not expected to be an expert. A facilitator is there to help the group share ideas and learn from each other. If an answer can't be found, the facilitator notes the question and helps the group decide how it will be answered later.

To be capable in the role a facilitator must plan carefully and prepare well before starting sessions.

(2) What Makes a Good Facilitator?

To be good facilitators we need a variety of techniques and skills for facilitation; we will continue to add to these skills over time. There are certain behaviours which are appropriate for facilitators, and others which are not. The table below shows some of them.

Table 5 Good Facilitator and Bad Facilitator

| A good facilitator | A bad facilitator |
|---|---|
| Speaks loudly and clearly, using respectful language. | Interrupts or challenges the person who is talking. |
| Gives clear instructions and is prepared to clarify when people don't understand. | Does things that distract participants. For example, talking loudly on the phone whilst participants are working. |
| Is confident.<br>Signs of confidence include:<br>- Being flexible<br>- Accepting to have their ideas and opinions challenged without feeling upset | Doesn't keep time. |
| Respects the ideas, opinions and values of all participants. | Allows one or two people to dominate the group. Allows some people to bully others. |
| Respects confidentiality of all participants. | Tells stories and jokes that distract participants from the focus of the activity. |
| Encourages comments, ideas and questions from participants when appropriate. | Takes sides with one section of the group. |
| Engages with participants when they are not active. | Doesn't use interactive activities and just reads from notes. |
| Listens to participants and responds to their needs. | Uses repetition/rote learning. |
| Makes sure that participants understand the objectives of the session. | Is disorganized. |

| A good facilitator | A bad facilitator |
|---|---|
| Creates an inclusive atmosphere. Doesn't humiliate participants in any way. | Spends a lot of time talking instead of allowing group members time to talk |
| Uses a variety of teaching methods to keep participants active. | Is very strict and controlling. |
| Uses humour, stories and examples that directly relate to the session and are culturally appropriate | Talks badly/spreads rumours about participants when they are not around |
| Makes learning fun. | Makes learning tiresome and annoying |

(3) Preparation and Planning

One of the most important skills that trainers will need to deliver the Phase III CPD training is the ability to break large sessions into smaller steps.

Often, we meet unexpected challenges during training sessions (things very rarely go exactly as we plan). Planning and being well-prepared helps us manage these unexpected challenges. Planning sessions well is extremely important– getting everything ready the night before if possible will help us as facilitators to feel organized, professional and confident. The following checklist allows facilitators to prepare effectively:

Table 6 Facilitators' Checklist

| | |
|---|---|
| **1. I have read the facilitators' guide very well.**<br>(*This helps us understand how the session fits with the other sessions.)* | |
| **2. I have read the whole session plan to fully understand it.**<br>(*This helps us understand what will happen in the session. We are able to think about any problems that could happen. We can have confidence when facilitating sessions. We can prepare resources.)* | |
| **3. I understand the purpose and objectives of this CPD session.**<br>(*If we don't understand, we can ask others to help us before we start training.)* | |
| **4. I have thought about the needs of the participants in my group and changed the session plan accordingly:**<br>- **I have changed times when necessary**<br>- **I have changed activities when necessary**<br>(*Doing activities that are not suited to participants will frustrate everyone. It is better to be creative and adapt the sessions for the needs of your participants.)* | |
| **5. I have thought about the potential problems that could happen during the CPD session and taken steps to avoid/solve them.**<br>*(This helps us prepare for unexpected situations that could happen during training. When we think through possible problems, we can think of possible solutions. We can't think of every single problem which may happen, but being prepared can help us feel more in control and more confident)* | |
| **6. I have prepared all materials and teaching aids I need for this session.**<br>(*Being prepared before the session means that we will not have to leave the session to find materials. This saves time. It will also make us feel more prepared, organized and confident.)* | |
| **7. I have visited the room in advance and decided how it will be arranged.**<br>(Visiting the room helps us to check that it is suitable for the training and the needs of our participants). | |
| **8. I have created an attendance register.**<br>*(This helps us monitor who is present, and what they have been learning. It is useful in reporting.)* | |
| **9. I have arrived early on the day of CPD session to arrange and organize everything in good time.**<br>(*This is an important part of time management. Being prepared before our participants arrive is good practice. It helps the CPD session start at the correct time. It can help you feel more organized, and presents a professional impression to participants. )* | |

| | |
|---|---|
| **10. I have written the learning objectives on the blackboard.**<br>(*Participants can clearly understand what the purpose of the session is. This can help them to learn better. It is also a way of modelling good practice which can be used in class).* | |
| **11. I have set ground rules with the group.**<br>(Setting ground rules ensures that our groups can work together respectfully and in harmony. When everyone knows the expected behaviour in the group, it can help us manage any difficult situations which may happen). | |
| **12. After the CPD session, I think about what went well and what I can do better next time.**<br>(*It is important to continuously reflect on our practice as mentors and make sure that we improve our facilitation skills).* | |

(4) Introduction to Facilitation skills

**Establishing a positive and collaborative working environment**

It is important to create a positive collaborative atmosphere from the first session. We are going to be learning from each other as a group, so it is important that everyone can work together peacefully and respectfully. Methods for encouraging positive collaboration include: making everyone in the group feel welcome, agreeing on clear ground rules to help sessions run smoothly, setting clear expectations so everyone will know what will be included in the session and what will not. At the start of a session, we should explain any administrative arrangements, such as how long training will last, what participants will be learning, signing of attendance registers, etc. After this, it is always important to establish rules for the group.

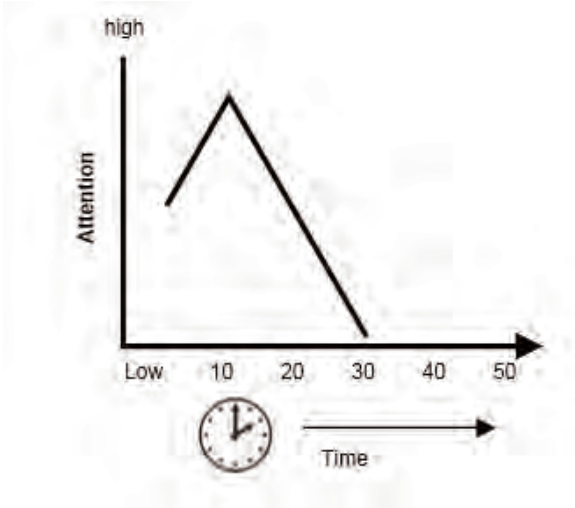
**Agree session rules:**

Ask members to think of rules which will help them work together and create a supportive atmosphere in the group. Write these rules on a chart and display it each time you do a training session together.

**Suggestions**:

- *Listen to the person who is talking (no extra conversations).*
- *Switch phones to silent.*
- *Respect time.*
- *Respect other peoples' opinions (even if they are different to yours).*
- *Speak clearly so the group can hear you well.*
- *Participate actively.*
- *Help people if they don't know something/make a mistake (don't laugh at others!).*
- *Learn from each other and work together.*
- *Enjoy and have fun!*

**Making sessions interesting**




One of the most important things about being a facilitator is that we do not lecture a group – we allow the group to share ideas. We need to think carefully about the parts of the session we will be talking for, and plan what we are going to say so that we can say it in a short and clear way. As we can see in the chart of attention graph, about 10-15 minutes listening is the maximum amount of time that people can listen carefully for – after that their thoughts will drift to other things.

Even if we talk for a long time, participants are not fully listening– so we are wasting their time, and our voices! We must use more interactive methods.

**Eliciting**

As facilitators, it is not our role to simply lecture participants to give them information. Facilitators must pull out information from the group. This is known as eliciting; it is a way of using the prior knowledge of the group. You can ask questions to find out what participants know already, before sharing new information. Very often, someone in the group will know something about what you are going to learn together. So, it is always good to find that knowledge. You can also see if participants have misunderstandings which you can correct during the session.

*But what happens when we ask a question and no-one gives the correct answer, or participants give answers which are not related to the topic?'* Sometimes, if no one in the group knows anything about the topic, then you need to give the answers. If participants give answers which are not related to what you want to discuss in this session, you need to guide your group back to the correct ideas.

**Brainstorming**

Brainstorming is a technique that can quickly elicit ideas from a group. A brainstorm should be quick and only take around 5 minutes. It should not take up the whole session!

During a brainstorm, we ask for ideas or answers to a question. We need to encourage the participants to give as many different answers as possible in a short time. Then we write the answers on the blackboard or a chart. Because time is short, we don't waste time on explanations or corrections; the focus is to gather ideas**.** We can clarify or find more information after the brainstorm is finished. Participants should also listen carefully to the group and avoid repeating what has already been said by others.

(5) Introduction to Organizing Group Work

Do you ever use group work in your teaching, or do you avoid it because it can be too noisy, too disorganized, takes too much time etc.?

Did you know that group work can be organized to avoid some of those problems? Group work is often used for facilitation so it is important to know some techniques to manage groups well.

**Stop Signals**

A stop signal can be used to get the group's attention after participants have been working independently in groups. It can also be used for getting attention when participants are being noisy. It can save your voice so you don't need to shout, 'Stop! Be quiet!'. Stop signals help a facilitator to manage the time that the group spends on different activities.

**How to teach a stop signal to your group:**

1. Clap your hands 4 times. When you have finished, ask participants to copy you (clap 4 times), then remain quiet.
2. Some participants will make mistakes and clap at the wrong time, or continue talking at the end of the signal. Practice until everyone does it correctly and participants stop at the correct time.
3. Note: You should always teach a stop signal to a group **before** you start doing something that needs stopping! (This is so that all participants understand the signal).

There are several kinds of stop signal. You can try any of these:

***Things you can say:***

- *counting down "5, 4, 3, 2, 1"*
- *Teacher: "1, 2, 3. Eyes on me." Learners: "1, 2. Eyes on you!"*
- *Teacher: "Are you ready?" Learners: "Yes I am!"*

***Things you can do:***

- *Clap a rhythm which the class must complete.*
- *Create a shaker (i.e. Small stones in a bottle and move around the room shaking it). Put a hand in the air – when the learners see it, they need to stand up silently.*

Whatever stop signals you decide to use, the important thing is to practice so everyone knows to stop at the same time**.**

**Common Problems with Group Work and Their Solutions**

The list below shows common problems that often arise when organizing group work:

a) Groups take a lot of time to get started and waste session time.
b) Some people don't participate well in groups.
c) Groups take a long time to stop working.
d) Getting feedback from groups takes a long time.

But there are specific techniques that we can use to manage these problems.

**a) Groups take a lot of time to get started and waste session time.**

- **Give a time limit:** when you ask participants to form groups, you can say 'can we take 1 min to make groups?' Then, if participants take a long time, you can start moving people around and telling them where to sit.
- **Give examples:** groups often take a long time to start because they don't understand the task well. Always ask for one or two examples from participants before you start a group activity.
- **Share the time allocation:** as you start, it's a good idea to tell groups how much time they have to work? You can say 'we are going to work on this for 10 minutes.'

**b) Some people don't participate well in groups.**

- **Give roles:** if you see that some people are not participating well in groups, you can walk around the room and give people roles. For example, ask someone to write/ be group leader/ be ready to summarize the main points for whole group feedback later.
- **Encourage participation:** you can encourage people to participate by saying that all ideas are welcome/important. When working with adults, it is not a good idea to be rude- even if you are frustrated that they are not participating!
- **Talk to people privately:** if someone is really not participating well or being disruptive, it is a good idea to ask the person to come and talk to you privately. You can ask him/her what the problem is, and what you can do to solve it together.
- **Helping groups:** you can walk around the room and give help to groups as needed. Usually, you should only spend around 5 minutes helping before you move on to others. This will help you move around the room and help many participants. If someone is really stuck, ask a peer to help.
- **Moving people to help others:** when you are facilitating, there will always be some people who understand more quickly than others. You can ask fast participants to help their peers.

**c) Groups take a long time to stop working.**

- **Don't wait until everyone has finished everything!** You can walk around the room to see how groups are working. When most of the groups are near the end, you can stop. Don't feel like every person in the group needs to complete every activity. You can stop groups before they complete the tasks. You can reassure participants, 'Don't worry if you haven't finished, we are going to share together with everyone now'.
- **'We have around … minutes left'** Tell groups when it is nearly time to stop. This can help them make sure they have covered the main points and can encourage them to work faster.
- **Stop signal:** when time is over, use a stop signal to get participants' attention. This will save you from shouting over people's voices if they are deep in discussion.

**d) Getting feedback from groups takes a long time**

- **Select people to summarize for their group.** The group representative can share what has been discussed.
- **You do not need to hear from every group**. Very often, groups will think of the same things! It's better to ask 3 groups to share, then ask if there are any other important comments that should be added.
- **Remind participants not to repeat what has already been said.** A lot of time can be wasted when participants repeat comments already made by others. Before they start to give feedback, encourage participants to listen to what has been said before and only share something new - that will save a lot of time.
- **List ideas/questions to come back to.** Sometimes feedback can take too long and you want to move on to the next part of the session. Tell participants that 'these are good points and we should think about them more, but we need to move on now. We can write them down to remind us to discuss them another time'.

Other common problems and their solutions:

**The task is too easy**- *finish quickly and move on to something else. / Add extra challenges to make the task more difficult.*

**The task is too difficult** – *focus on completing only one part of the task and come back to it another time. Or break the task into smaller steps and take more time. But this means you will not complete something else on your plan. You will have to decide what to cut.*

**Participants are bored/tired/ -** *use an energizer to wake people up. Move on to another more interesting activity, and plan to come back to the task another time.*

**Participants are hungry/thirsty** – *if possible allow short breaks and allow participants to get food/a drink.*

As facilitators, we should keep looking around the group and seeing who is participating. If group members are not participating, we should think about why.

(6) Managing Difficult Situations in Group Discussions

Sometimes when we are facilitating group discussions, certain difficult situations can arise but there are some things we can do to help.

| |
|---|
| ***One person is dominating the group which is discouraging others, what can you do as a facilitator?***<br>*Do not ask him/ her any more. Mention that you need people who have not spoken so far. You can say something like this: Thank you for your comments, can we hear from someone who hasn't spoken/shared their ideas yet?*<br>*Sometimes you need to interrupt a person in order to keep time. You can say something like 'I'm sorry to interrupt you, but thank you so much for your suggestions. Can someone else in the group add to these ideas?'* |
| ***A group member says something that you disagree strongly with. What should you do as a facilitator?***<br>*A facilitator's role is not to argue or debate with someone. To encourage discussion, you need to treat all viewpoints with respect, even if you don't agree with them. You can ask questions like 'does everyone agree? And 'What about…?' to present another side of the argument.* |
| ***People have been talking for too long, what can you do as a facilitator?***<br>*You can stop the group and help them move onto something else by saying something like 'thanks for your ideas, and it seems like there is more to discuss, but let's move on to…'* |
| ***Someone is being rude/disrespectful, what can you do as a facilitator?***<br>*Remind the group of the rules you set to respect each other and all opinions. Emphasise that we are all learning from each other. Focus on the continuing development of trust, commitment and co-operation within the group. Build on the support and positive feelings within the group.*<br>*Talk to a member outside the group setting in cases where a personal difficulty is causing problems in the group, or where a person has consistently ignored other methods to handle the difficulty.* |
| ***Someone has been talking for a long time about something that is not related to the session, what can you do as a facilitator?***<br>*Thank the person for their comments and move the group on. You can say something like 'Thank you for your comments. It is an interesting point, but let's go back to the main purpose of our discussion which is …. Maybe we can discuss that later, or during break.'* |
| ***People are laughing and joking, what should you do as a facilitator?***<br>*Some laughter is good, when all participants are enjoying themselves together. However, if it is directed at someone and making them feel uncomfortable, it is important to stop it. Remind participants of the rules to respect each other, and how we are all working together as a team. We are all learning new things together so we should support each other.* |
| ***The group starts discussing items which are off topic, what can you do as a facilitator?***<br>*Make a note of the topic to discuss later, or encourage participants to discuss it in their free time.* |

| |
|---|
| ***The group makes suggestions which are idealistic and not realistic, what can you do as a facilitator?***<br>*Thank the group for their ideas, but remind them of key factors, such as budget, time constraints, space, number of people etc.; ask them to think of ideas which incorporate reality.* |
| ***How do you deal with latecomers as a facilitator?***<br>*To create a welcoming atmosphere in your group, you don't want to stop and chastise someone for being late. Welcome latecomers to the group but speak to them privately about coming late to your sessions and the effect it has on the work of the group. See if there are any problems which are causing participants to come late, and work together to solve them.* |
| ***People want you to 'be the boss' and make decisions on their behalf.***<br>*Clarify the facilitator's role; ask what members can realistically expect of the facilitator and set the facilitator's limits. The facilitator must be clear in responding to requests from the group.* |
| ***Participants are shy***<br>*Encourage everyone to speak. If a participant is not active, ask them a question directly. Model being open, honest and risk-taking. The risk in being honest and direct is that a person can feel will be isolated, ridiculed or ignored. This is very real for people, and you help others to take this risk by modelling it. When members recognize these characteristics in you, they will be encouraged to behave similarly.*<br>*You can also use* 'everybody speaks' *when using group work. Ask a simple question like 'why do you like being a teacher' and everyone in the group should answer. (The longer a person doesn't speak in during group work, the less likely they are to speak at all. This method encourages everyone to speak from the start, which should encourage them to speak during the group activity).* |

(7) What is Constructive Feedback and Why should We Use It?

Feedback means giving a person information about the results of his/her actions to tells a person whether he/she is working well. A person's strengths are discussed as well as their weaknesses. Without effective feedback, you may not be able to adjust your work and reach your goals.

Think back to a time when you made a mistake. How did it feel? When we make mistakes we often feel embarrassed, feel like we are failing, could have done better, wish we had done something differently, etc. Now think about how it feels if your mistake is shared with everyone? (Maybe embarrassing, shameful, bad impact on your reputation and, in extreme cases, ability to do your work etc). Feedback is important for professional learning and growth. But the way in which we give feedback is very important; it can be given in a negative or positive way. Positive, constructive feedback can help teachers grow professionally. Negative feedback can demotivate and demoralize teachers and prevent them from improving their teaching practice.

We need to encourage teachers to give each other constructive feedback. This means giving feedback in a positive way. It encourages a teacher to think about how he/she works, guiding him/her away from bad practices and towards good ones. Constructive feedback focuses on a person's strengths and is given in an encouraging way. Weaknesses are called 'areas for improvement' to be more encouraging, and are shared in a supportive way. (Remember that the word 'construct' means to build. Constructive feedback aims to build others up). Giving feedback appropriately helps to develop another individual's skills and build his/her confidence. By providing constructive feedback, you can provide areas for improvement and set goals, without discouraging or devaluing the person. Think of a time when you received positive feedback and think of a time when you received negative feedback. Which did you prefer?

For feedback to be useful, it needs to be specific. Statements such as, 'your lesson was really wonderful' are not clear enough. The person receiving the feedback does not know what he/she did well. We need to be much more specific. We need to think about which parts are good and why. We have to choose our language carefully.

The following table shows the difference between specific and unclear feedback.

Table 7 Specific and Unclear Feedback

| ***Specific Feedback*** | ***Unclear Feedback*** |
|---|---|
| *You remembered to use the names of the learners and you asked lots of different learners to answer questions.* | *I liked your lesson.* |
| *You used a game to make the lesson fun for the learners* | *You are a good teacher.* |
| *The lesson was learner-centred because the learners were active and engaged in the lesson.* | *The lesson was good.* |
| *I liked your lesson because you used group work well to make the lesson learner-centred.* | *The lesson was bad.* |
| *Next time try to use group work to get the learners to discuss their ideas.* | *Try to teach better.* |
| *Try to learn the names of the learners.* | *You are working hard! Keep it up!* |
| *I liked the visual aid you used because it helped the learners to understand.* | *You need to improve your teaching.* |
| *You organized the classroom well so all the learners could see the blackboard clearly.* | *This lesson shows that you are implementing the CBC* |
| *You praise the learners when they do well or try hard.* | |
| *The learners used didactic materials to help them to count. This was very good.* | |
| *Next time make a visual aid to help the learners to understand.* | |

**Giving constructive feedback**

The difficult part is when we need to give negative comments, though they are very valuable to improve the teaching and learning process. We should choose our words carefully. For example, instead of saying 'weaknesses', we should say 'areas to improve'. Giving feedback is not for "criticising others", but it is for helping others to grow. Positive feedback can be a tool for creating trust between teachers as they improve their teaching practice.

**Ideas for giving constructive feedback**

a) Remember that you are peers and colleagues (you are giving **friendly advice**, not supervision).

b) Think carefully about what you are going to say before you give feedback. (You can take a short time to plan).

c) Be specific.

d) Be honest (but in a polite and respectful way!)

e) Reflect on what to do differently and how to improve.

f) Show empathy and don't be judgemental; appreciate how the person you are helping thinks, feels and behaves.

g) When there is an area for improvement, focus on the problem, not the person.

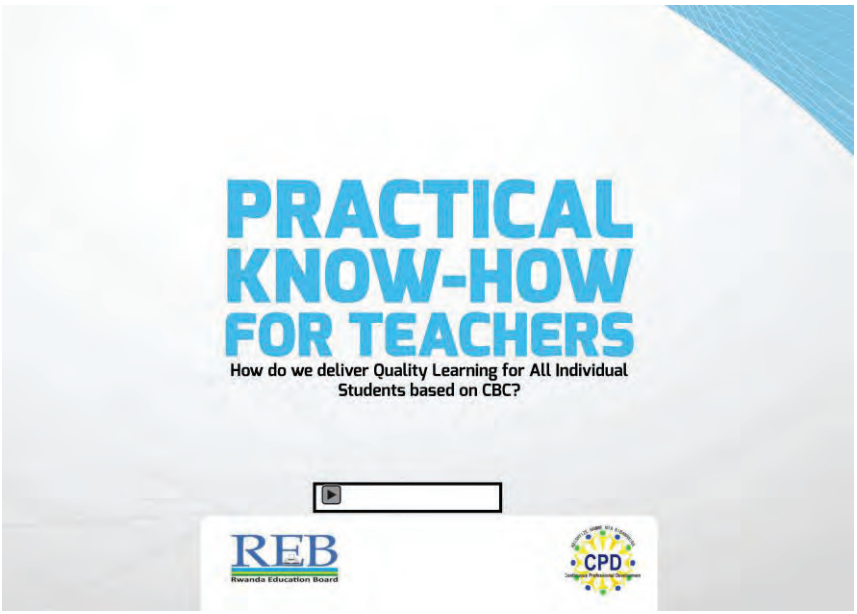
h) Don't expect to have all the answers.

### 1.4. Introductory Video of Lesson Study

This 20 minute-long video was developed from actual practices of lesson study as a form of CPD at different schools throughout Rwanda. It is intended for teachers and school leaders. It may serve well if participants watch it before session 0 as an orientation of this training. It is a catalyst to encourage them to practice lesson study rather than a material to give them pedagogical skills. Lesson study is an effective method of applying techniques of active learning and assessment to lessons.

## 1.5. Audio-Visual Material Slides

### Opening Session

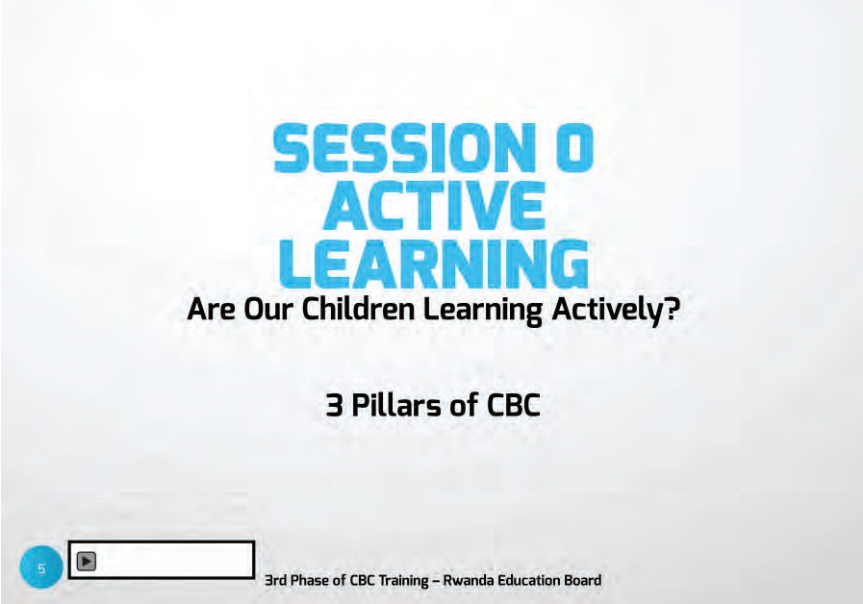



| |
|---|
| Welcome to this CBC training phase and thank you for watching this video.<br>In this training course, we are talking about Practical know-how for Teachers in Rwanda, so that more and more teachers can deliver quality learning for all students in this country, based on Competence Based Curriculum, CBC. |

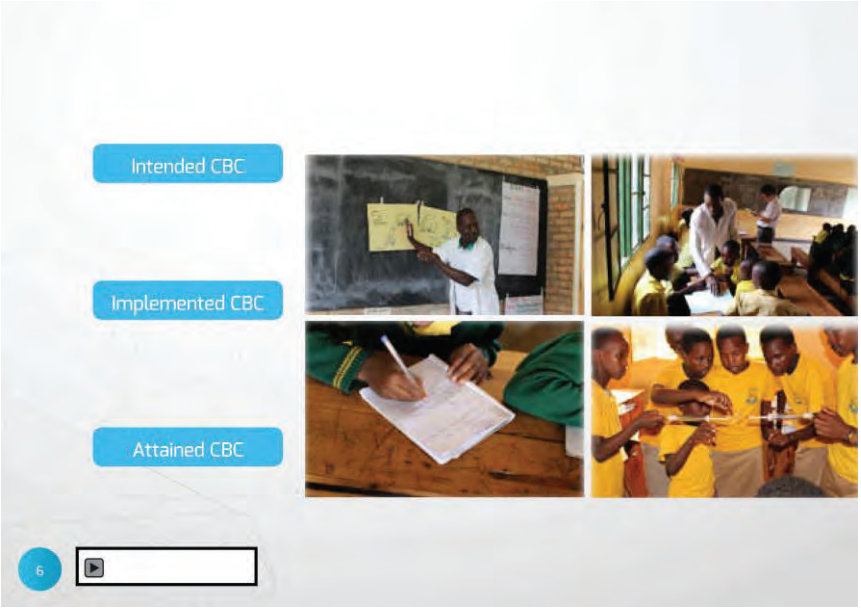
In this course, we will talk about active learning in six sessions, which will demonstrate how CBC is implemented in schools, and the successes and challenges met by teachers and learners. We will have time to watch videos of selected lesson. Your comments will help us and everyone to improve.

The next four sessions will be related to assessment. Assessment can be carried out throughout the lesson, from the introduction to the conclusion, We will see how.
From session 11 to 12, we will see how ICT can be integrated into a lesson. ICT should be used as a tool to improve teaching and learning.
In the last session, we will take a look on teachers' registration system using teacher management information system TMIS.

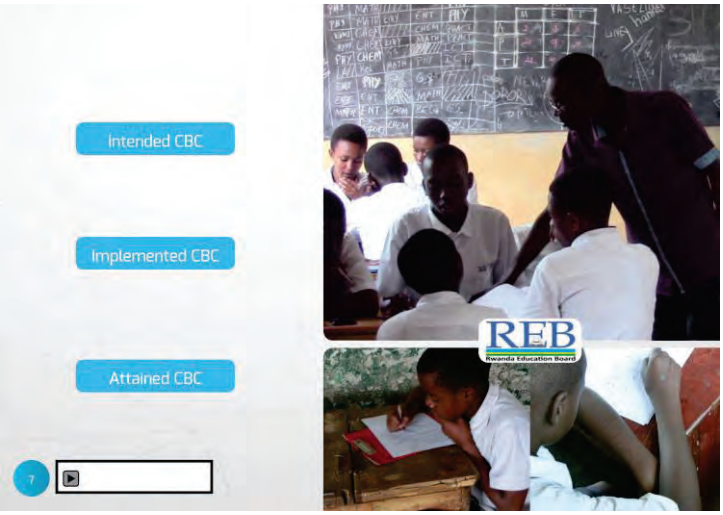
**Session 0: 3 Pillars of CBC (Intended CBC, Implemented CBC, and Attained CBC)**



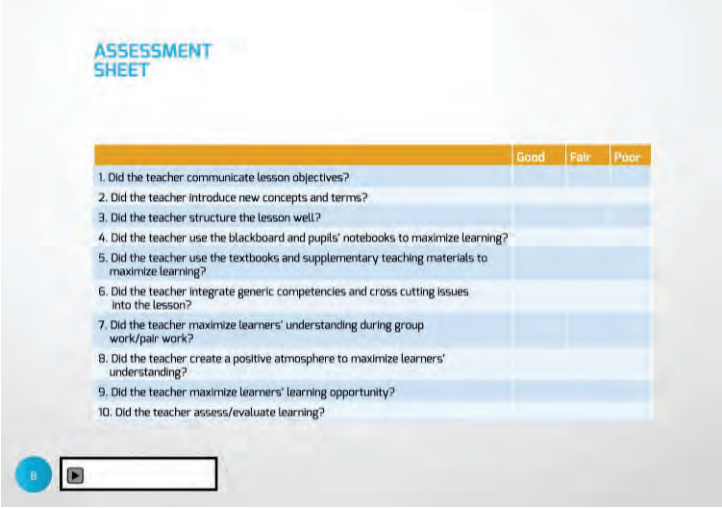

Welcome to the 3rd Phase of the CBC Training.
Our country has introduced new education curriculum, called Competence-based curriculum, in short, CBC, in our schools in 2016.
Then consequently, REB has conducted the 1st phase of CBC training and the 2nd phase, in the past.
So, we have already learnt a lot about basic knowledge and concept of CBC, so far.
However, we are aware that delivery of quality lesson based on the new curriculum requires some times, it can't be done just within a short time like one year or two years.




Therefore, we may need to go back to what we have learnt during the 1st and 2nd phases, and we will identify the gap between the "**Intended CBC**" which is described in our curriculum and syllabus, the "**Implemented CBC**" which is currently practiced by teachers, and the "**Attained CBC**" which has been obtained by our learners. Actually, we have observed some gaps during various school visits.
Therefore, in this 3rd phase of the CBC training, we will learn and discuss practical know-how for teachers to deliver CBC lesson, so that we can narrow the gap

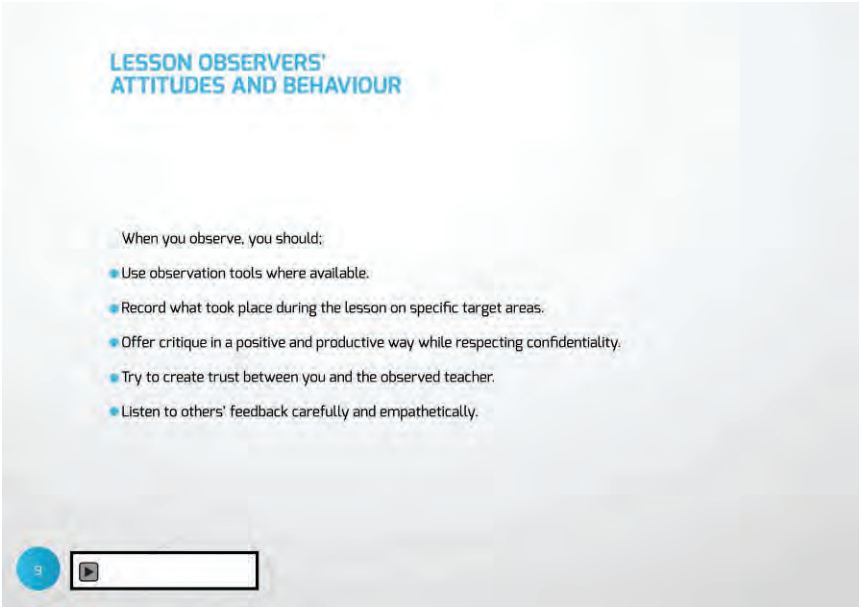



among **Intended CBC**, **Implemented CBC** and **Attained CBC**.




Distribute an assessment sheet to each participant (Appendix 1). From next time, participants are requested to copy the form in their notebooks.

Now before starting training program, let us watch a video clip carefully.
While watching the video, all of you are expected to write down your comments, views, evaluations of the lesson on your notebook and evaluation sheet (assessment sheet). Some advices for the teacher to make his/her lesson into a better lesson are also appreciated. You are also expected not to chat with your friends, not to go out from the room, not to be engaged in any other activities like being busy to send or receive WhatsApp message which is not relevant to this training. I'm saying this, because quality facilitation by trainer and active serious participation will determine achievement of this training. Serious time management by organizers, trainers and participants are also needed.



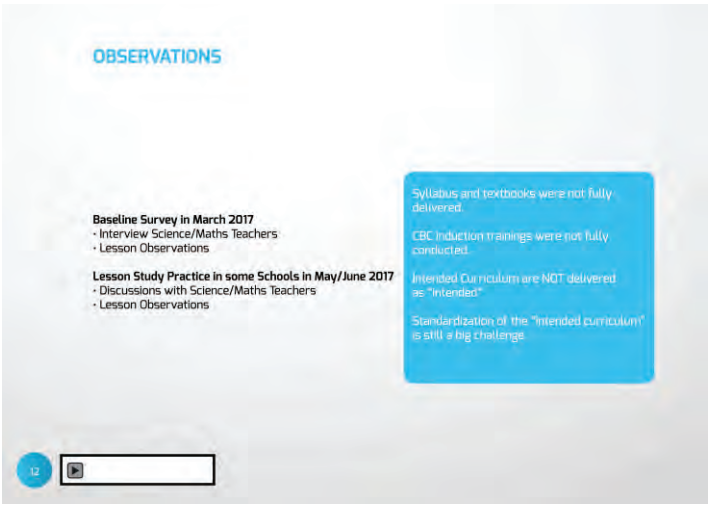

When you observe, you should;
-use observation tools where available.
-record what took place during the lesson on specific target areas.
-offer critique in a positive and productive way while respecting confidentiality.
-try to create trust between you and the observed teacher.
-listen to others' feedback carefully and empathetically.

**VIDEO**

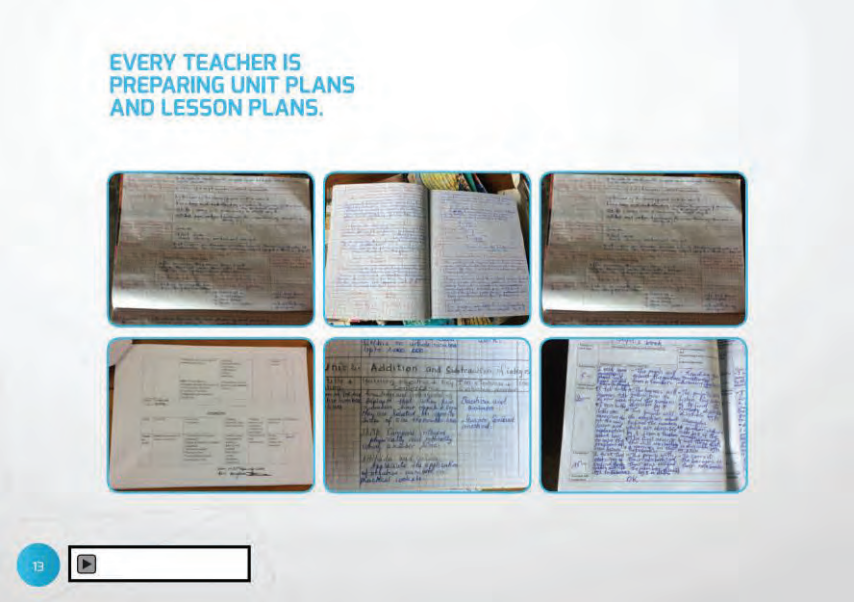
Now that you have watched the movie, let's see together these questions.
How was that? Did she/he perform well? Did you find learners participating actively in the lesson?
Have you finished recording your comments on your notebook or assessment sheet?
Not yet? Then, let me give you some more time, to complete your task – writing assessment on the assessment sheet, with your observations, comments, and reasons why you thought so.
I will give you 3 minutes.
This is individual work, please do this without any consultation or discussion.
This is the end of the session. Let me collect all of your assessment sheets.

**Session 1: Success and Challenges in CBC implementation at Schools Part 1**

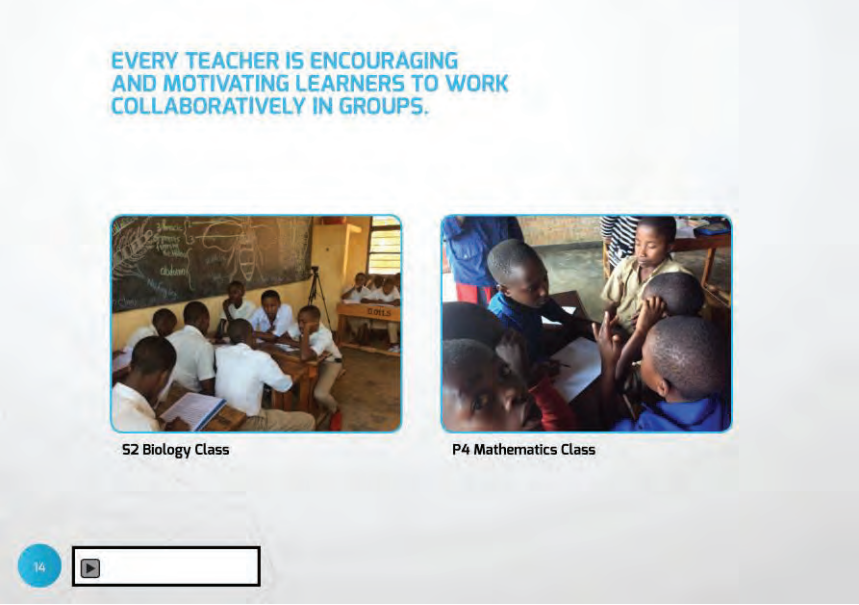
Welcome to session 1 of this training. As you know, newly developed curriculum, CBC, has been introduced to our primary and secondary schools since 2016.
Rwanda Education Board has been delivering new syllabus and textbooks to all public schools, and CBC induction trainings have been conducted twice so that teachers can start to deliver CBC lesson, then our students can benefit from new education curriculum.
To begin with this training session, let me ask these questions to all of you.
Are our children learning actively in our schools?
What is your success story in your school?
What are your challenges to deliver CBC lessons in your school?
I will give you 5 minutes, and then we will share our opinions.



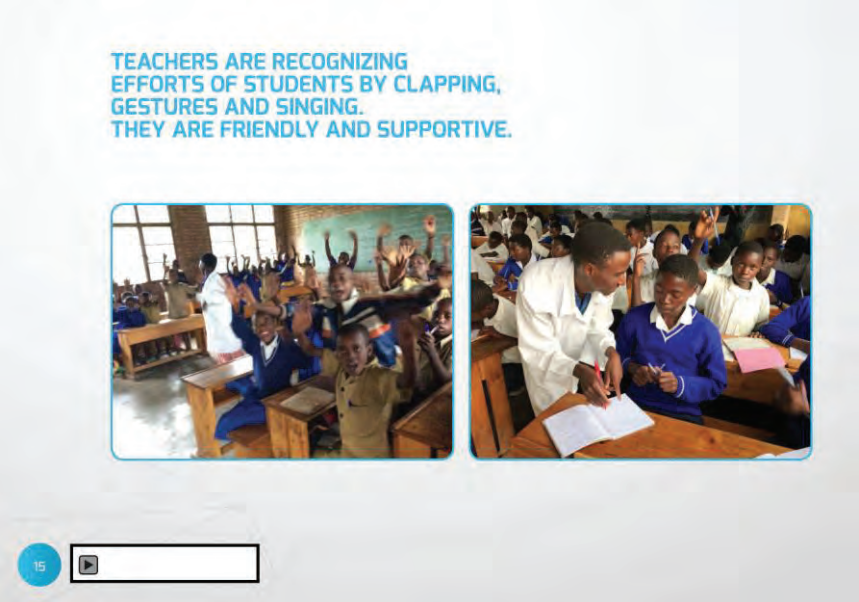

Okay, we have heard different success stories and challenges on the CBC lesson implementation.
The SIIQS Project, for Supporting Institutionalizing and Improving the Quality of SBI, conducted a baseline survey in March 2017, and based on the result of the survey as well as lesson study practice conducted in May and June 2017, we observed that teachers have learned about basic knowledge relating to CBC, and they have started implementing the lessons in their classrooms.
However, it looks like our teachers still have challenges to deliver quality learning for students based on CBC.
So first of all, before we talk about practical know-how to improve your CBC lessons, let us know the current situation, by picking up some information from baseline survey of the SIIQS Project.



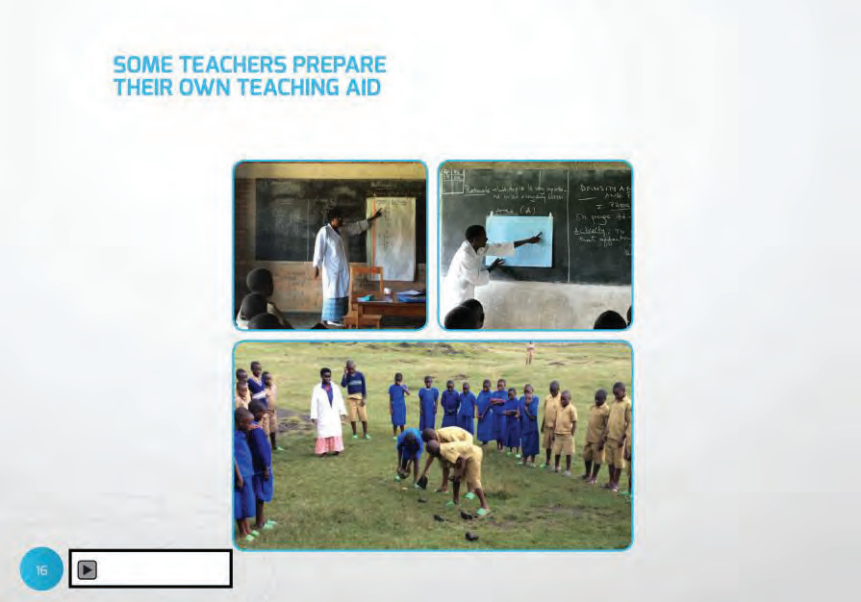

One: Every teacher is preparing unit plans and lesson plans, which is good.



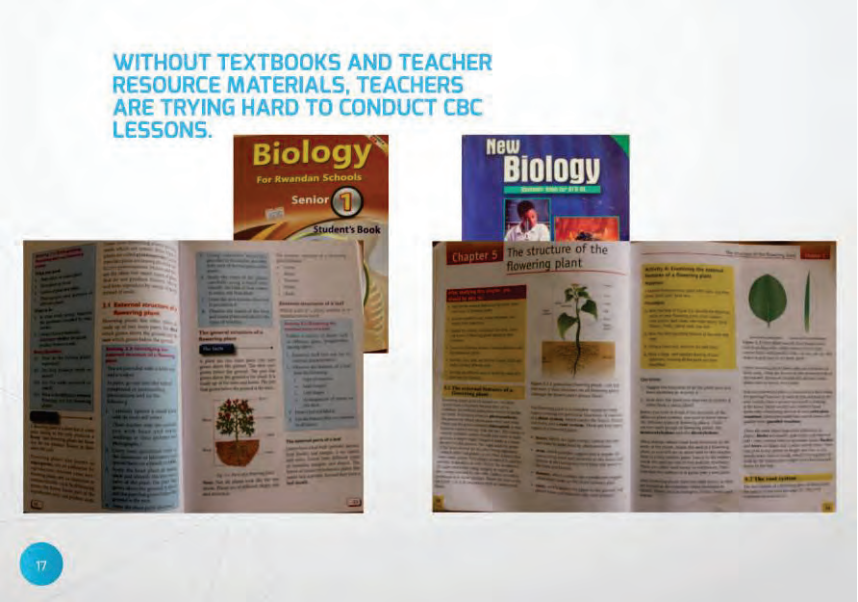

Two: Every teacher is encouraging and motivating learners to work in groups.




Three: Teachers are recognizing efforts of students by clapping, singing, and waiving hands. They are friendly and supportive.



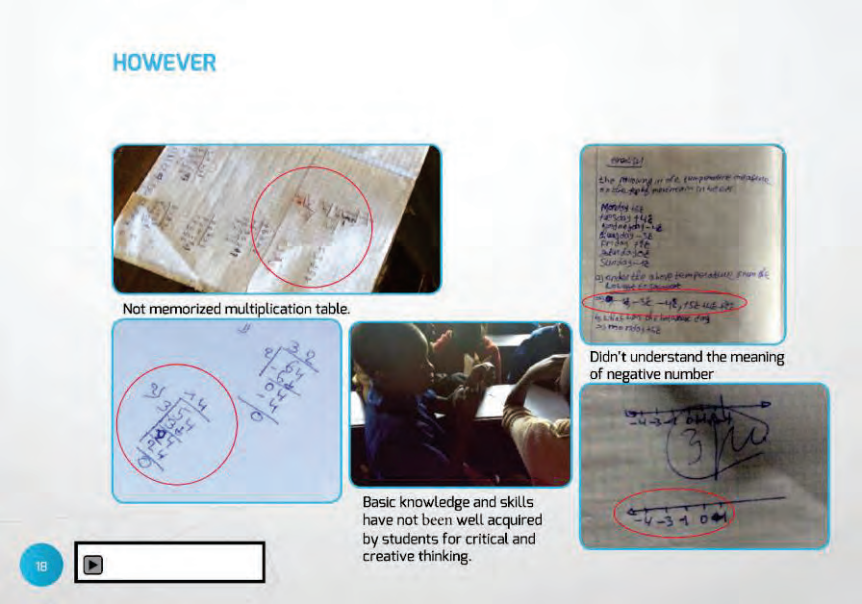

Four: Some teachers prepare their own teaching aids.



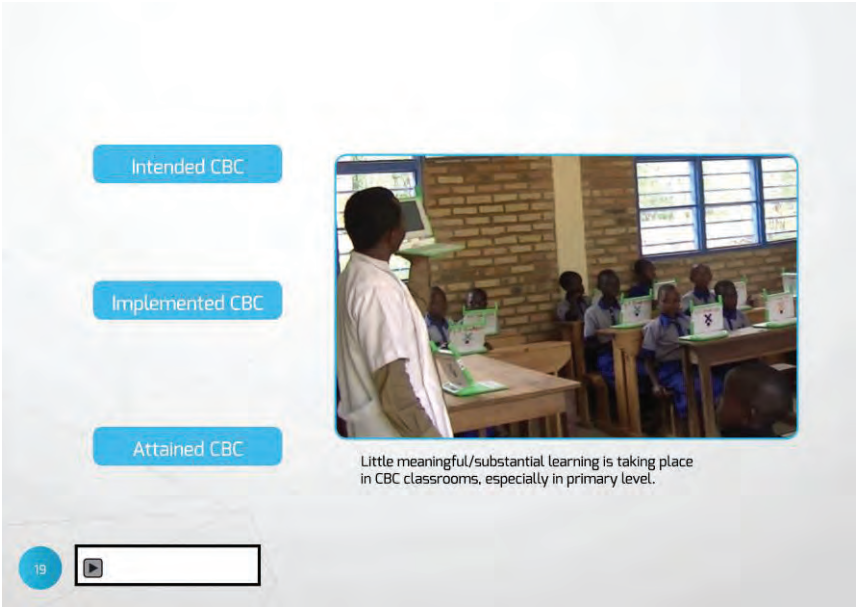

Although, new syllabus and new textbooks were not fully delivered to our schools, teachers are trying hard to conduct CBC lessons.

Supplementary Information

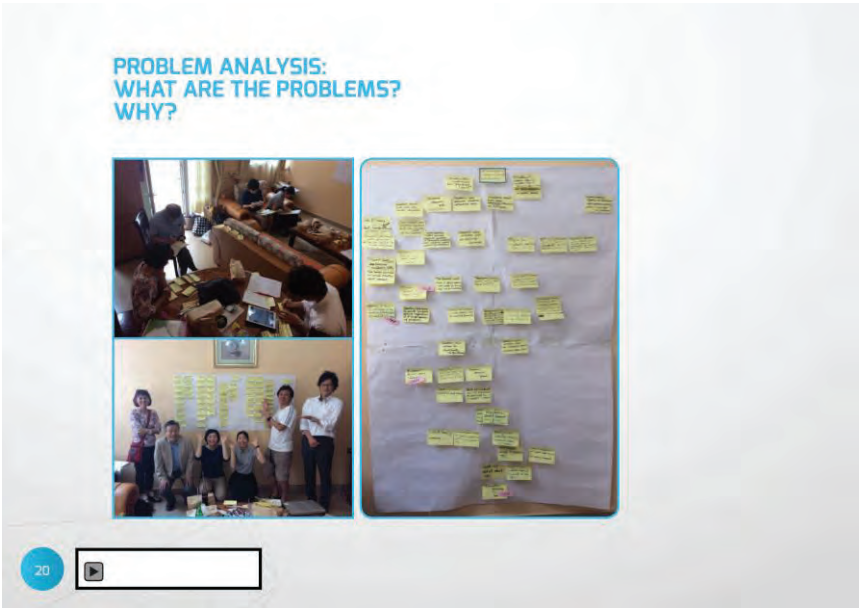
The so called old textbooks may be used since the content is still the same.
The example of "Biology for Rwandan Schools" on the left is a textbook based on CBC for senior 1. "New Biology" on the right is a previously used textbook for senior 1. They contain the same contents. So, teachers can refer to old textbooks until CBC textbooks are delivered to their school.




However, if we pay attention to how learners are learning, we could find little change.
Here are some pictures of their notebooks, where their learning process is recorded.
Many P4 learners have not memorized multiplication table.
Most of them don't understand the meaning of negative numbers.
The majority of learners have not well acquired basic knowledge and skills, which are an important foundation of critical and creative thinking.




So we have to say this.
Although, teachers are trying hard to conduct CBC lessons, meaningful and substantial learning is NOT yet taking place in our classrooms, especially in primary level.
We observed some changes in Teachers' teaching, however, students' learning are still left behind.
In other words, there are still a big gap among intended CBC, implemented CBC and attained CBC, on which we need to pay more attention.




Then, what could possibly be the problems?
Why CBC has not yet benefitted students, while teachers are trying hard to conduct CBC lessons?

We start this analysis from "Reality of students and Classrooms" as per our observations during the survey.

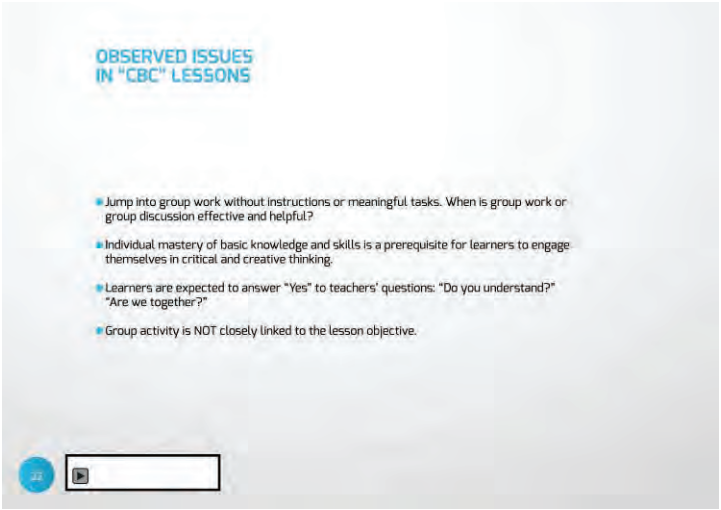
1. Many primary students cannot do easy calculations when they are in upper primary level.
2. The Teacher asks students if they understand or not, then learners automatically answer YES in chorus, even though they don't understand.

Therefore, the classroom is not a comfortable place for both teachers and students, which means not yet a conducive/productive environment for Quality teaching and learning.

Why? Teachers are not happy with slow learners, because they may delay the progress of the lesson. With this kind of mind-set of teachers, learners, in particular slow learners, might be influenced accordingly, and start pretending as if they have understood.

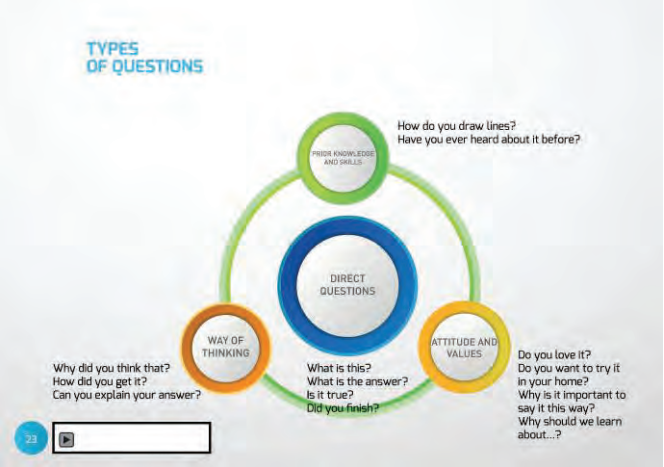
But of course, with this kind of practice, the gap between teacher assessment on learners' understanding and actual learner-achievement is getting wider every day.

We noticed this, by checking learners' notebook, and by watching and listening to their body language carefully when they were asked questions from teachers.

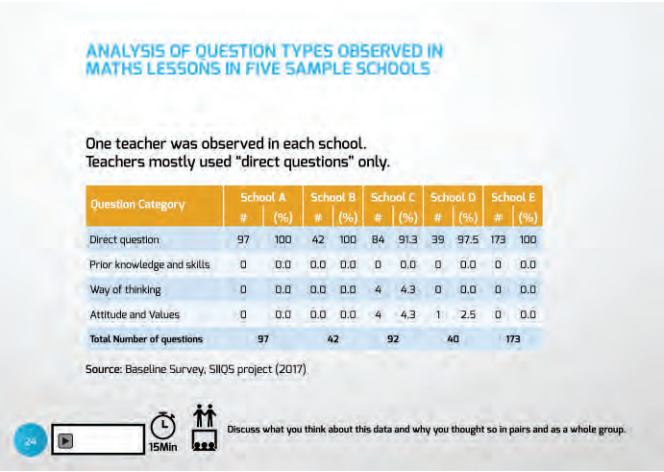



Here is a list of our observations relating to CBC lessons.

1. In most CBC lessons, teachers jump into group work without proper instructions, relevant information or meaningful tasks. Let us discuss on this important issue later, ***When is Group work or group discussion effective and helpful?***
2. Individual mastery of basic knowledge and skills is a prerequisite for students to engage themselves in critical and creative thinking.
3. Students are expected to answer "Yes" to teachers' questions: "Do you understand?" "Are we together?" But there is no option for learners to say NO. Therefore, this form of assessment is not working effectively.
4. Group activity is NOT closely linked to the lesson objective.

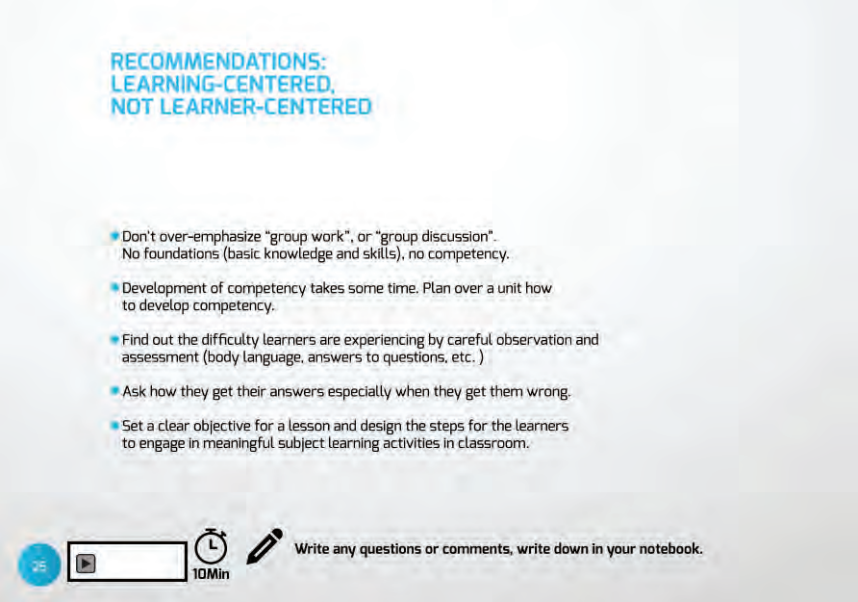



In March, lesson observations were carried out in schools and analyzed the type of questions that teachers actually used in classrooms.
In this analysis, questions are categorized into four types as shown in the diagram.
"Direct questions" indicated at the center are the questions which directly confirm answers or progress of tasks given to learners.
"What is this?", "What is the answer?", "Is it true" and "Did you finish?" are the typical examples of the direct questions.
Besides, we have other types of questions which don't directly ask about the answers or the progress of the task. They are used to develop skills, attitude and generic competences, or to scaffold learners to help their problem solving.
"How do you draw lines?", "Have you ever heard about it before?" are the examples to confirm learner's prior knowledge and skills for achieving tasks.
"Why did you think so?", "How did you get it?" and "Can you explain your answer?" are the examples to ask the way of thinking.
These questions assess to what extent learners think critically or creatively.
Lastly, "Do you love it?" and "Do you want to try it in your home?" are the questions that encourage learners to acquire ideal "Attitude and Values."



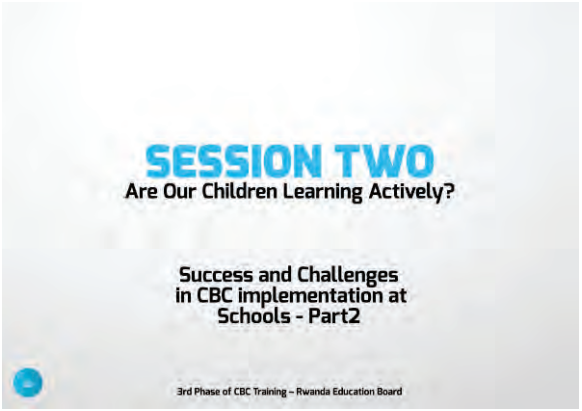

| Question Category | School A | | School B | | School C | | School D | | School E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | # | (%) | # | (%) | # | (%) | # | (%) | # | (%) |
| Direct question | 97 | 100 | 42 | 100 | 84 | 91.3 | 39 | 97.5 | 173 | 100 |
| Prior knowledge and skills | 0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Way of thinking | 0 | 0.0 | 0.0 | 0.0 | 4 | 4.3 | 0 | 0.0 | 0 | 0.0 |
| Attitude and Values | 0 | 0.0 | 0.0 | 0.0 | 4 | 4.3 | 1 | 2.5 | 0 | 0.0 |
| Total Number of questions | 97 | | 42 | | 92 | | 40 | | 173 | |

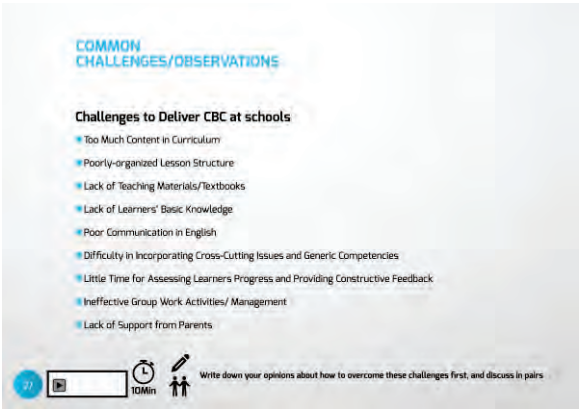
Now we are going to look at the types of questions that teachers actually use. The table shows the result of the analysis in five math lessons observed in different schools. They are labeled A, B, C, D and E.
The table shows the number of questions and percentage of each question.
It clearly indicates that teachers mostly use "direct questions" only. What do you think about this data? Is it a problem? Why or why not?
Let us discuss in pairs for 5 minutes.
Then, share your ideas as a whole group for 10 minutes.




With those observations, here is a list of recommendations.
1. Don't be a slave of "group work", or "group discussion". If there are no proper instructions, relevant information or meaningful task, then they have no foundation (basic knowledge and skills) and no competency.
2. Development of competency takes some time. Don't expect to achieve it in one lesson. Plan over a unit how to develop it.
3. Instead of asking "Do you understand?" or "Are you together?", find out the difficulties students are facing by careful observation and assessment (face expression, answers to questions, exercises, etc.)
4. Ask how they get their answers especially when they get wrong. Provide proper measures to correct their misunderstanding, which must be a golden opportunity for teachers to explain more for slow learners, and they can keep motivation for learning.
5. Set a clear objective of a lesson and design the steps for the students to engage in meaningful subject learning activities in classroom.
Now, here is your first task. If you have any questions, comments, opinions, on this presentation, please feel free to write them down in your notebook.
This is the end of the 1st session.

**Session 2: Success and Challenges in CBC implementation at Schools Part 2**



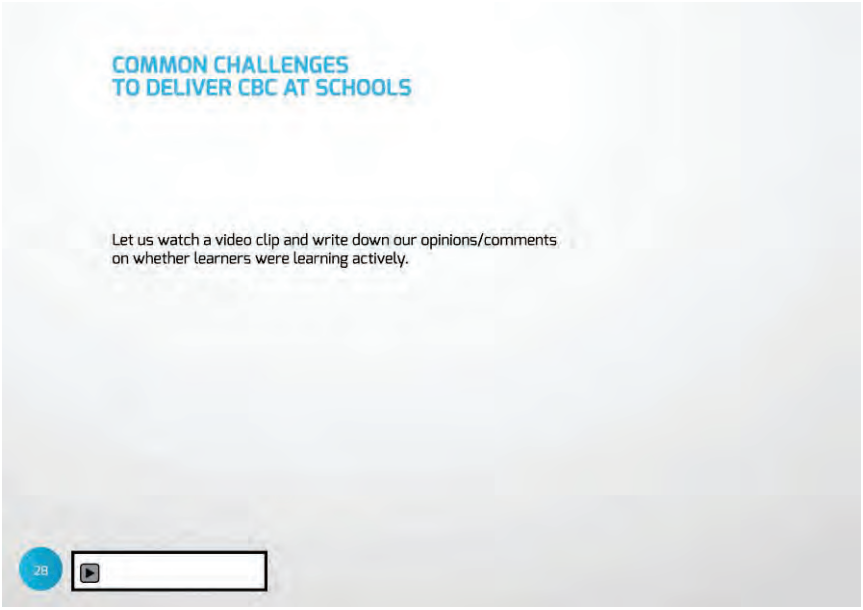

Welcome to the 2nd session.
In the 1st session, we have heard that teachers have started to practice CBC lesson, however, there are more rooms for improvement. Observations and recommendations coming from Baseline survey of SIIQS Project were shared.
Then, in this 2nd session, let us again know the current situation, by picking up some information from Lesson Study Practice of SIIQS Project, where mathematics and science teachers were talking about challenges to deliver CBC in their schools. These are;

- Too much content in curriculum
- Lack of teaching materials/textbooks
- Lack of students' basic knowledge
- Poor communication in English (in particular for primary level)
- Assessing learners progress and providing constructive feedback
- Lack of parents' support
- Incorporating cross-cutting issues and generic competencies into lesson
- Lesson structure
- Ineffective group work activities

Now, we will give you two tasks.
Let us discuss how to overcome those challenges.
Write down your opinions first, for 5 minutes, and then compare them with your friends, for another 5 minutes.

Supplementary Information

Though it is important to develop learners' communication skills in English by interacting with them in English, it is more important to build competences. Therefore, teachers may partly use Kinyarwanda to make learners understand the lesson.

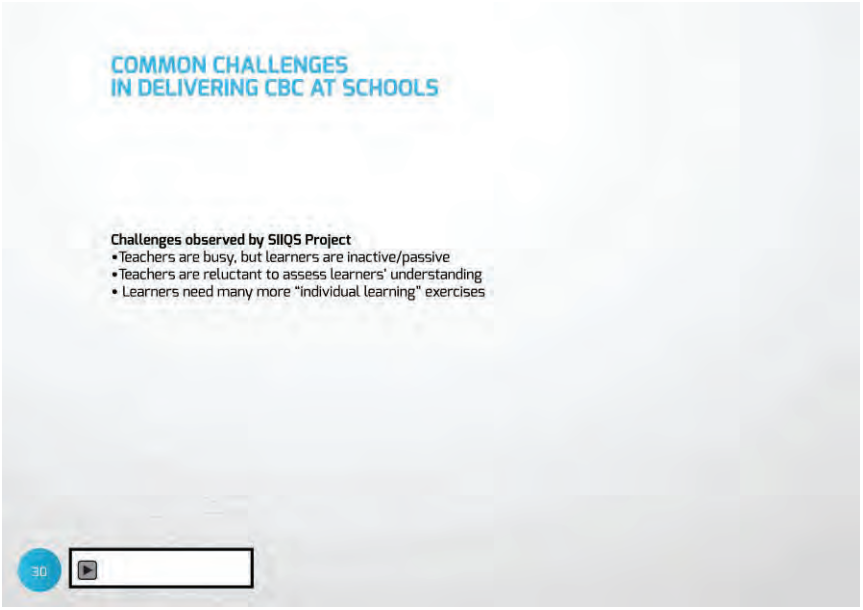



Participants copy an assessment sheet in their notebooks (Appendix 1)

| |
|---|
| Next task is: Let us watch a video clip and write down your opinions/comments if students were learning actively. |

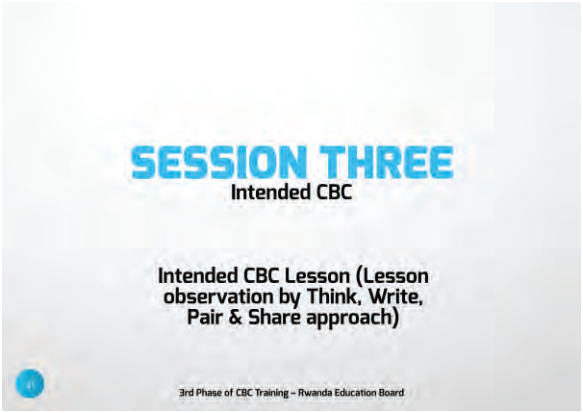
Attention!
This is a math lesson, though the video mentions math, physics and history.

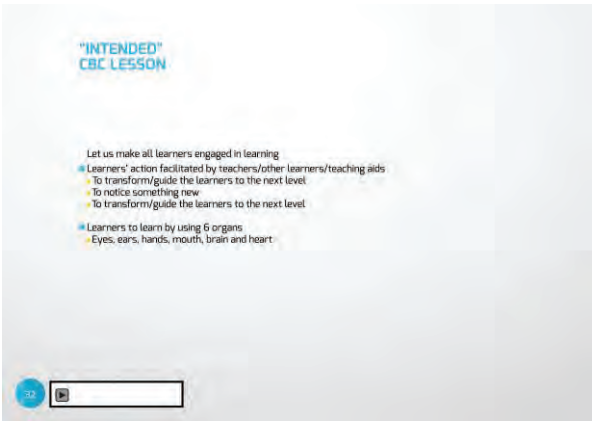
| |
|---|
| **VIDEO**<br>Write down your opinions first for five minutes and then again compare them with your friends, for another 5 minutes.<br>After comparing your opinions with your friends, let us look at challenges observed by SIIQS Project. |




| |
|---|
| Teachers are busy, but learners are inactive/passive.<br>Teachers are reluctant to assess learners' understanding.<br>Learners need many more "individual learning" exercises, especially by using their own hands.<br>We will explain why we thought so, in the later session.<br>This is the end of the 2nd session. |

**Session 3: Intended CBC Lesson (Lesson observation by Think, Write, Pair & Share approach)**




Welcome to the 3rd session.
In the 1st session, we have heard that teachers have started to practice CBC lesson, however, there are more rooms for improvement.
In the 2nd session, we have heard teachers' opinions about their challenges to deliver CBC lesson.
Then, in this 3rd session, let us remember the intention of CBC again.
In CBC, we need to assure equal opportunity to all learners in the classroom, fast learner and slow learner, to be engaged in the learning process actively.
Learning process is learners' action "to notice something new" and "to change and guide them to the next level", facilitated by interaction between teacher and learners or among learners, or assisted by teaching aids, or by themselves.
Needless to say, learning processes take place at their brains which are busy receiving and analyzing new information and keep them in their memories.
For this input process, learners get information/knowledge through eyes, by watching some visuals like blackboard, photo, video, demonstration, textbook and so on. They also get information/knowledge through ears, by listening to teacher's verbal explanations.
However, effective learning process cannot be completed by those input processes only.
It must be well combined with and assisted by output processes;
By using hands, they write down important words or sentences on notebooks, or doing hands-on activities during mathematics and science lessons.
And by using mouths, they talk to the teacher, they express their views/opinions/observations in the classroom, exchange opinions with other learners, and make presentations in the classroom.
When a teacher talks to learners in a gentle and friendly manner, learners are also motivated to learn comfortably without fearing teacher, and encouraged to express what they have learnt.
So, I can say learners are also learning by hearts.

Participants copy an assessment sheet in their notebooks (Appendix 1)

| |
|---|
| Now, let us watch video clip of a lesson, then please observe and evaluate if students are fully engaged in the learning process.<br>After watching the video clip, please write down your own opinions, comments, and advice on how to improve the lesson, without any discussions/consultations with your neighbors. Then finally let us have a pair discussion. Exchange your notebook with your friends and discuss on how you can advise the teacher to deliver quality CBC lessons involving more learners and maximizing learning opportunity for them. |

| |
|---|
| **VIDEO**<br>How was that? Did he or she perform well?<br>Then please write down your assessment on your assessment sheet with your observation, comments, reasons of why you thought so. I will give you three more minutes, then just write down your opinion without any consultation.<br>If we have some more time remaining, let us have a pair discussion – Exchange your notebook with your friend, and discuss on how you can advise the teacher to deliver quality CBC lessons involving more learners and maximizing learning opportunity for them. Five more minutes.<br>This is the end of 3rd session. |

**Session 4: Lesson Planning – Preparation**

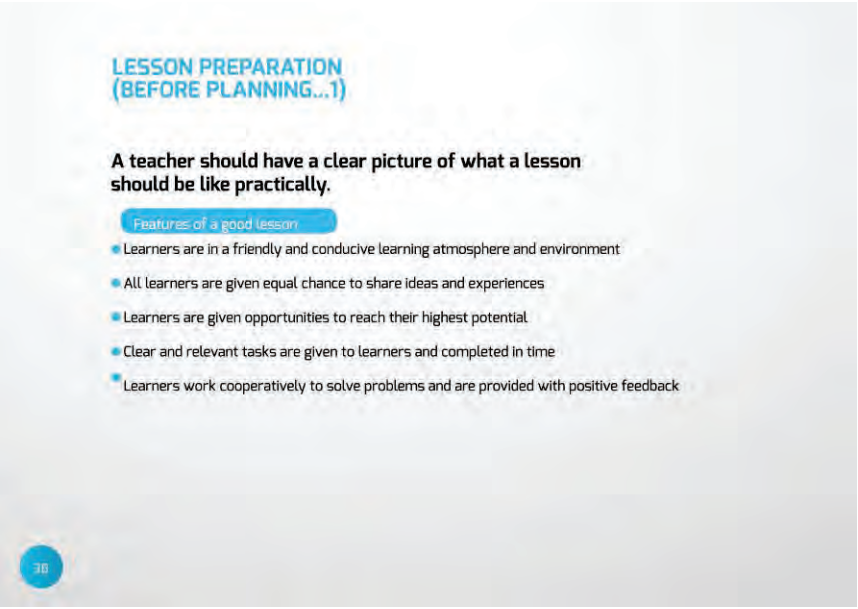
Welcome to the 4th session.
In the past 3 sessions, you have heard the comments and advice about how teachers can deliver CBC lessons, which are picked from SIIQS project's baseline survey and lesson study practice.
You have also watched some video clips and discussed how to improve CBC lesson delivery.
So from now, let us share some practical advice and ideas to improve lesson delivery in your classroom.
In the 4th session, we will focus on **Preparation stage.**
Quality lesson delivery of CBC starts from quality preparation.
Though some parts of the process of lesson preparation should be done once in a year, some others should be done termly, monthly, weekly, or even daily.
The first part must be preparation of a **Scheme of Work,** at the beginning of a school year, perhaps in or before January.
Preparation of a Scheme of Work should be well guided by our **Syllabus**, and we may be able to borrow some ideas from Scheme of Work of the previous year, which must be kept within the school.
After that, once in a term or once in a month, we might revise the Scheme of Work according to the progress of classroom activities. For this purpose, formative assessment by the teacher is very important.
Then, finally, once a week or as a daily activity, teachers are expected to prepare **Lesson Plans** based on **Curriculum**, Syllabus, Scheme of Work, textbook, class size, learners achievement and so forth. But even after preparing lesson plans, you can revise lesson plans according to your observation/assessment of your learners' responses/achievement.
Now, we will look into more detail at what we should do during this preparation stage.

| |
|---|
| Provided with a lesson plan format, individually, draft a lesson plan for your respective subjects in 15 minutes<br>After lesson planning, pair and share with your colleague in 5 minutes.<br>Let us present in plenary, you have 10 minutes. |

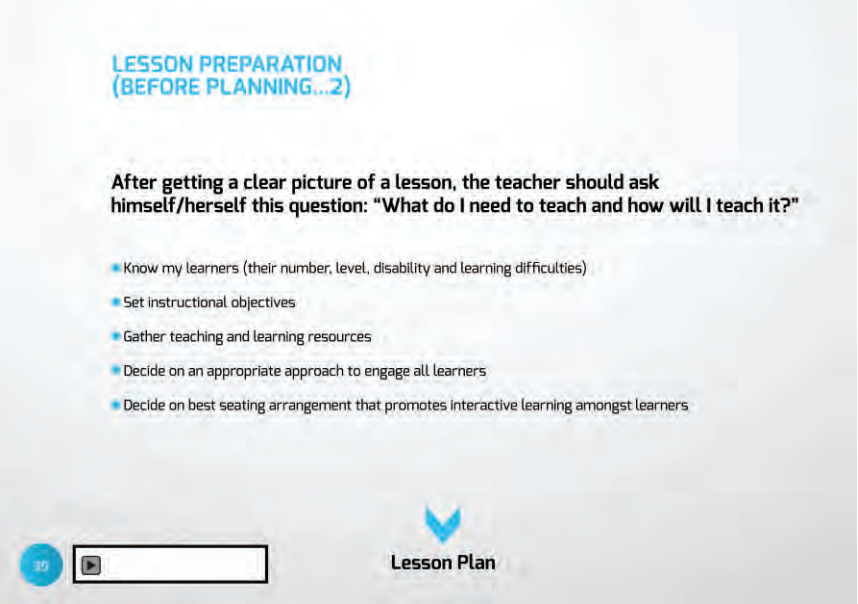
Distribute a lesson plan format to each participant or let him/her use the format that is used in his/her school (Appendix 2)

Supplementary Information

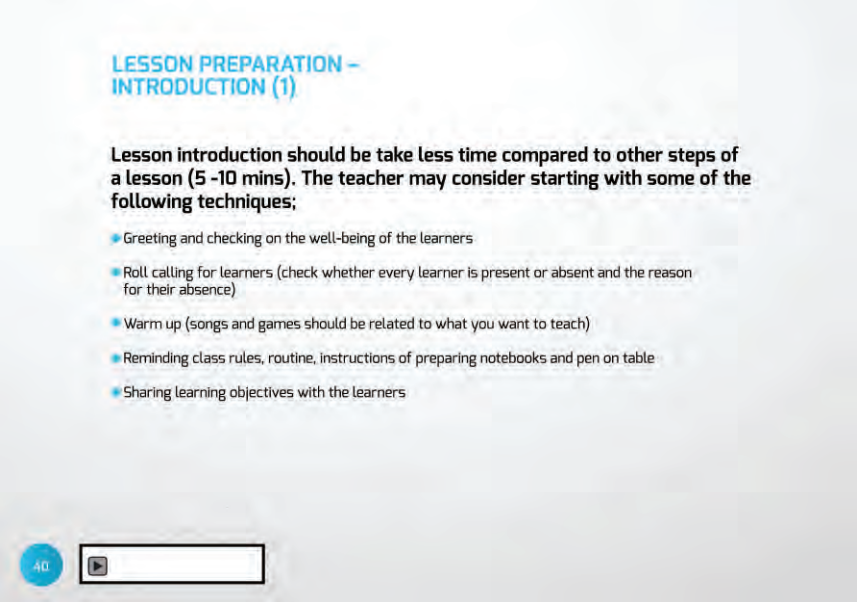
Writing a lesson plan may need more than 15 minutes. It may also fine to allocate more time and do it in groups, or make it homework at the end of Session 3 instead.




| |
|---|
| When a teacher is about to teach a lesson, she/he has a clear picture of what a lesson should be like practically. It must be a good lesson.<br>-Learners are in a friendly and conducive learning atmosphere and environment<br>-All learners are given an equal chance to share ideas and experiences<br>-Learners are given opportunities to reach their highest potential<br>-Clear and relevant tasks are given to learners and completed in time<br>-Learners work cooperatively to solve problems and are provided with positive feedback |



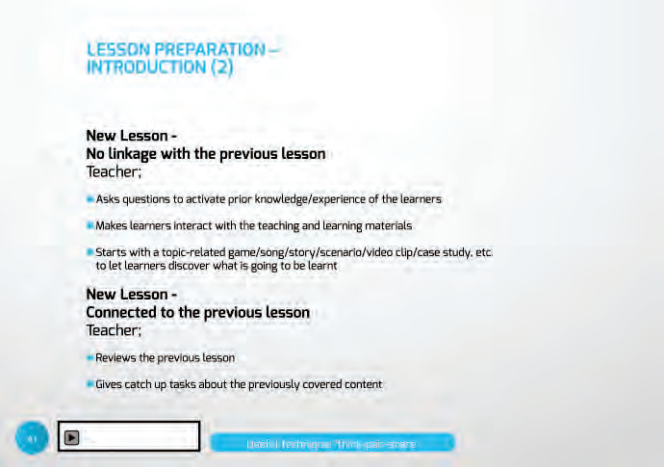

Once the teacher has got a clear picture of what she/he wants a lesson to be like, the teacher should ask himself/herself this question: **"*What* do I need to teach it and *how* will I teach it?"**
-Do I know my learners (their number, level, disability and learning difficulties etc.)
-How will I set instructional objectives
-How will I gather teaching and learning resources
-How will I decide on an appropriate approach to engage all learners
-How will I decide on best seating arrangement that promotes interactive learning amongst learners
That is why the teacher needs a lesson plan which include introduction, development and conclusion.




This is the time for a teacher to organize and structure his/her 40 minutes lesson based on the prior gathered information.
For every stage of a lesson, the teachers ensures cooperative learning through setting different tasks that promote participatory learning.
Any lesson introduction should take less time compared to other steps of a lesson.

The teacher may consider some of the following points;
- greeting and checking on the well-being of the learners,
- roll calling for learners (check whether every learner is present or absent and the reason for their absence)
- warm up (songs and games should be related to what you want to teach)
- reminding class rules, routine, instructions of preparing notebooks and pen on table
- sharing learning objectives with the learners

Now, we are ready to watch more video clips, to talk about practical advice or technical know-how to improve lesson practice.
In those videos, we might notice some DOs and some DONTs. Of course, we want to learn a lot from good practice from the videos, however, we also know that we can learn a lot from any kind of practices if they are not good ones. So, let us start learning from watching DOs and DONTs, sharing our opinions, advices for those teachers, to improve those good lessons for better lessons.
Now, we will focus on "Introduction stage" of the lesson plan.
We will give you some advices, and some requirements which must be included in the introduction stage.
After that, we will watch a video clip, followed by discussions for your deep understanding.

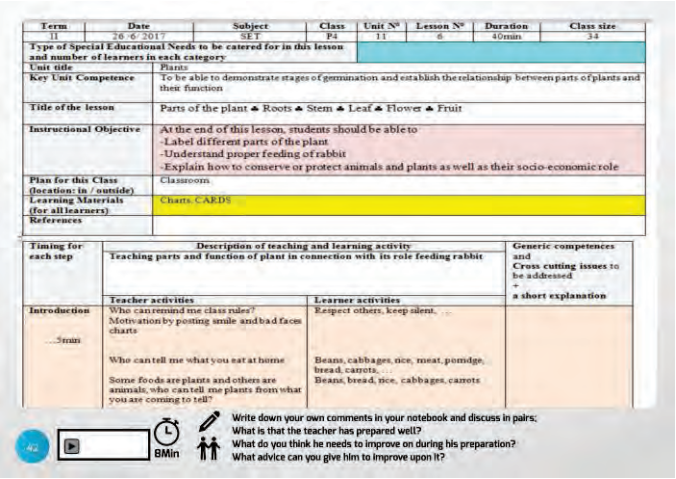



If the new lesson is not linked with the previous one,
the teacher;

- Asks questions to activate prior knowledge/experience of the learners
- Makes learners interact with teaching and learning materials
- Starts with a topic related game/song/story/scenario/video clip/case study, etc. to let learners discover what is going to be learnt

If the new lesson is connected to the previous one,
the teacher;

- reviews the previous lesson
- gives catch up tasks about the previously covered content



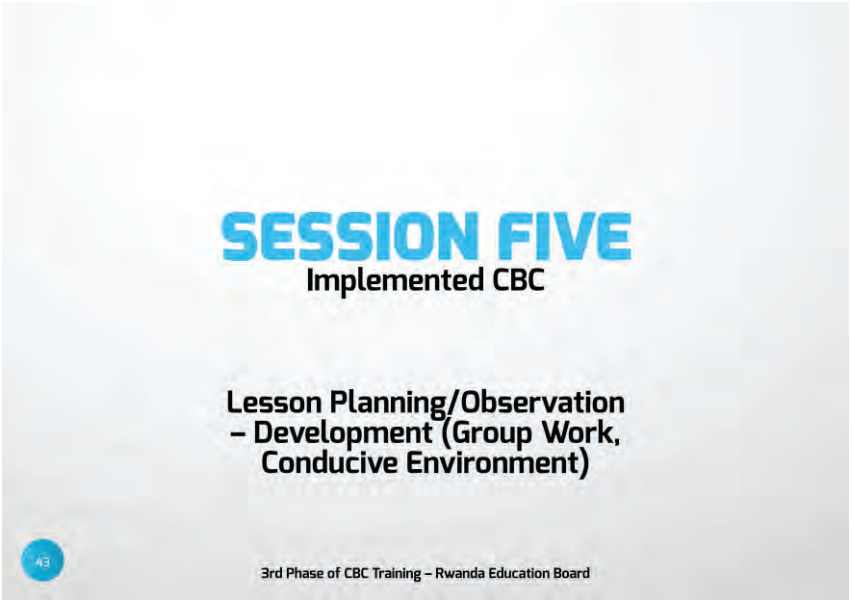

Distribute a lesson plan sample to each participant (Appendix 3)

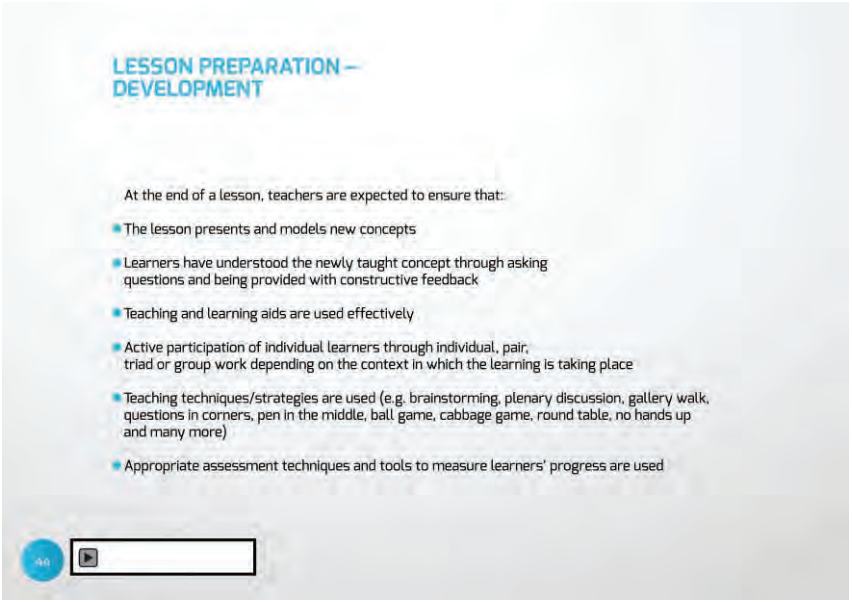
Now let us observe a part of a lesson plan sample and discuss on how the teacher started his/her preparation. Your focus in this slide will be on: learners, instructional objectives of the lesson, materials gathered and organized activities in the introduction.
Observe the photo.
Write your comments in your notebook.
Pair with a partner and discuss.

What is that the teacher has prepared well?
What do you think he needs to improve on during his preparation?
What advice can you give him to improve upon it?

This is the end of 4th session.

**Session 5: Lesson Planning/Observation – Development (Group Work, Conducive Environment)**



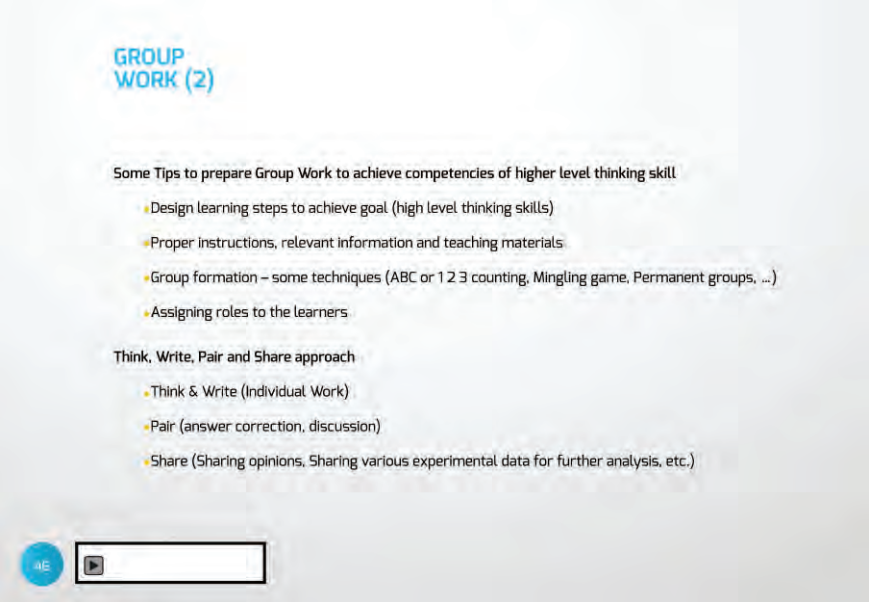




Welcome to the 5th session.
In lesson development, a teacher facilitates and supports learners to understand a new concept.
Learners are also given opportunity to discuss, experiment and challenge each other on the learnt content.
-Teachers are expected to ensure that:
-The lesson presents and models new concepts
-Learners have understood the newly taught concept through asking questions and being provided with constructive feedback
-Effectively use of teaching and learning aids stimulating learners' interests and needs
-Active participation of individual learners through individual, pair, triad or group work depending on the context in which the learning is taking place.
-Leaners' potentials are maximally explored by using various teaching techniques and strategies: brainstorming, plenary discussion, gallery walk, questions in corners, pen in the middle, ball game, cabbage game, round table, no hands up and many more.
-The teacher uses appropriate assessment techniques and tools to measure learners' progress

As mentioned earlier, group work is quite popular practice among many of the teachers trying to practice CBC lessons.
However, in many cases, group work is not assisting learners effectively, due to various reasons.
Generally speaking, group work requires more time than individual work, and pair work.
Therefore, there is no justification for a teacher to go for group work, unless learners are expected to achieve competencies of higher level thinking skills.
Additionally, in the worst case, group work might spoil learning opportunity for slow learners, as we have frequently observed that a few fast learners dominate learning activities in the group work.
In order to ensure enough learning opportunities for all learners in their classroom, consider **Think, Write, Pair and Share approach**.
Every learner's potential is explored and developed where she/he has got time for own thinking, develops writing skills, shares with a partner to peer assessment and decision-making, and thereafter presents their findings in plenary.

Supplementary Information

Group work is not always necessary in CBC lessons. Lecture-type lessons are also useful in building up learners' knowledge. Therefore, teachers must consider carefully about what activities would be appropriate when making a lesson plan.

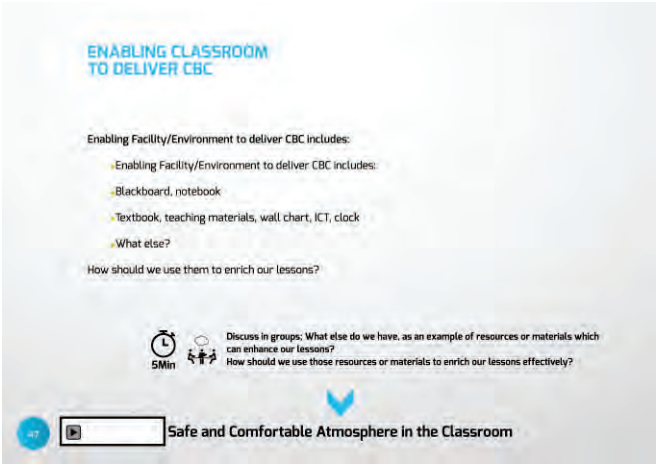



Of course, group work is an important teaching technique to provide learning opportunity, in which learners are expected to gain higher level thinking skills. Therefore, a teacher needs to carefully plan group work - starting from designing learning steps to achieve lesson objectives, related to high level thinking skills.
Then accordingly, after designing learning steps, proper instructions, relevant information and sufficient teaching materials should be provided for learners.
There are several techniques of forming groups and it depends on the teacher's purpose, the number of children in the classroom. However, the teacher chooses a techniques that will not take him/her much time.

Here are some examples of group formation techniques:

- ABC or 123 counting (those who counted the same letter of number will form one group)
- Mingling game (where the teacher says out a number and learners group themselves according to number instructed by the teacher)
- Permanent groups (where the teacher forms groups in which learners will be working every time she/he assigns them a task)

Assigning specific roles to the individual learners in the group might keep them focused on the given task and more it develops leadership skills into learners at their early age.




As one of the challenges to deliver CBC, teachers are feeling that textbooks are not sufficiently available.
For example, I can say that we cannot miss blackboard as a part of the classroom, and it is a useful tool for teacher to provide knowledge for learners, and record learners' response, learners' discussions, and later to be shared by everybody.
Notebooks for learners are also an important tool, so that learners can record all necessary contents taught during the lesson, including the structure of learning process.
Textbooks, and any other supporting teaching materials, including wall chart, ICT, clock for time management, can also assist teachers and learners, obviously.
What else do we have, as an example of facility or materials which can enhance our lessons?
Then, how are we supposed to use those facility or materials to enrich our lessons effectively?
To conclude this slide, we also would like to remember that a friendly atmosphere in the classroom is a basic condition for learners to express their views, exchange opinions, enjoy discussion, and say NO to teacher when they have not understood the lesson.

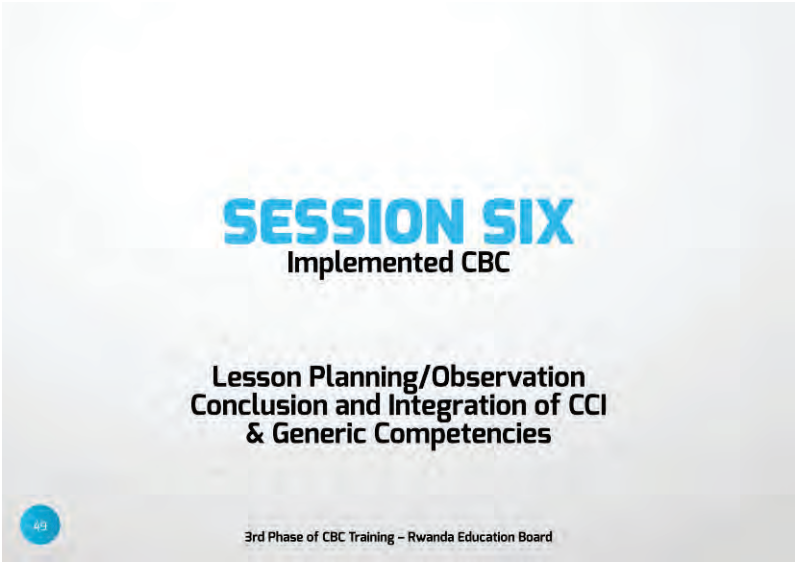
Attention!
The video is a history lesson in S2, though it displays HIST/S4.

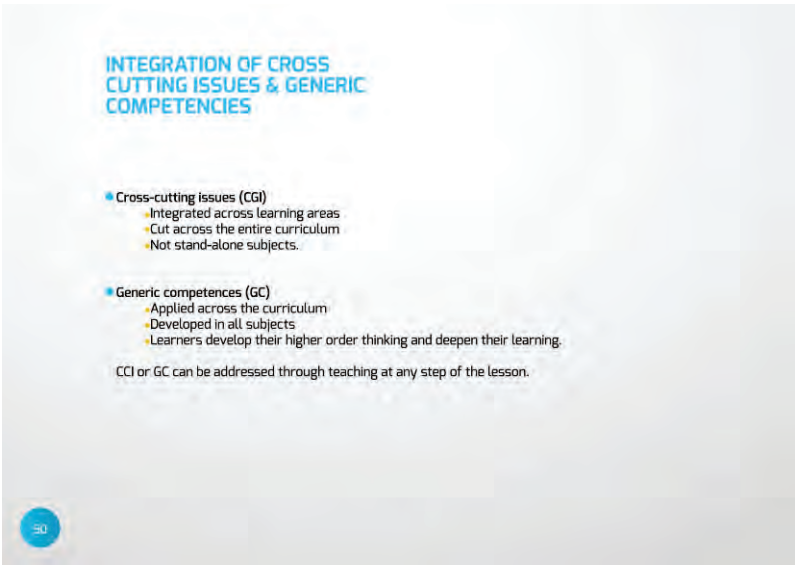
Participants copy an assessment sheet in their notebooks (Appendix 1)

Now, let us watch a video clip and assess the lesson, focusing on;
Group formation and utilization,
Effective use of resources (charts, textbooks, …), and
Conducive classroom atmosphere.

VIDEO

**Session 6: Lesson Planning/Observation – Conclusion & Integration of CCI & Generic Competencies**



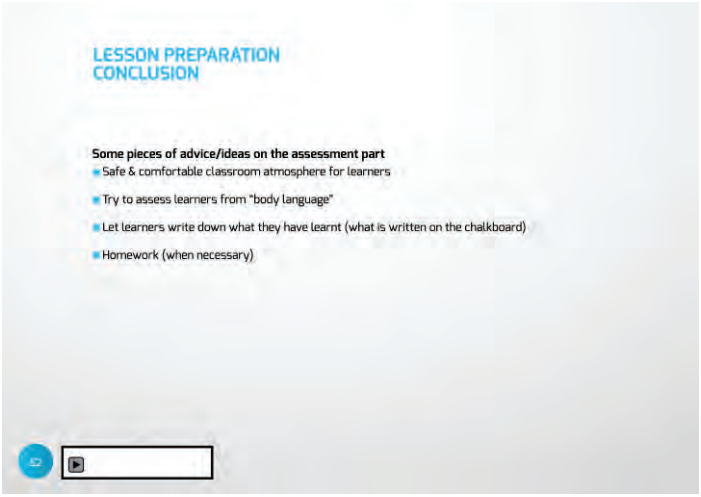

Welcome to the 6th session, which is wrapping up active learning.
Here, let us talk about integration of Cross Cutting Issues and Generic Competencies of learner's progress, and the conclusion.
There is a misconception among most of the teachers that to integrate cross-cutting issues or generic competences in a lesson, one needs to mention them in the middle of the lesson, yet any integrated cross-cutting issue or generic competence is covered through organized learning activities and questions a teacher sets for the learners.
Now, having in mind what we explained in this session, let us watch a video clip and assess how cross-cutting issues and Generic competences are integrated in the lesson.
While watching, please write down on the assessment sheet your observations, comments and reasons for your thoughts.

Participants copy an assessment sheet in their notebooks (Appendix 1)

**VIDEO**

How was that? Did he perform well?

Let us have a pair discussion for 5 minutes – Exchange your notebook with your colleague, and discuss on how you can advise the teacher to deliver quality CBC lesson involving more learners and maximizing learning opportunity for them and how well to integrate cross-cutting issues and Generic competences in the lesson.




In order to grasp the degree of comprehension of children efficiently, it is necessary to have an atmosphere and trust relationship that allow children to freely express their own feelings. Let us make your classroom as a safe place where students can enjoy learning and say "No" when they don't understand what you teach.
Learners' performance will be finally examined by national exam paper, then they need to write down their knowledge and ideas on papers. Let us give them enough opportunity to write down important words, sentences, and concepts relating to the objectives of the lesson in their notebooks.
A conclusion is a summary of what has been taught. In an effective conclusion, the teacher sets questions or learning activities which prompt learners to share, either orally or in written form, the lesson learnt from the covered content.

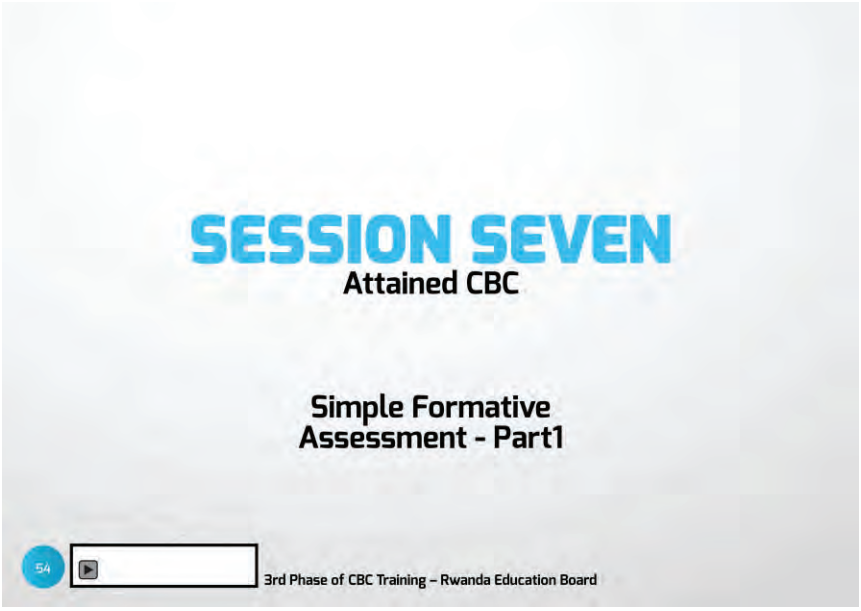
As the teacher ends his/her lesson, the teacher may consider giving homework to the learners for further practice at home and afterwards thank learners for their participation and attendance.

Participants copy an assessment sheet in their notebooks (Appendix 1)

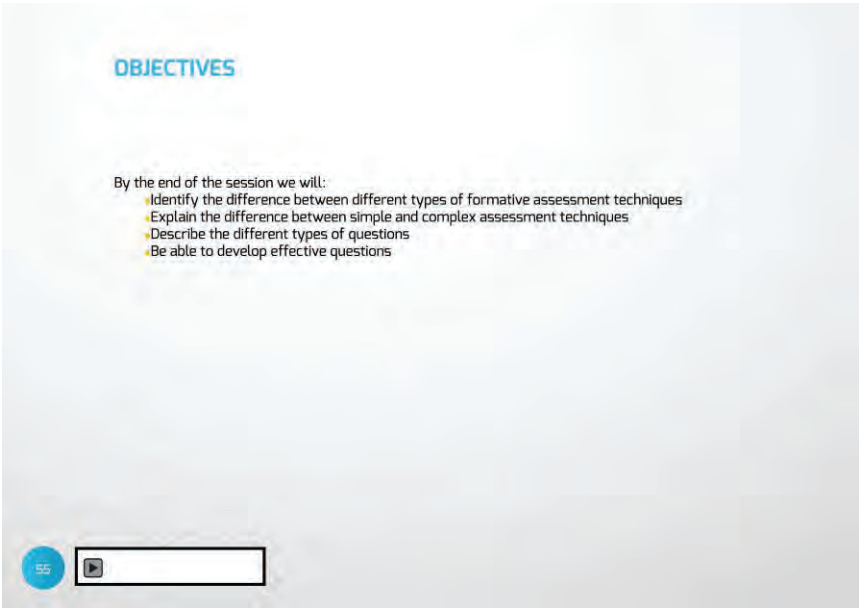
**VIDEO**

How was that? Did she perform well?
Let us have a pair discussion for 5 minutes– Exchange your notebook with your colleague, and discuss how you can advise the teacher to deliver a quality CBC lesson by conducting a good lesson conclusion.
This is the end of the 6th session.

**Session 7: Simple Formative Assessment 1**



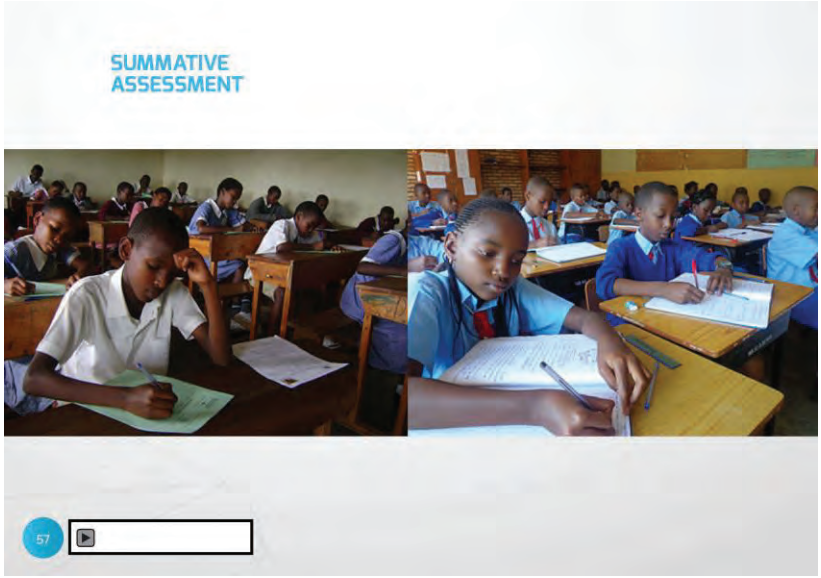

From this session, we will talk about Formative Assessment, which is a continuous process for teachers to understand how learners are involved in the learning process in the classroom. The intention of formative assessment is not only to examine their academic performance, but to encourage teachers to carefully observe learners' behavior/responses. Consequently, teachers are expected to assure achievement by all learners, from fast learners to slow ones.
So regular and frequent formative assessment by the teacher is critically important for delivering CBC.



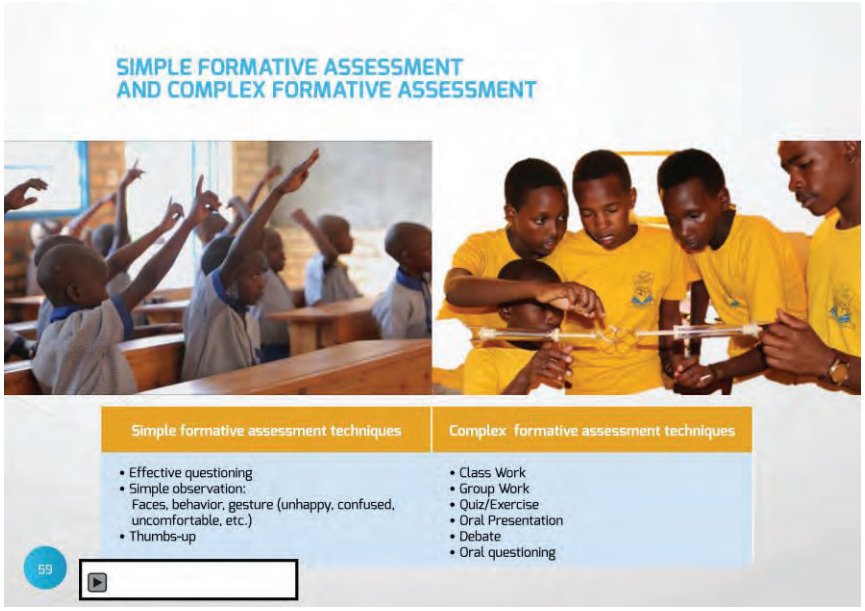

Welcome to session 7.
The objectives of this session are to identify the difference between different types of formative assessment techniques, to explain the difference between simple and complex assessment techniques, to describe the different types of questions and to be able to develop effective questions.

Competence-based assessment is an assessment process in which a learner is confronted with a complex situation which is relevant to his/her everyday life and asked to look for a solution by applying what has been learned such as knowledge, skills, competences and attitudes.

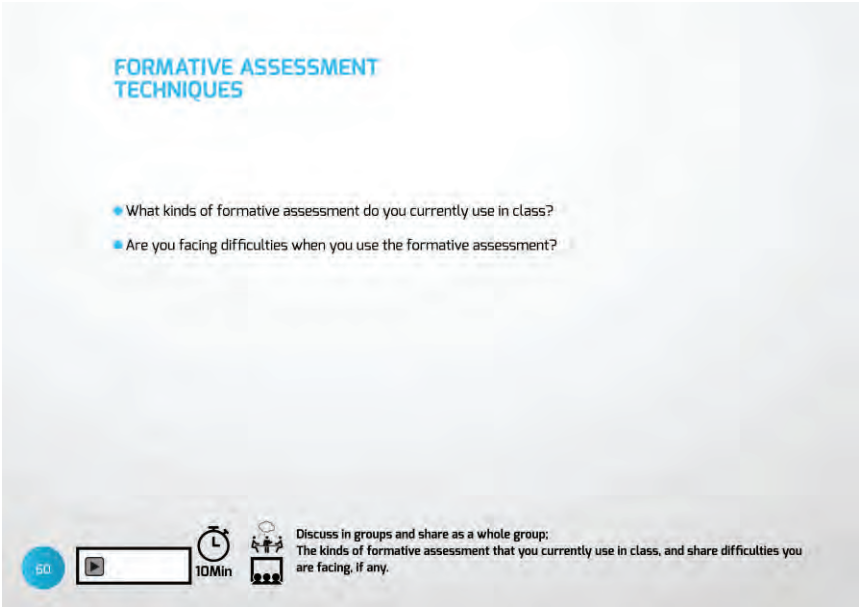
The teacher then collects evidence of learning and uses it as the basis on which to make judgments concerning learners' progress against performance criteria.
Before any assessment is carried out, teachers should be clear about why they should assess, what to assess, when to assess and how to do the assessment. This will depend on whether assessment is formative or summative.




Summative assessments are used to evaluate learner learning, skill acquisition, and academic achievement at the conclusion of an instructional period, such as the end of a project, unit, course, term, school year and cycle. Many teachers are familiar with this type of assessment.
Formative assessment is the daily monitoring of learning to provide ongoing feedback that teachers can use to improve their teaching and learners use to improve their acquisition of competences.
Formative or continuous assessment helps teachers to assess curriculum learning objectives at short intervals of time, and provide effective remedial instruction for slow learners, or enrichment activities for high achievers.




In this session, we will focus on formative assessment. As you can see from this chart, some kinds of formative assessment can be simple to use in class, while others are more complex. Complex assessment tasks are used to assess the comprehensive performance or generic competences of learners.
We will firstly look at simple formative assessment techniques in this session and session 8. Then we will look at complex formative assessment techniques in session 9 and we will learn about assessment tasks in session 10.

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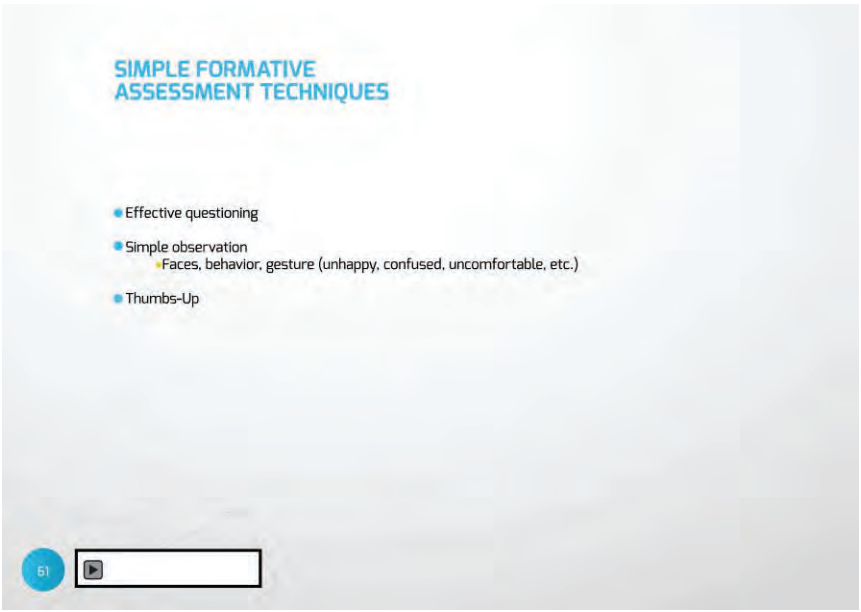
| Work in groups and discuss the kinds of formative assessment that you currently use in class, and share difficulties you are facing, if any. Work together for 5 minutes.<br>After discussing, share together as a whole group for 5 minutes. |

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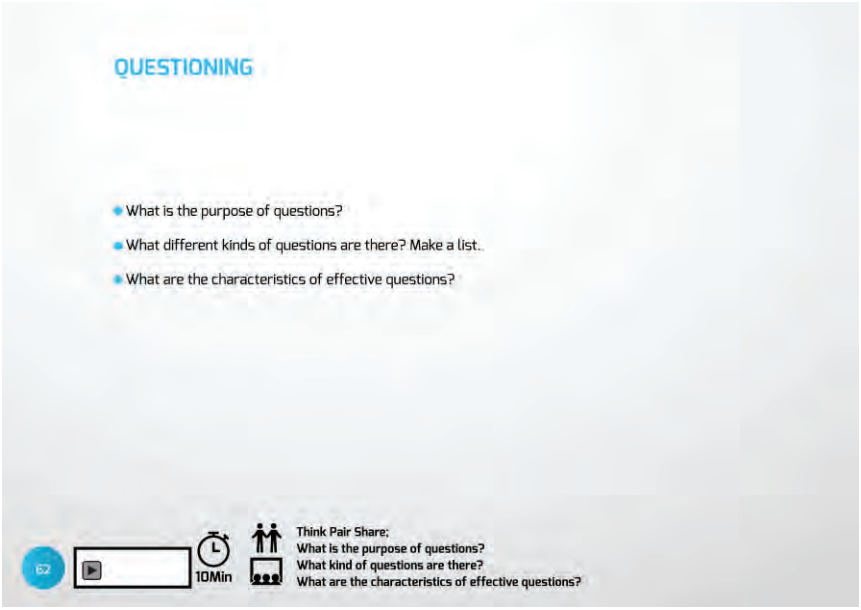
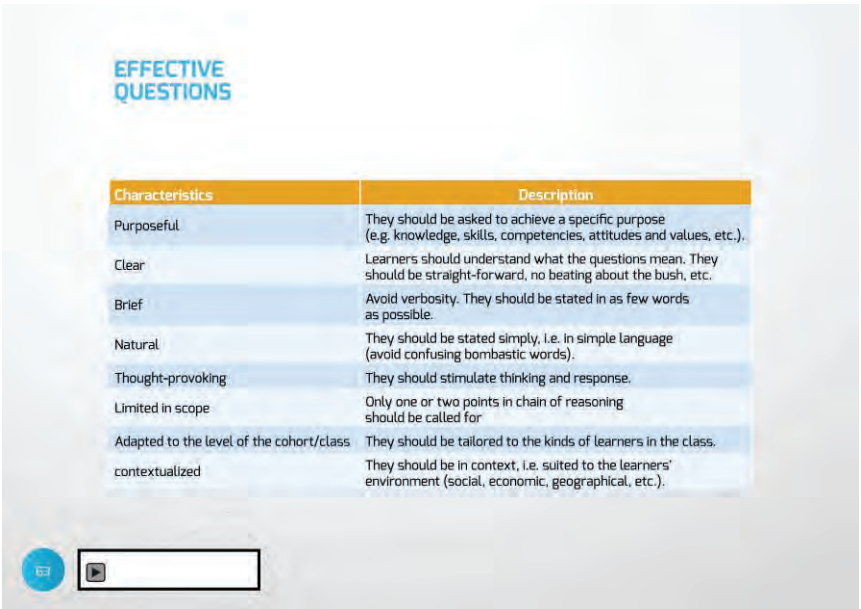
| Some of the easiest forms of formative assessment are: effective questioning, simple observation, and “Thumbs-Up”. |




Use Think, Pair, Share to discuss the questions, "What is the purpose of questions?", "What kind of questions are there?" and "What are the characteristics of effective questions?" for 10 minutes.
Asking questions is one of the most common activities that a teacher does. But did you know that there are different types of questions that a teacher can ask? As teachers, we are usually busy asking questions, but we often don't analyse them. Most teachers ask simple questions which only require learners to recall knowledge or facts. But we need our questions to do more than this. By asking questions, we can encourage learners to discover, to apply their knowledge, and to develop critical thinking skills.




This table shows what effective questions are like.
They are purposeful as they should be asked to achieve a specific purpose.
They are clear as learners should understand what the question means.
They are brief as they should be stated as few words as possible.
They are natural as they should be stated in simple language.
They are thought-provoking to stimulate thinking and response.
They are limited in scope as only one or two points in chain of reasoning should be called for.
They are adapted to the level of the cohort/class.
They are contextualized as they should be suited to the learners' environment.

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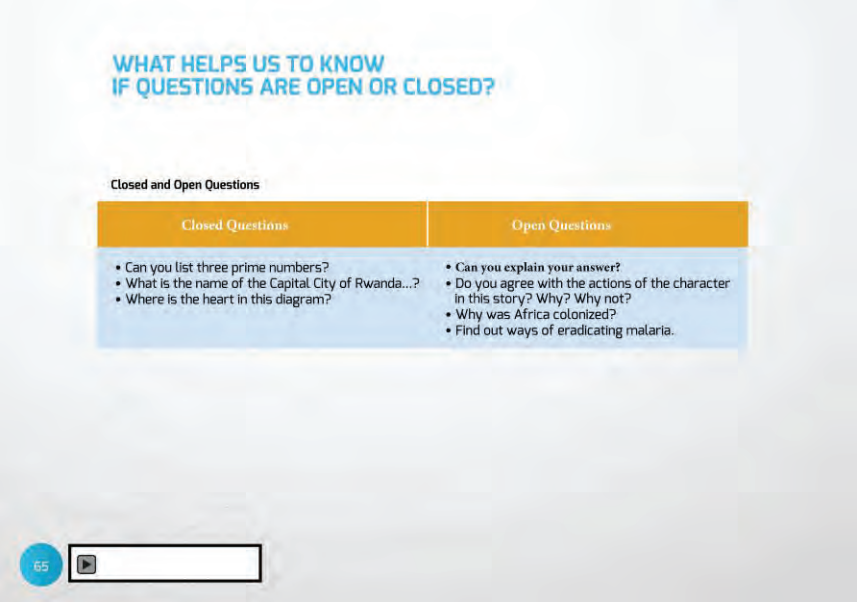
| We are now going to look at effective questioning.<br>There are some techniques which teachers are using in schools.<br>Is there anything we should add to this list?<br>Share ideas in pairs for 3 minute.<br>Take 5 minutes to share ideas with the whole group. |

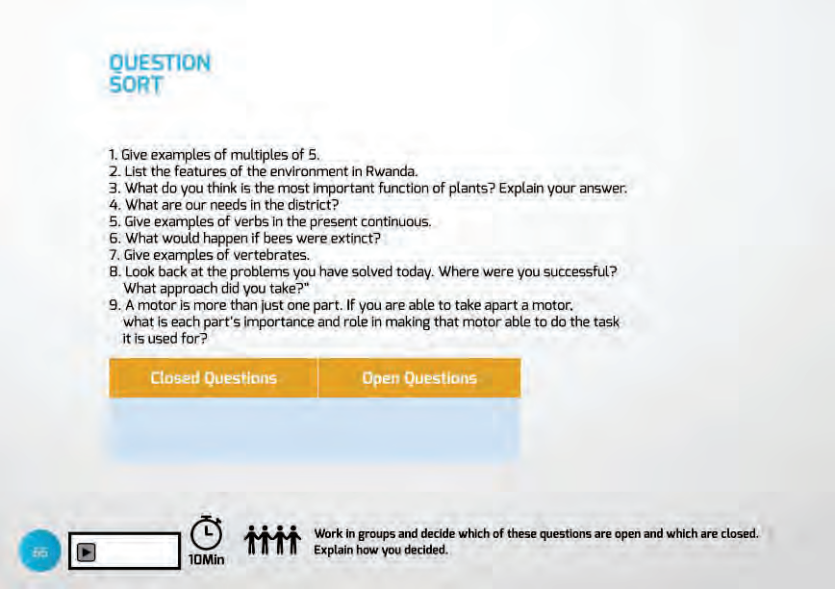



Let us look at the table.
There are questions that require several possible correct answers. We call them open questions. Those that need only one or two answers are called closed questions.
Some questions only test learners' memory. These are called lower-order questions. Some questions require learners to apply what they have learned and think very deeply. These are known as higher-order questions.

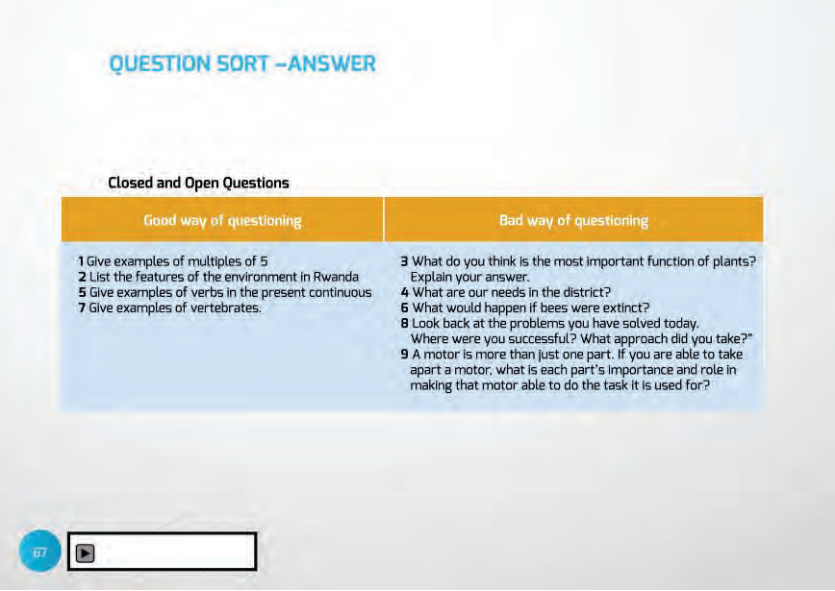
The easiest way to recognise different questions, is to think about the number of possible answers that it has. If there are many possible answers, they will often show you that it is an open question. If there are one or two, this will often show you that it is a closed question. But we should keep in mind that even if there are many possible answers, some are closed questions. These questions just require recalling prior knowledge or comprehending the situation, and can be answered by single words or short sentences. Another technique is to analyse key words or phrases in the question. Words such as *who, what, when, where, name, list etc.…* are often used for closed questions.

Open questions are higher order questions which require learners to take additional steps in order to answer them. Learners have to use logic and reasoning, they have to apply what they have learned, or they have to use their own thinking in order to answer them. The keywords in these questions are words like *discuss, interpret, explain, evaluate, compare, if… etc.*

Some teachers avoid using higher-order questions in class because they generate many different answers. But actually, learners benefit a lot from these questions. When using higher-order questions in class, teachers can discuss all correct answers, and correct the incorrect ones. The more your learners use higher-order thinking skills, the more confident and competent your learners will become.
*Closed questions have short, fixed answers. Open questions have more than one answer and can produce a lot of information.*




To help us understand which questions are closed, and which are open, we are going to practice sorting these questions.
You have 10 minutes. Work in groups and decide which of these questions are open and which are closed. Explain how you decided.



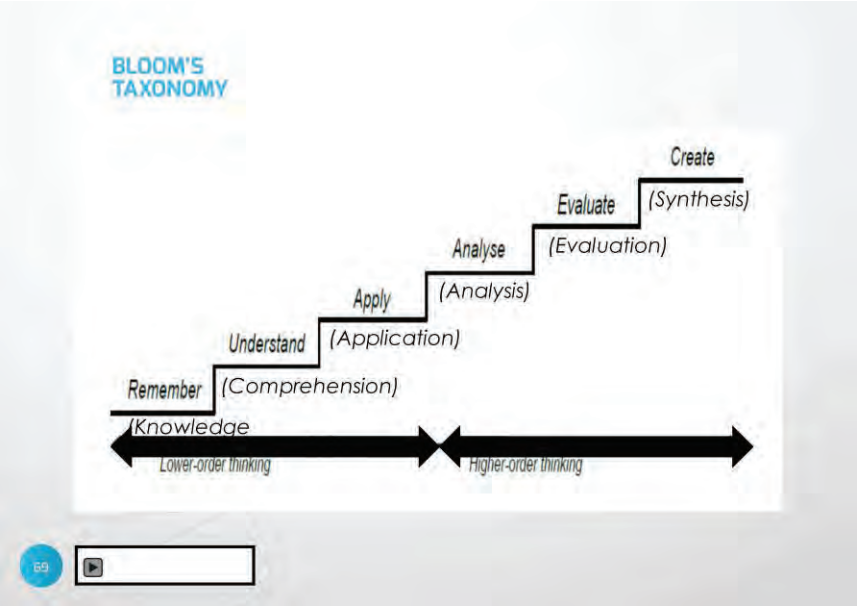

This is the answer. Were you able to distinguish the deference between closed and open questions?

Attention!
The heading of the table is not correct. Please tell participants that the left should be closed questions and the right should be open questions.

Supplementary Information

Some participants may have thought that No.2, 5 and 7 are open questions because there are many possible answers. You may remind them that even if there are many possible answers, these questions just require recalling prior knowledge or comprehending the situation, and can be answered by single words or short sentences. Open questions are higher order questions which require learners to take additional steps in order to answer them. Learners have to use logic and reasoning, they have to apply what they have learned, or they have to use their own thinking in order to answer them.

Work together in groups to discuss the questions. You have 5 minutes.




Share your answers together as a whole group for 5 minutes.

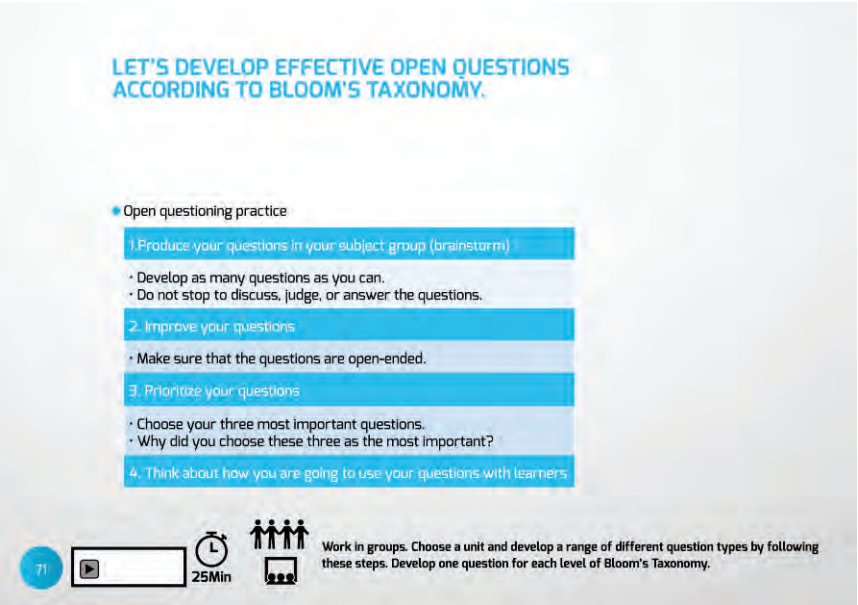
Thinking critically is a competency that can be developed, and without critical thinking many aspects of learning cannot take place. For example, creativity, imagination, problem solving skills, innovation, and application all require critical thinking.

Questions can encourage Learners to discover and explore. Learners need to be involved in their learning, and a good way for teachers to promote this is by asking challenging questions to develop learners' critical thinking skills.

When asking different kinds of questions, it is important to move from simple to complex, as learners cannot answer very complex questions without first being able to answer simple questions.
Bloom's Taxonomy can also help us to develop different levels of questions which require different levels of thinking.

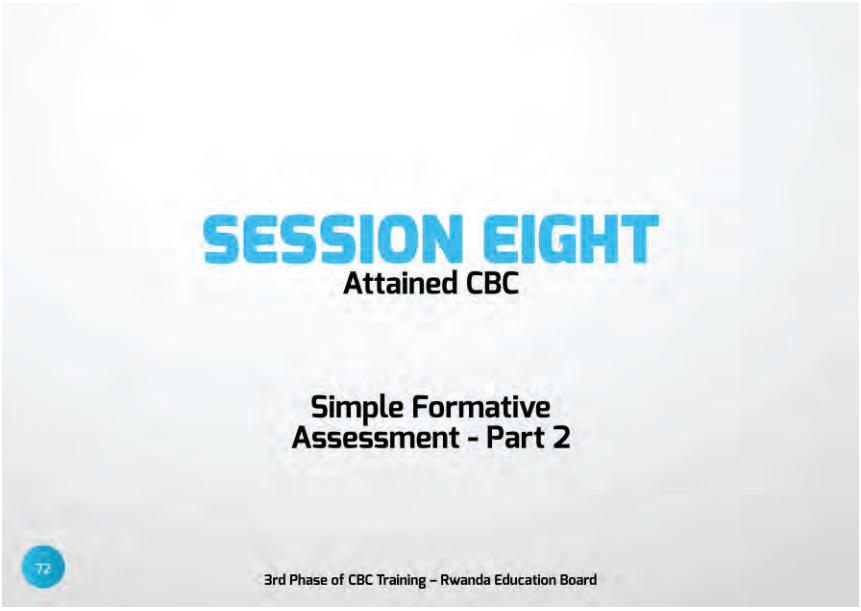
Distribute Bloom's Taxonomy to each group (Appendix 4)

When planning a lesson, it is helpful to check the levels of Bloom's Taxonomy to see what you are asking your learners to do, and what level of thinking is needed to achieve each task.
This chart can help us plan the types of questions that we can ask in a lesson, or over the course of a unit.
Work in groups with other people who teach your subject. Look in textbooks for your subject to find questions for each level of Bloom's Taxonomy. You have 15 minutes. You can organize the questions into a table which you can use to help you plan the questions you ask in class.




Now we are going to develop our own questions which will be useful for us to use for the units we teach.
Choose a unit and develop a range of different question types by following these steps. Develop one question for each level of Bloom's Taxonomy. You can use the list to help.
You have 15 minutes.
Share your ideas in pairs for another 10 minutes.
This is the end of the 7th session.

**Session 8: Simple Formative Assessment 2**



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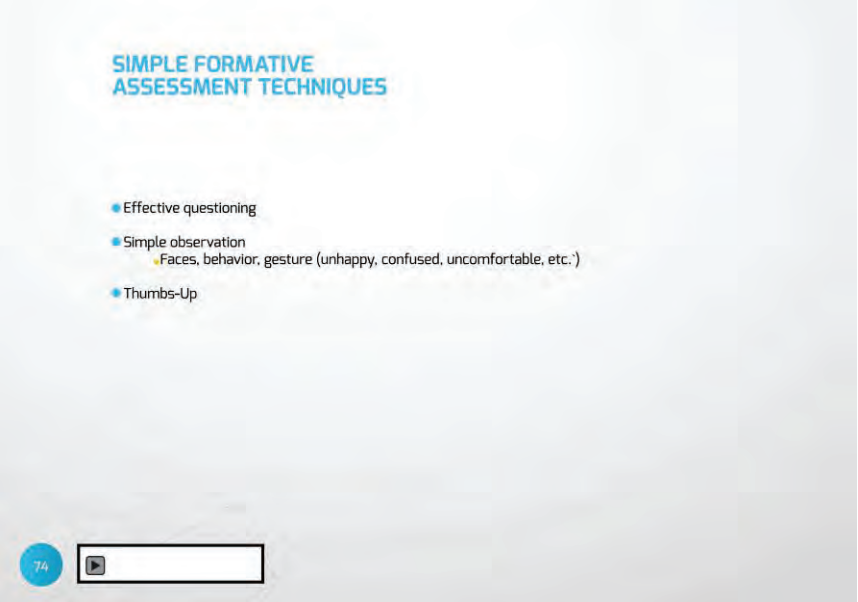
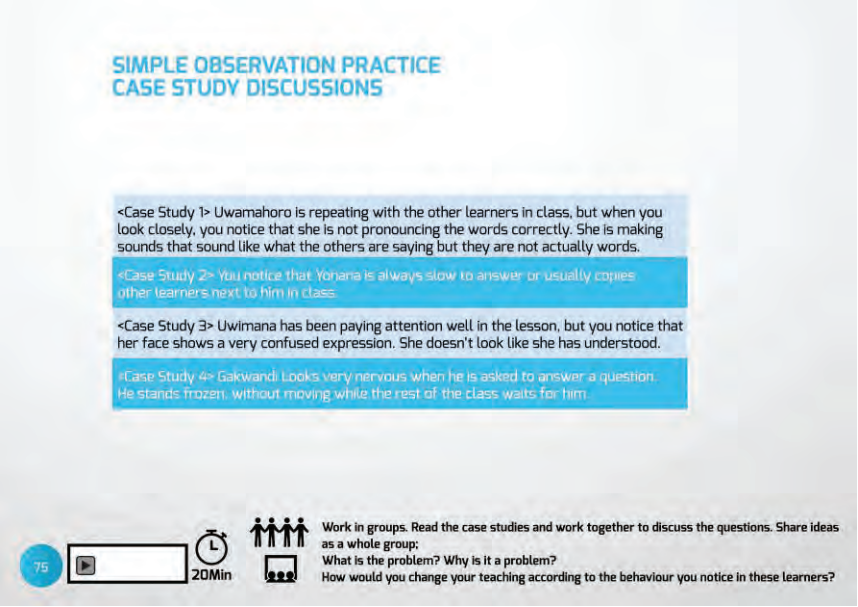
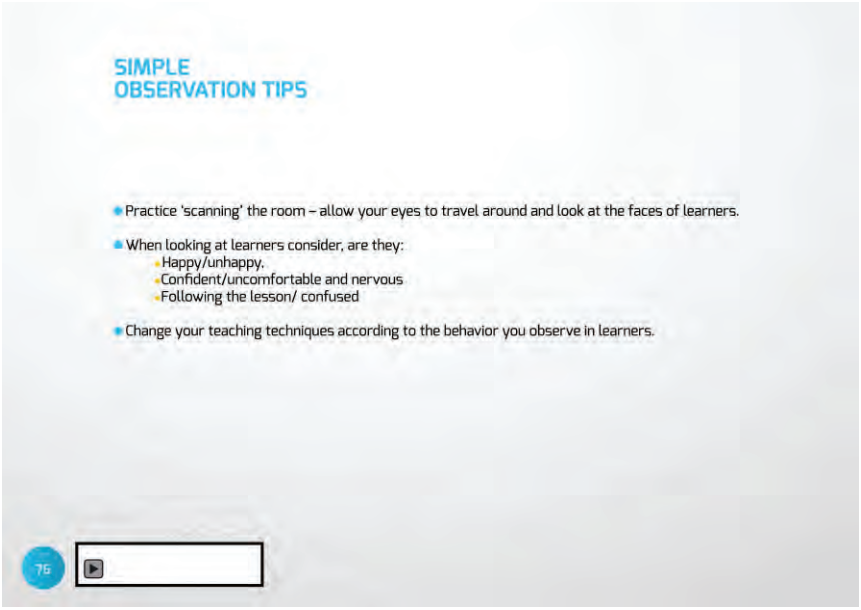
| Welcome to the 8th session.<br>The objectives of this session are to describe simple formative assessment techniques and to understand how to use simple formative assessment techniques in the classroom. |



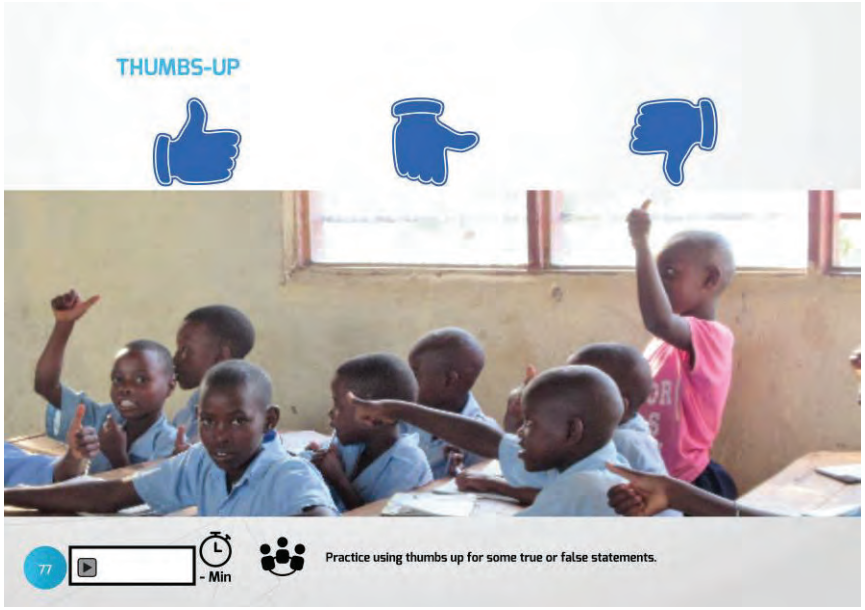

Some of the easiest forms of simple formative assessment are: effective questioning, simple observation and "Thumbs-Up".




Let's start with simple observation.
Work in groups. Read the case studies and work together to discuss the question for 10 minutes
Share ideas as a group for 10 minutes.
These are common learners' behaviours that we can observe.




Now, here are some simple observation tips.
When you are in your classroom, allow your eyes to travel around and look at the faces of learners.
You may find various situations that learners encounter at the same time.
Do they look happy or unhappy? Are they confident or uncomfortable and nervous?
Do they seem to be following the lesson or do they seem confused?
Simple observation gives you a lot of information about learners. You may have to change your teaching techniques at any time you think it is necessary, according to the behavior you observe in them.



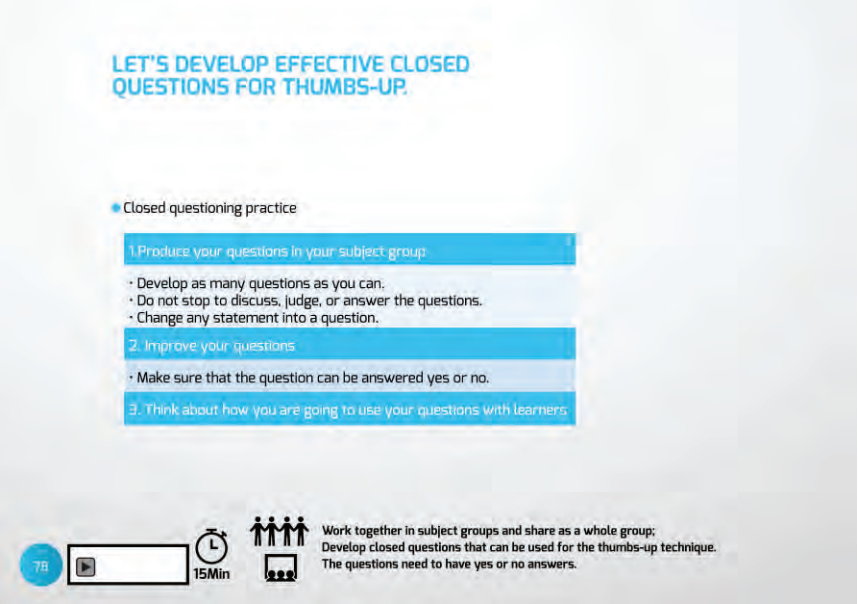

Now we are going to consider Thumbs-up.
Thumbs up is a very simple assessment technique that can be used to encourage all learners to think in class, and can also be used as a form of assessment. It can be used in all subjects.
You will need to practice this technique with learners to make sure they are all familiar with it. You need to explain to learners that you will say a sentence. If they agree with that sentence, (that means if it is true) they show you by putting their thumbs up. If they don't agree they show thumbs down. If they are not sure, they can hold their thumbs sideways.
You need to explain to learners, that it doesn't matter if they don't show the correct answer, because if they get the answer wrong, you will know what to teach them next.
We will now practice using thumbs up for some true or false statements:

- 20 divided by 2 is 10.
- 40 divided by 2 is 15.
- 30 times 3 is 100
- 20 times 5 is 100

As teachers, we need to observe how learners are responding to these questions. While learners are showing their answers, we can look around the room and see who is correct, who has not understood and who is not sure (We know this by seeing which learners are slow to show their thumbs, or are looking around at others before answering). This acts as a form of assessment.
Let's try again. with another subject:

- Water evaporates when it is cold
- Water changes into a gas when it is heated
- Condensation is when water is released from plants

Very good. Now we will develop questions for thumbs-up in subject groups.

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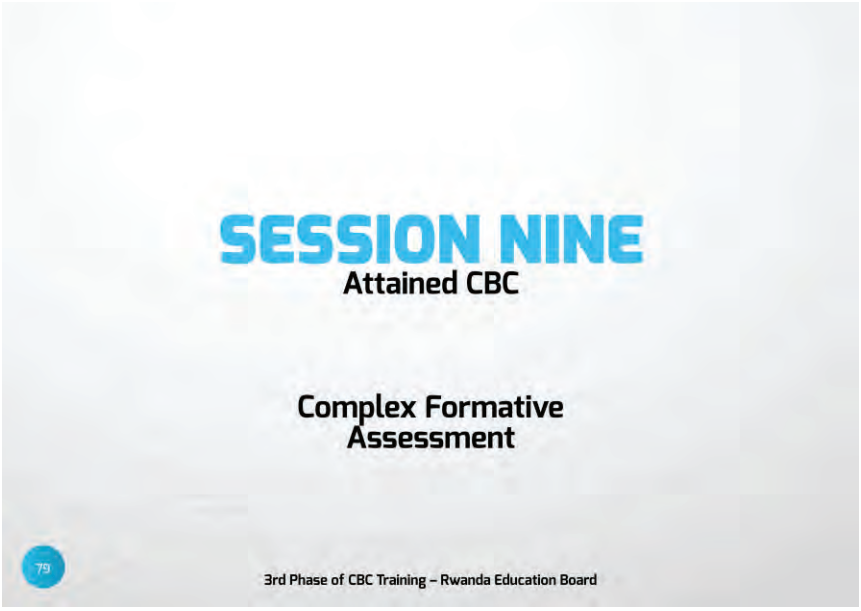
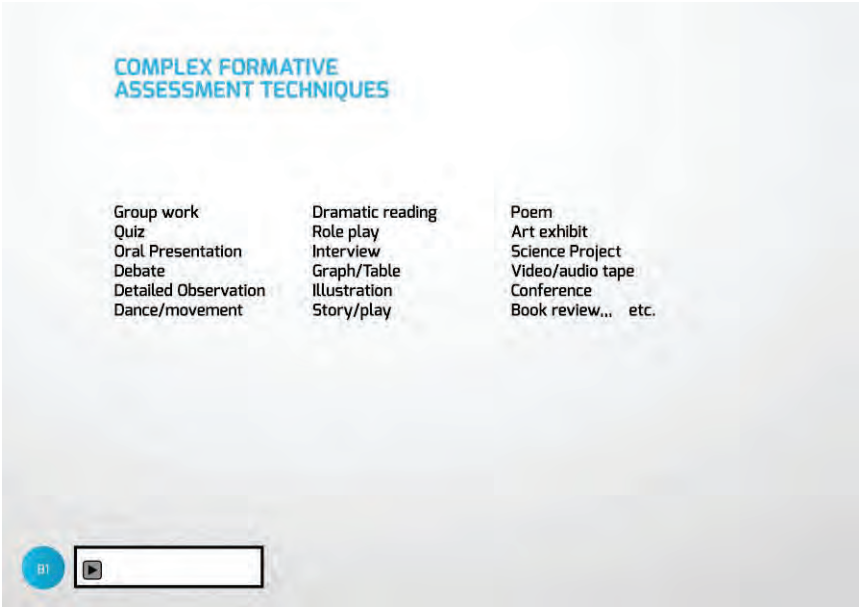
| We will now work together in subject groups to develop closed questions that can be used for the thumbs-up technique. The questions need to have yes or no answers.<br>You have 10 minutes.<br>Share as a whole group for 5 minutes.<br>This is the end of the 8th session. |

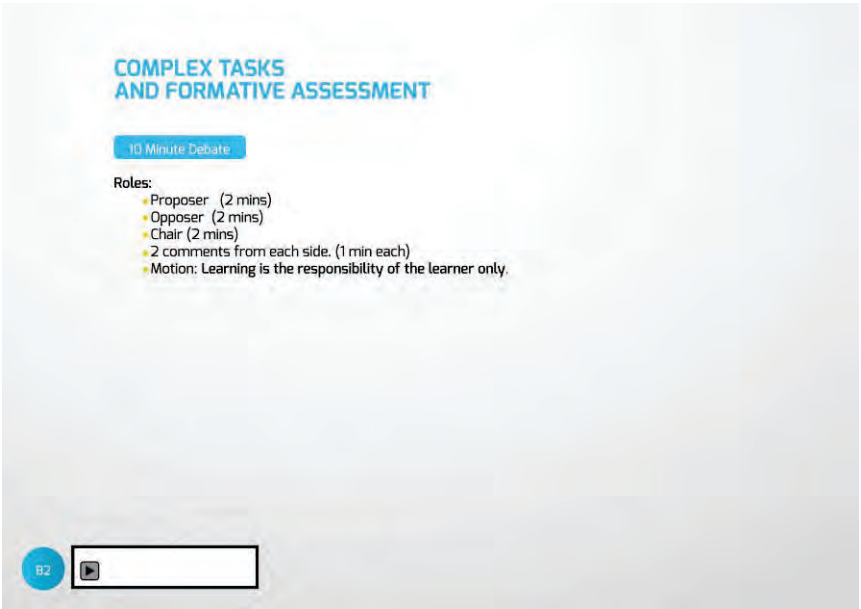
**Session 9: Complex Formative Assessment**



| |
|---|
| Welcome to the 9th session.<br>In this session we are going to focus on complex formative assessment in class.<br>The objectives of this session are to understand the difference between simple and complex assessment techniques, to describe complex formative assessment techniques, to describe the skills assessed in a complex assessment task, and to develop assessment rubrics. |



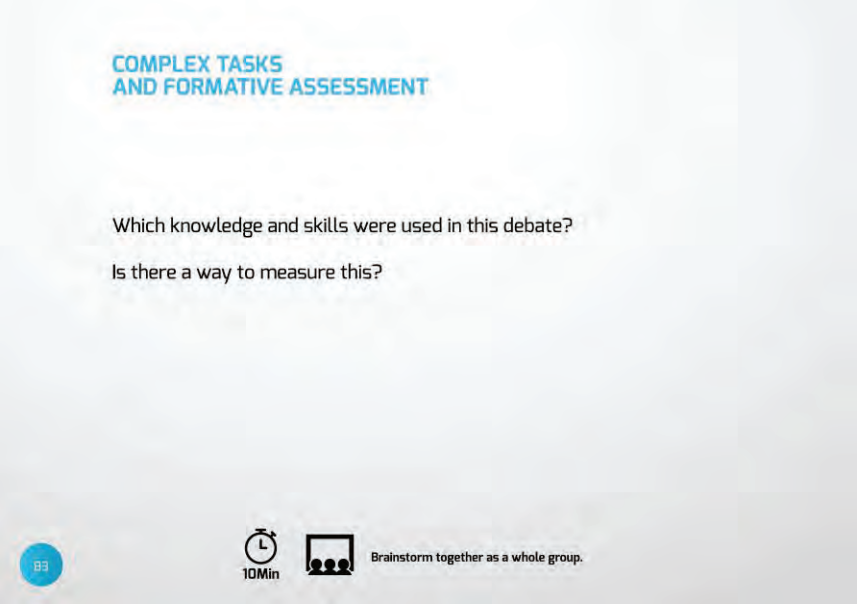

The formative assessment techniques listed here were learnt in the 2nd phase CBC training. They require more skills in order to put them into practice, but they allow the teacher to measure several things at once.
These complex techniques allow teachers to measure how learners can apply their learning, and how they have developed generic competences. But since teachers need to measure several things at once, a clear and fair guideline is required. Rubrics can be used for this to help teachers to clearly measure knowledge and skills.




We are going to organize a 10 minute debate as an example of a complex assessment task.
Assign these roles to 7 participants. Each participant will talk for the times shown.
The Proposer has 2 minutes to talk. The Opposer has 2 minutes to talk. The Chair will have 2 minutes to talk.
Then 4 participants will have 1 minute each for comments.

Supplementary Information

If you think that the participants are not very familiar with debate, you may do another complex assessment task such as presentation and role play.

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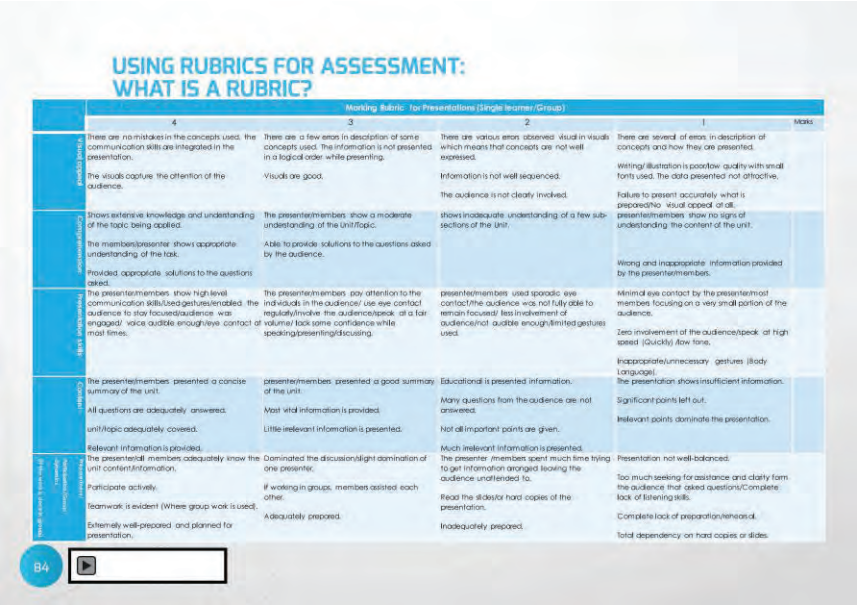
| Brainstorm together as a whole group, which skills did the participants in this debate use?<br>How could we measure these skills?<br>You have 10 minutes. |




| |
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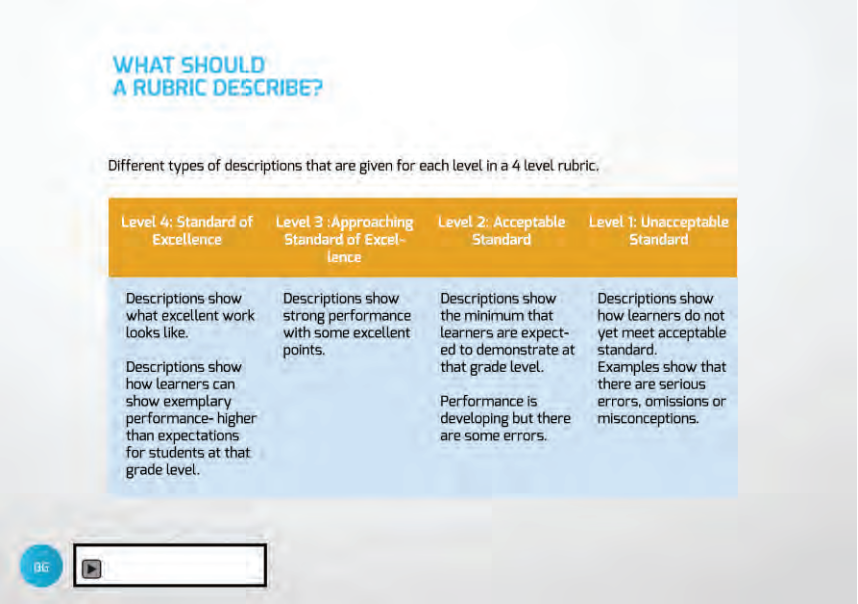
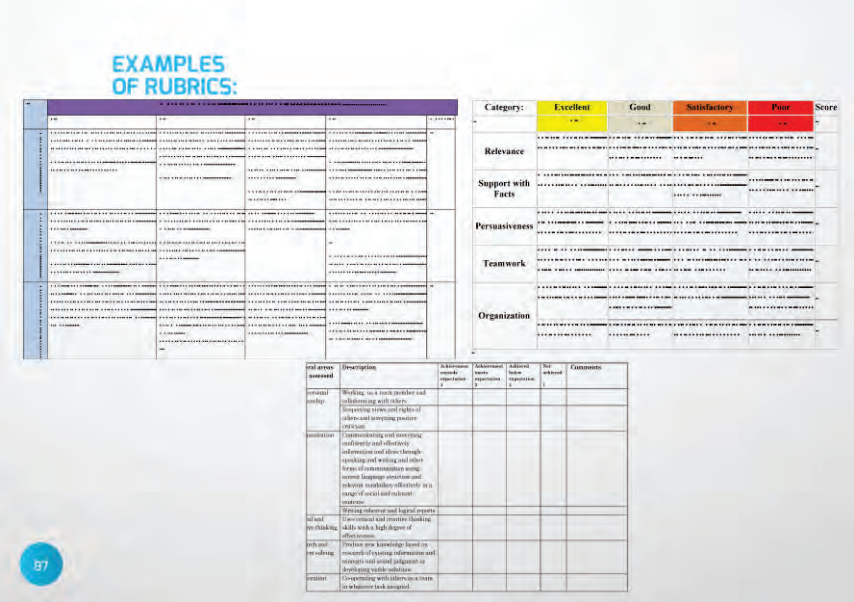
| We can use Rubrics to assess using more complex forms of formative assessment such as presentations, debates or drama, and to collect evidence of learning.<br>Several different criteria can be assessed during the same activity.<br>Rubrics describe stages in the development of knowledge, understanding and skills. The best rubrics have no more than five descriptive levels. |

When developing a rubric, we can ask ourselves 4 questions:
1. What are the specific learning objectives for this task?
2. What does excellent performance look like? How will excellent performance be different from other levels?
3. What does performance in other levels look like?
4. Is each description measurably different from the others? Are the different levels clear and understandable?

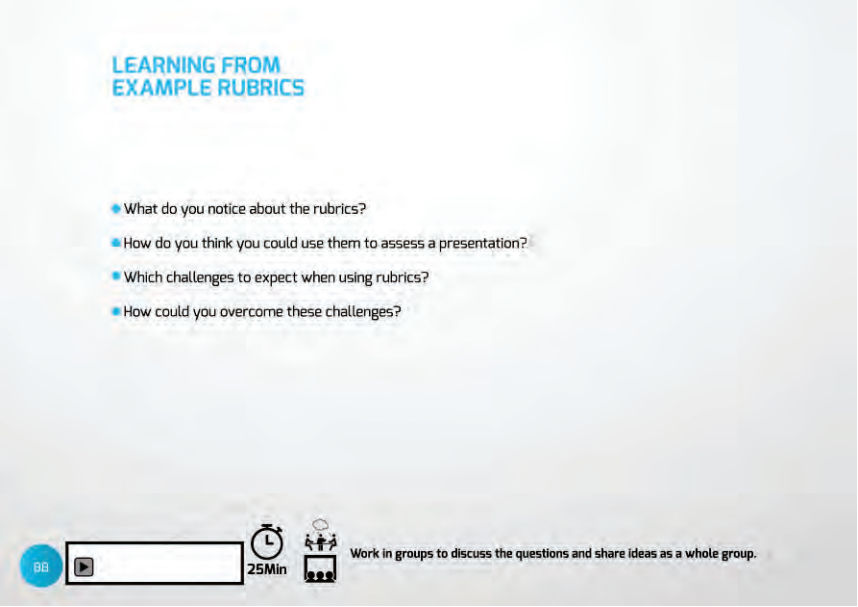



This table shows the different types of descriptions that are given for each level in a 4 level rubric.

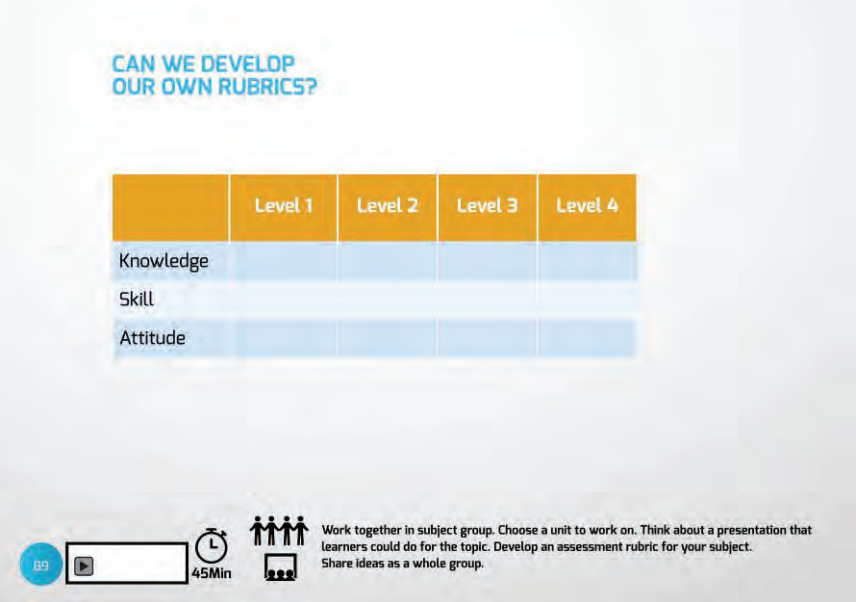



Now we are going to look at different examples of Rubrics in order to think about how we can create our own.

Distribute three Rubric examples to each group (Appendix 5)




Look at the three example Rubrics. Work in groups to discuss the questions.
You have 15 minutes.
When you have finished your discussion, share ideas with the whole group for 20 minutes.




| |
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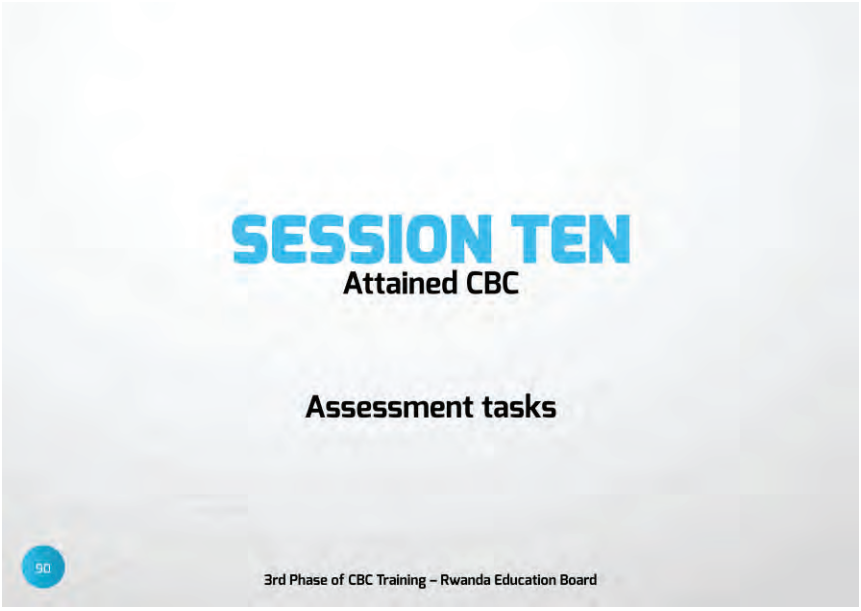
| Work together in subject groups. Choose a unit to work on. Think about a presentation that learners could do for the topic.<br>Develop an assessment rubric for your subject. You have 30 minutes.<br>Share ideas together as a whole group for 15 minutes.<br>This is the end of the 9th session. |

**Session 10: Assessment Tasks**



| |
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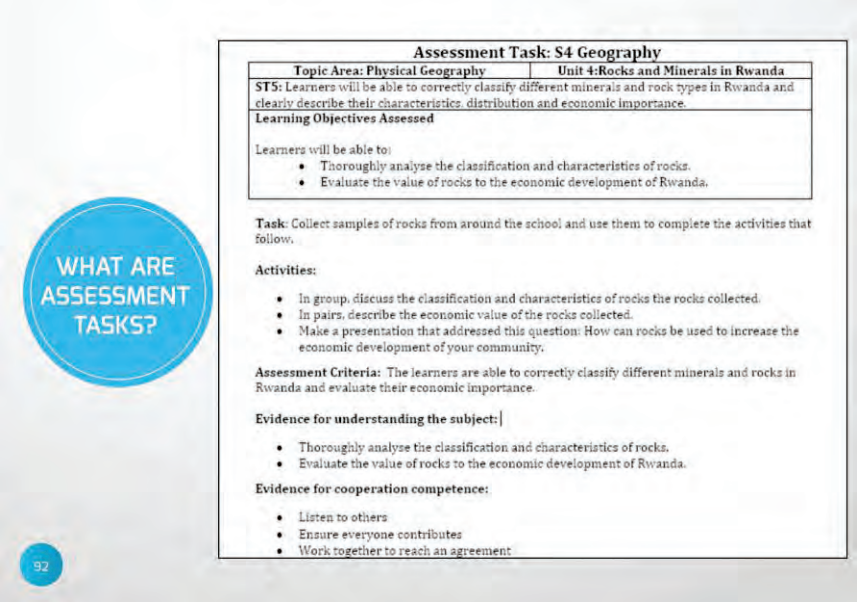
| Welcome to the 10th session.<br>The objectives of this session are to understand the purpose and use of assessment tasks and to understand how to use the SMART checklist to develop assessment tasks. |



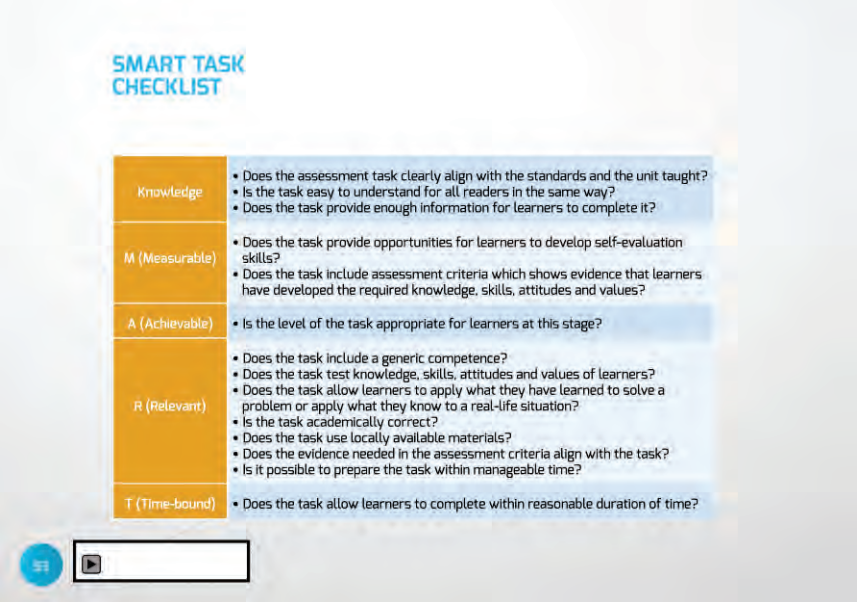

As part of the CBC, teachers are expected to develop SMART assessment tasks.
SMART Assessment tasks are used as a type of formative assessment to assess how learners are able to apply their knowledge and skills in a different context from how they were taught. They are based on the National Examination (Assessment) Standards and feature a generic competence. Tasks can be practical or written, but they must test what learners have learned.
Teachers should develop assessment tasks at least three times per term or they can be developed at the end of each unit.

Supplementary Information

There are two kinds of tasks: one which only tests part of the standard, and the other one which tests the whole standard.

Tasks which only test part of the standard can be used as formative assessment by a teacher to know what he/she must teach next to enable learners to achieve the standard. These kinds of tasks should also include the specific learning objectives which are being assessed because they only refer to a smaller part of the standard.

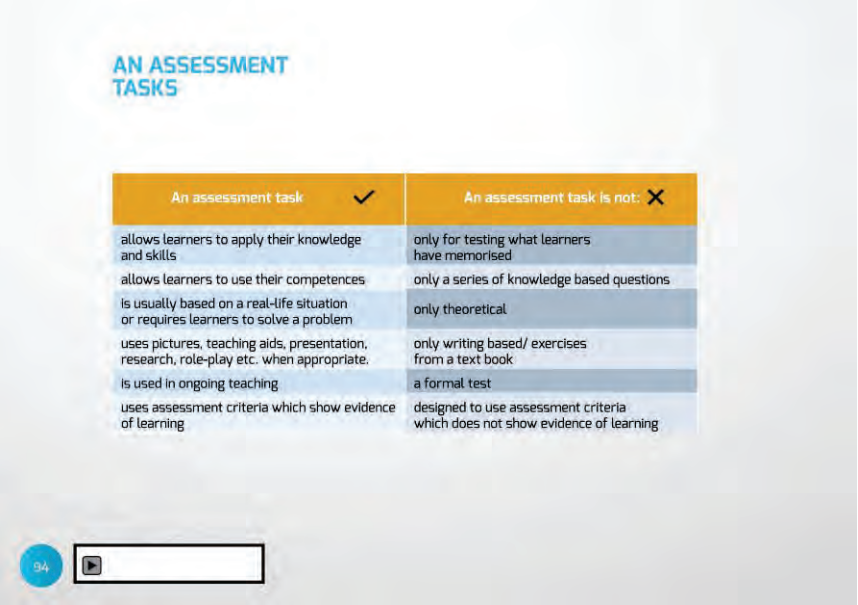
The second kind of task tests the standard as a whole. This can be seen as a kind of summative assessment. These tasks include activities which test all of the learning that has taken place over the unit and checks whether the standard as a whole has been achieved.



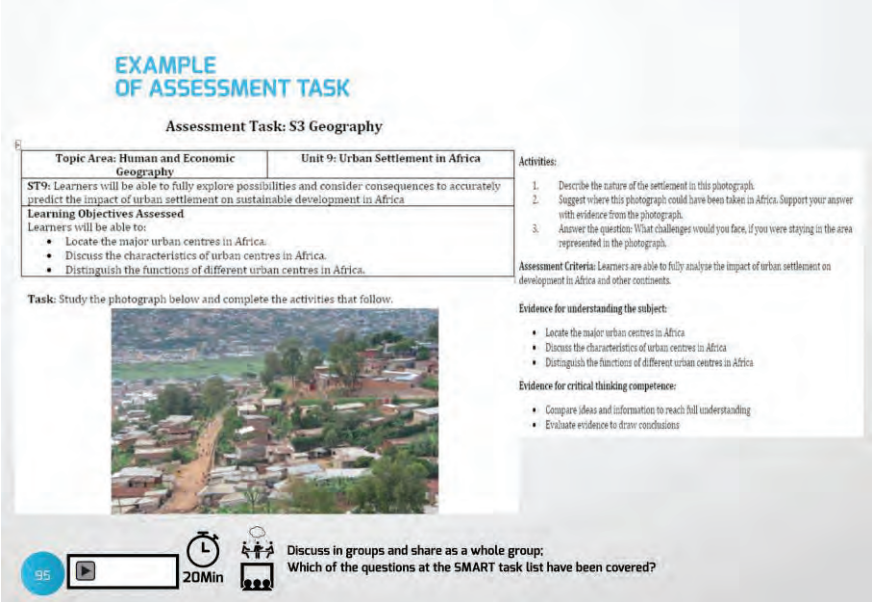

Attention!
The SMART checklist should start with an S (Specific). Trainers should correct it during facilitation.

Distribute SMART task checklist to each group (Appendix 6)

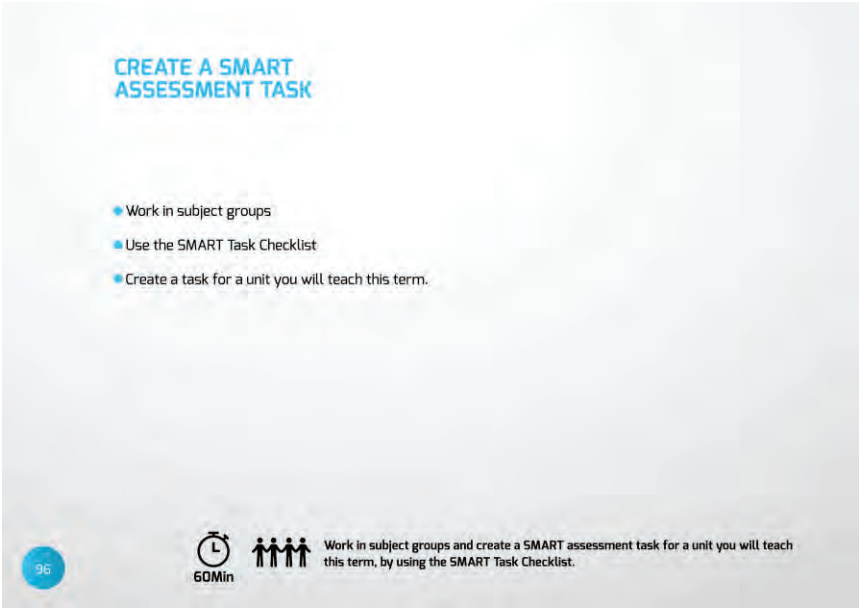
To help us develop assessment tasks, we should check that they are SMART; that is, Specific, Measurable, Achievable, Relevant and Time bound.
The questions in this chart help us consider whether or not a task we are developing is SMART. It is not necessary to include every point from this chart, but one from each section will make sure that the task is of good quality.




Sometimes teachers can design tasks that are a formal test, or that are only based on exercises from the text book, but this is not what a task should be. The table shows what an assessment task is, and what it is not.




| |
|---|
| This is an example of a good assessment task. Look at this assessment task and look at the SMART Task checklist.<br>Work in groups to discuss: Which of the questions have been covered? You have 10 minutes.<br>Share your comments and ideas for another 10 minutes. |




| |
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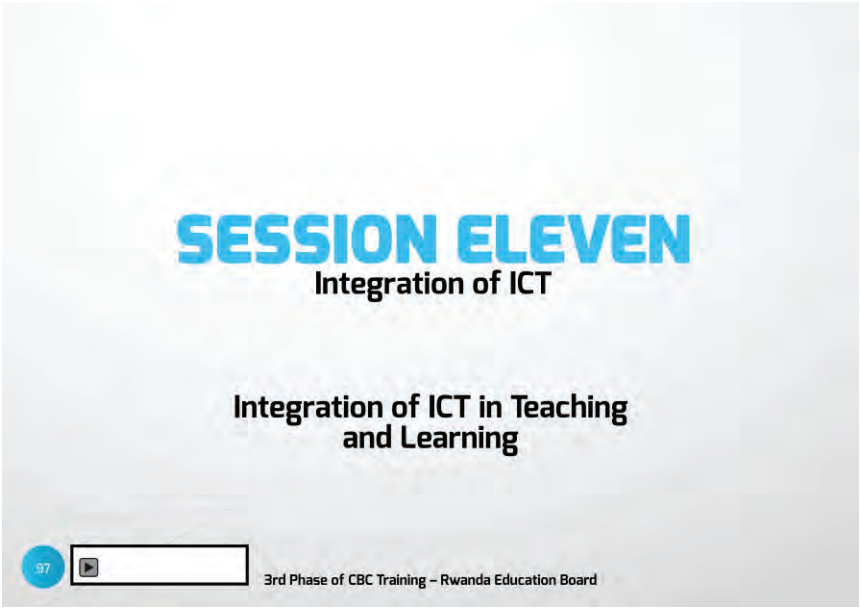
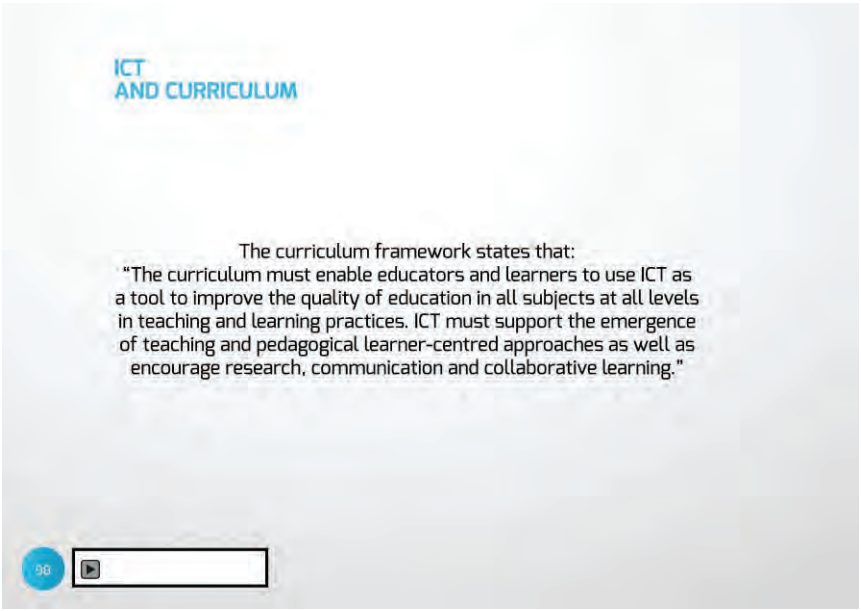
| Now, let us work in subject groups and create a SMART assessment task for a unit you will teach this term, by using the SMART Task Checklist.<br>You have 60 minutes.<br>This is the end of the 10th session. |

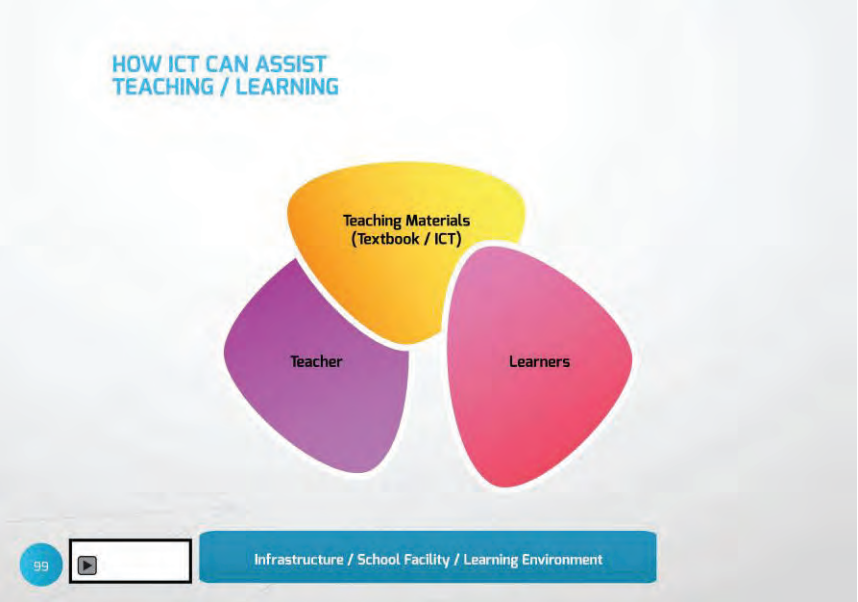
**Session 11: Integration of ICT in Teaching and Learning**



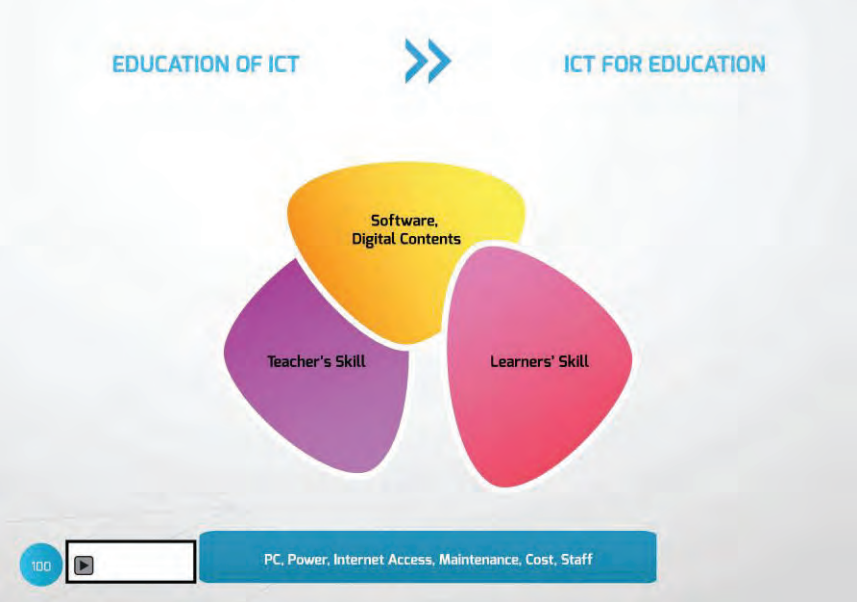

Welcome to 11th session of the CBC Training.
From this session, we will talk about ICT use in our schools.
We are aware that effective use of ICT at school can assist a lot in various ways, as we have already learnt about this topic during Phase 1 and Phase 2 of the CBC training.
Head teachers can be assisted by ICT to improve school management, such as precise and effective recording, keeping of school accounts, learners' academic records, smooth communication with SEOs, and so on.



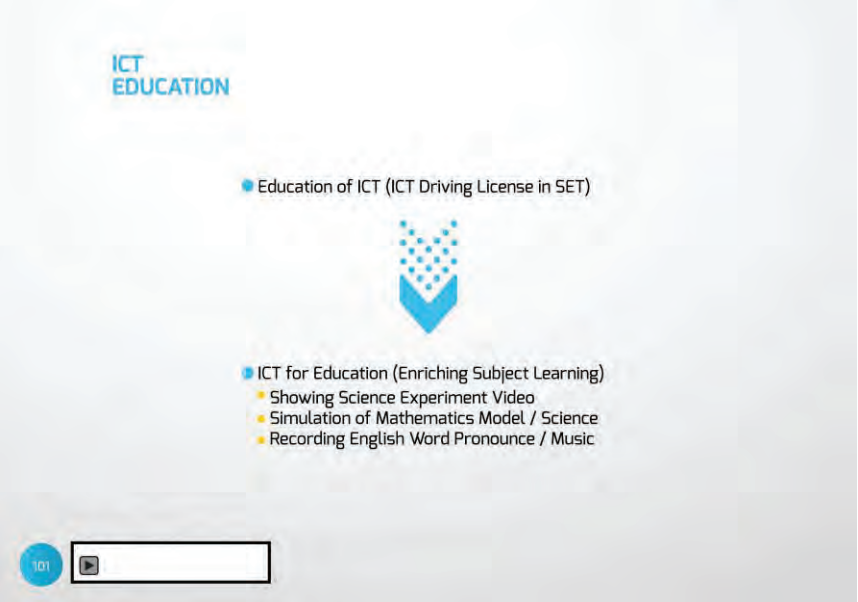

It is stated in the curriculum framework that: "*The curriculum must enable educators and learners to use ICT as a tool to improve the quality of education in all subjects at all levels in teaching and learning practices. ICT must support the emergence of teaching and pedagogical learner-centred approaches as well as encourage research, communication and collaborative learning*."




Teachers can be assisted by ICT to prepare lesson plan, showing useful teaching aids online.
Even without internet some useful teaching materials can assist teachers to deliver quality lessons in the classroom.
Learners can also enjoy learning online, because digital teaching content can give them clear image of science concepts with animations and sounds. It can also enable learners to study whatever they want, at anytime, anywhere, so long as ICT is serving well for them. Can we rephrase? Do you mean internet? Do you mean devices?
ICT is just one of the useful teaching materials which can improve interaction among teacher and learners, and enhance delivery of quality CBC lessons. Of course, teachers can deliver lessons without textbooks, or without using ICT, but these effective teaching materials can assist teachers to deliver the curriculum effectively and assist learners to understand what is being explained by teacher.
Yes, those wonderful technologies are ready to benefit us, however, ICT infrastructure in our schools has still some challenges.




Let us ask ourselves.
Do we have enough computers for teachers? For students? For administration officers?
Do they know how to operate computers in the proper manner?
Are computers installed with relevant software? Are both hardware and software well maintained regularly?
Are computers connected to internet? Protected from viruses?
Is there anybody who can take care of all those technical issues in your school? Or do you outsource?
There are real issues and challenges when we start using ICT in our school.
According to a baseline survey the progress of ICT use in our schools varies from school to school. A questionnaire for secondary school students of some schools reveals that more than half of students use computer at school at least once a week.
So, we can say, learners' access to ICT has been well enhanced.
Teachers and learners have started using PCs, making documents like students list, browsing websites, viewing a digital dictionary, using SNS such as facebook, WhatsApp, and so on. In short, teachers and students have started learning how to operate PC.
However, using ICT is not our goal. Our goal should be delivery of quality CBC, then our focus should be quality learning facilitated by teaching materials including ICT.
Of course, I am not saying "Education of ICT" is not useful, but we also need to start fully utilize ICT to enrich subject learning.
Let ICT assist teachers to teach mathematics, English, Kinyarwanda or any subjects for students.
Let ICT help learners to learn those subjects in a fun way.
Let ICT deliver better education, as we are learning how to use ICT.

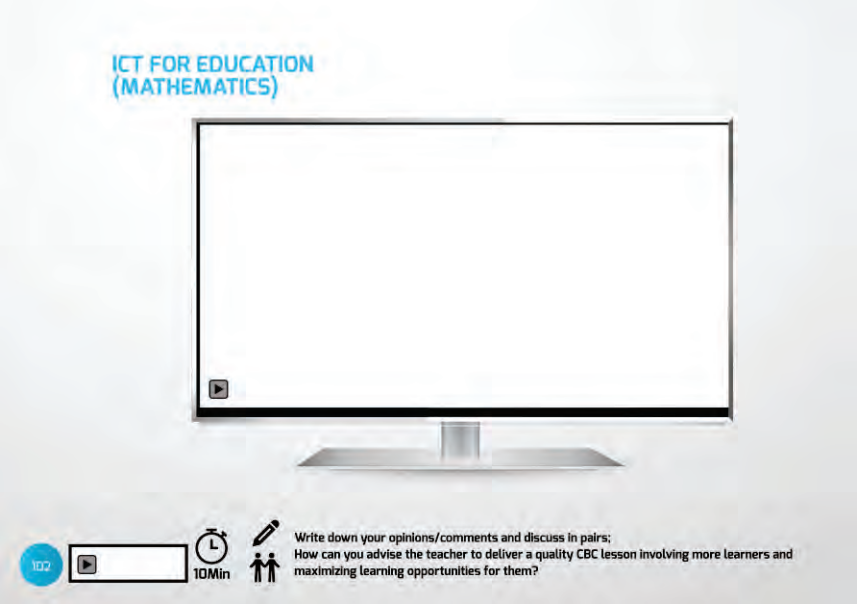



But as I mentioned earlier, ICT, as effective and innovative teaching material, has great potential to enrich subject education, such as English, Kinyarwanda, Mathematics, Science, Social Study, Music, Physical Education and others.

For example, we can show a science experiment digitally, available online. Of course the best practice is to give learners the opportunity to do experiments by themselves, but sometimes, due to lack of school facilities it may not be possible. Some types of science experiments may be dangerous but important. The Teacher explains that Hydrogen is very explosive, so we need to keep it away from flames. But such explanations, without showing actual experiments, are not convincing to learners. You can find a video clip online easily. Lab simulations which are interactive give opportunities to students to practice in virtual labs in exactly the same way as they shouldpractice in real labs.

Again, ICT could assist us well, as an effective teaching aid for learning difficult concepts of mathematics, or science. These concepts are important but abstract, so learners may require effective assistance. ICT can allow teachers to teach with confidence, and learners to learn with joy.

ICT can assist us to improve English speaking and listening skills. We may record learners' pronunciation of English words and compare them with the same English words recorded by a native speaker, for example.




Participants copy an assessment sheet in their notebooks (Appendix 1)

Now, let us watch a video clip and assess the lesson.

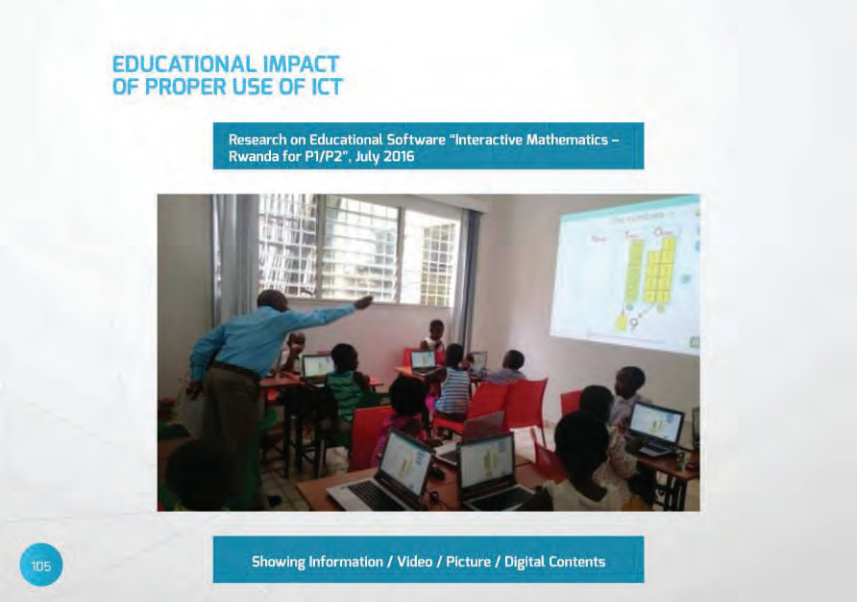
VIDEO

How was that? Did he perform well?
Then, please write down your assessment on the assessment sheet, with your observations/comments/ and reasons why you thought that.
I will give you 3 minutes. Just write down your own opinion without consulting others.
If we have some more time remaining, let us have a pair discussion – exchange your notebook with your colleague, and discuss how you can advise the teacher to deliver a quality CBC lesson involving more learners and maximizing learning opportunities for them.

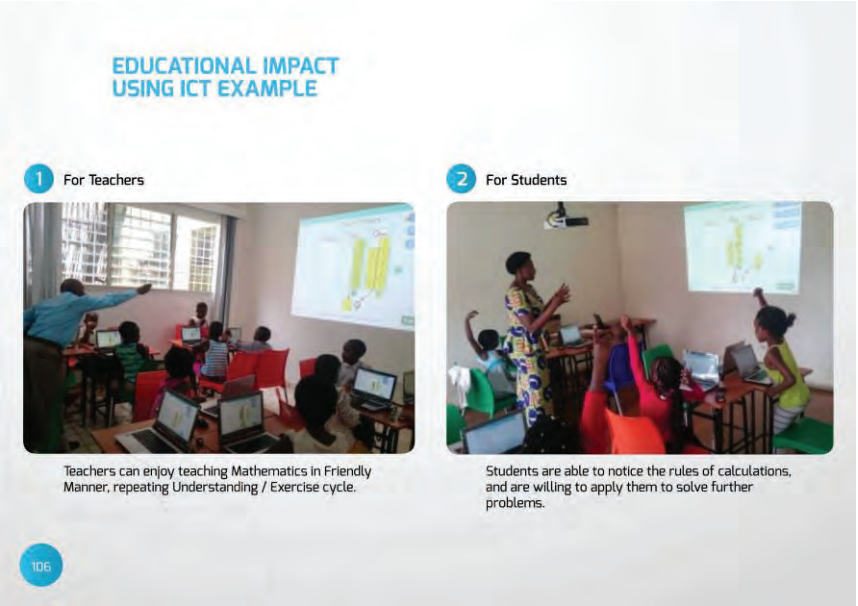
Now, let us remember once again how a teacher can utilize ICT for better lesson delivery.
1. When you prepare/plan a lesson, you may find relevant teaching materials like videos or pictures to explain the topics effectively. If you can show this digital content in your classroom, learners may understand the topic much more easily, in particular when they learn science theories/concepts which are sometimes abstract and difficult to understand. This is the simplest way to use ICT for teaching in your classroom. Seeing is believing.
2. In addition, if you edit the video downloaded from a website but adapted to your lesson plan, or record a science experiment on your video recorder or smart phone, that will assist you to teach specific topics or concept.
3. Then, those digital contents could be safely kept in the PC of the school, and teachers can start sharing those digital teaching materials. That can save a lot of time for teachers preparing the same/similar digital teaching materials, because they don't need to prepare them from scratch. Additionally, this might assist young teachers to learn practical know-how of preparing teaching materials from experienced teachers.
If I summarize the above for us, ICT can assist teachers to prepare lesson plans, serve as teaching materials, and assist teachers to deliver CBC lesson in the classroom.
Of course, ICT infrastructure varies from school to school; some schools are well equipped but some are not.
So, in the next session, let us look at one of examples how we use ICT to enrich learning experiences for our children, depending on how schools are equipped with ICT.

Using ICT does not mean that a teacher will no longer use the blackboard or learners will no longer use textbooks. Online learning materials can be used as well as concrete materials.

It also doesn't mean that every lesson will be taught using ICT. A teacher when planning her/his lesson should identify when to use ICT, which ICT is required in which lesson and how ICT will be used either by the teacher or the learners. ICT is very critical during lesson planning because that is where a teacher identifies which teaching materials she/he will need.
Appropriate pedagogy to integrate the use of ICT in classroom should be developed alongside the provision of computers, internet connectivity and e-resources.




Here, we are sharing some results of the research conducted by one private publisher in Japan assisted by JICA, on the educational impact of the proper use of PCs with educational software.
Within the framework of this research, a survey team conducted a BOOTCAMP, which is a special summer class for P1/P2 students in Kigali.
More than 50 P1-P2 learners attended this 5-day seminar. They learned mathematics intensively for 3 hours every day, to improve basic calculation skills, and mental arithmetic skills in particular.
We may say, the current situation in our schools is much further behind this picture. In this smart classroom, the teacher has a laptop PC, connected to a projector, each of the learners is given a laptop, and the number of learners in the classroom is small.
But in order to capture the educational impact of software and computers, we arranged such ideal situation which is so-called **SMART Classroom.**



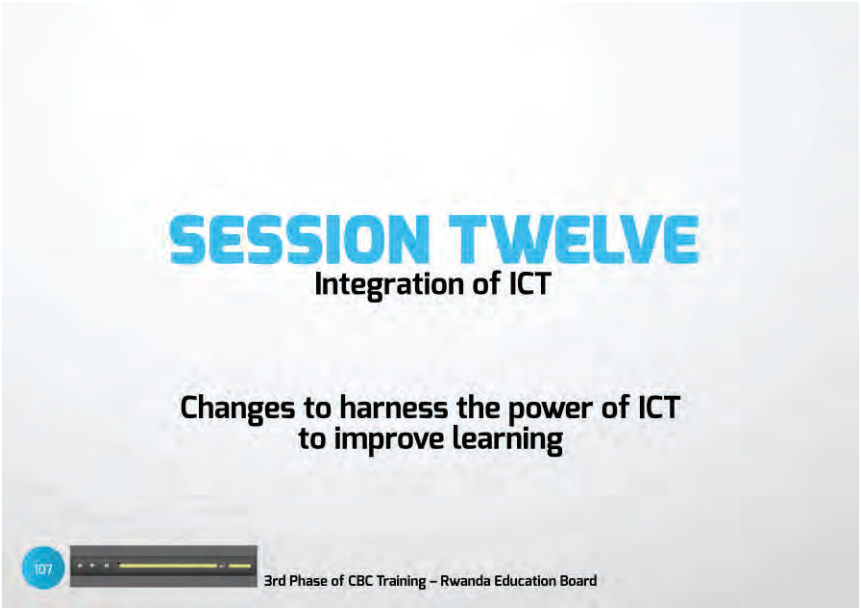

Using software may assist teachers and students.

- Teachers can enjoy teaching mathematics for example in a friendly manner.
- Students are also excited and concentrated throughout the lessons.

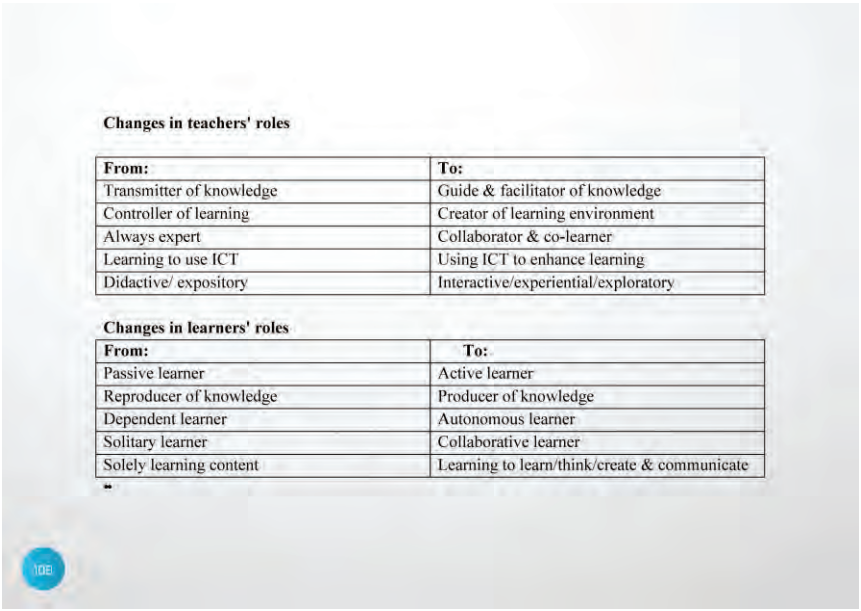
This is the end of session 11.

**Session 12: Changes to harness the power of ICT to improve learning**

This session needs one laptops per group or per participant for a group work.




Welcome to the 12th session.
In this session, let us see the different changes that should happen to harness the power of ICT to improve learning.



**Changes in teachers' roles**

| From: | To: |
|---|---|
| Transmitter of knowledge | Guide & facilitator of knowledge |
| Controller of learning | Creator of learning environment |
| Always expert | Collaborator & co-learner |
| Learning to use ICT | Using ICT to enhance learning |
| Didactive/ expository | Interactive/experiential/exploratory |

**Changes in learners' roles**

| From: | To: |
|---|---|
| Passive learner | Active learner |
| Reproducer of knowledge | Producer of knowledge |
| Dependent learner | Autonomous learner |
| Solitary learner | Collaborative learner |
| Solely learning content | Learning to learn/think/create & communicate |

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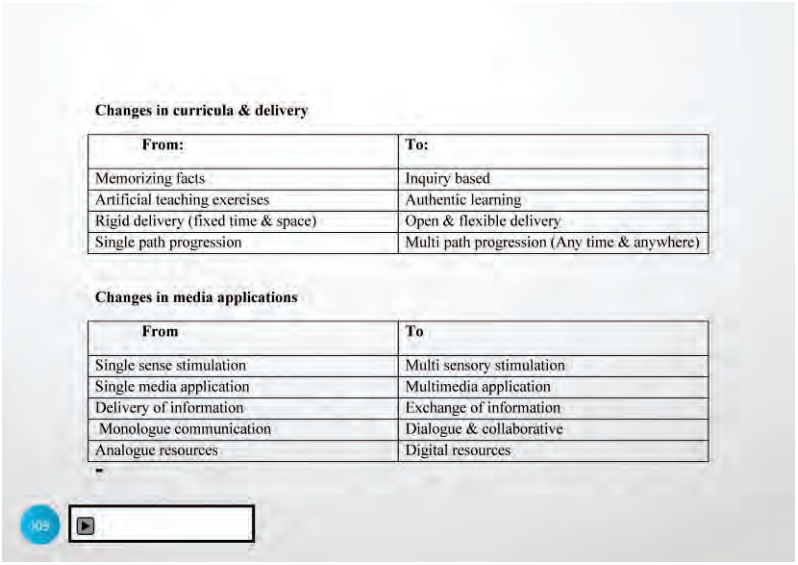
ICT can be used to support change and to support/extend existing teaching practices. ICT brings a lot of positive changes in the teaching and learning process; supporting the development of the 21st century skills and motivating learners to become active.
However, a shift in the role of a teacher using ICT to that of a facilitator does not remove the need for teachers to serve as leaders in the classroom; traditional teacher leadership skills and practices are still important.



**Changes in curricula & delivery**

| From: | To: |
|---|---|
| Memorizing facts | Inquiry based |
| Artificial teaching exercises | Authentic learning |
| Rigid delivery (fixed time & space) | Open & flexible delivery |
| Single path progression | Multi path progression (Any time & anywhere) |

**Changes in media applications**

| From | To |
|---|---|
| Single sense stimulation | Multi sensory stimulation |
| Single media application | Multimedia application |
| Delivery of information | Exchange of information |
| Monologue communication | Dialogue & collaborative |
| Analogue resources | Digital resources |

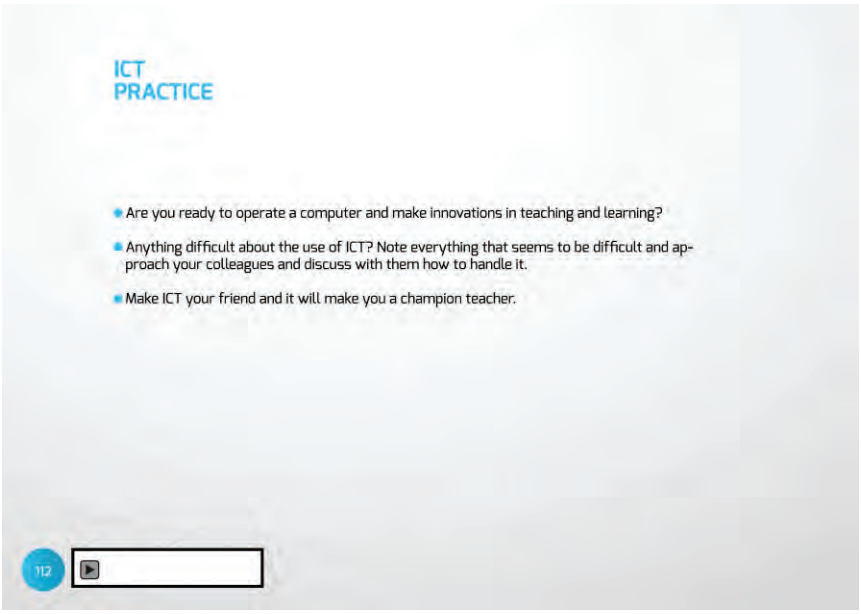
However, teachers must focus on the subject content through exploiting the benefits of ICT and avoiding distraction in presentation**.**
Teachers must see how the technology selected fits into the objective of the lesson, methods of instructions, evaluation, feedback and follow-up initiatives.
Training teachers in ICT will increase the teaching/learning resource base and improve education delivery at all levels. A teacher who does not understand the purpose of technology integration, or how it could be applied, is less likely to be successful in a technology-based learning environment.

Now, create groups according to your teaching subjects, select a group representative, then using a computer, develop a lesson plan on your subject. Choose a level and a unit. Create the content of your lesson then get ready to present it for 10 minutes, focusing on the part of use of ICT.
You will receive feedback from other groups to improve your teaching using ICT for 5 minutes.

Share a soft copy of lesson plan format with each participant or group (Appendix 2). Participants should be requested to bring their laptops in advance.

Supplementary Information

Here, the participants are expected to develop a lesson plan for 30 minutes. Then, one group has 10 minutes to present and 5 minutes to get feedback. Up to three groups can do this, but you can adjust the time according to schedule.




All of us are not familiar with use of ICT in teaching and learning, but it is something crucial that you have to embrace because technology is a vital element in today's digital and internet society. It enables access to knowledge, opportunities and collaboration, surpassing most geographical limitations. As you got familiar with a smart phone, you have to be more curious about operating computers, and always try to be an innovative person by using ICT in your everyday activities (i.e. teaching and learning).

All teachers have to be computer literate to implement the CBC well.
There is so much useful educational software that is available offline that can help a teacher to enrich a lesson, engaging all students enabling them to understand deeply. Classroom management is improved when a lesson is very relevant to the learners. If students are engaged or occupied, they will not disturb the lesson and classroom management will be maintained itself.

The teacher has to be familiar with the use of educational internet and different types of search engine like kiddle.com, google.com, bing.com, yahoo.com, ask.com, aol.com, etc.
Among those search engines you choose what is relevant for you, depending on the content you are searching.
This is the end of session 12.

**Special Session: Overview on Teacher Management Information System**

This session is about registration procedure on Teacher Management Information System (TMIS). Those who have not registered should refer to this session individuary.

## 2. Guideline of Assessment Task and Question Development (Learning and Assessment Standards in Rwanda)

### 2.1. What Are National Standards and How Are They Used in Assessment?

National Learning and Assessment Standards define what every learner in the country is expected to know and be able to do. Rwanda has adopted National Learning and Assessment Standards as a basis for the assessment of basic and generic competences across the curriculum. They have been developed from the curriculum and they combine subject knowledge and skills with competences.

Standards are used for:

- Providing common criteria to assess learners' progress against.
- Clarifying learning expectations for pupils in schools. This gives learners and parents a more precise indicator of learning expectations.
- Aligning expectations with the demands of the rapidly changing economic, social and political world order to ensure that learners are prepared to participate in the contemporary world.
- Guiding and developing teaching. Clarifying what learners should know and be able to do helps to provide a clear focus for teaching practices.
- Fostering commitments to equity. Standards define the same expectations for learners independent of their level of skill, social origin, culture, race or gender.
- Identifying learners and schools in need of support.

| Topic Area | Unit Title + number | No. of Periods | Subject Content | Key Unit Competence | Learning and Assessment Standard<br><br>Learners will be able to: |
|---|---|---|---|---|---|
| ALGEBRA | Unit 1: Sets | 30 | • Sets<br>• Venn diagrams<br>• Relations | To be able to use sets, Venn diagrams, and relations to represent situations and solve problems. | **ST1:** Correctly define, explain and use sets, Venn diagrams, and relations to represent situations and solve problems. |
| | Unit 2: Sets of Numbers | 36 | • Properties of sets of numbers<br>• Subsets of numbers<br>• Set and number relationship | To be able to use operations to explore properties of sets of numbers and their relationships. | **ST2:** Correctly identify sets of numbers (natural, integer, rational, and real) and the relationship between them; accurately apply/determine the operation properties of sets of numbers. |
| | Unit 3: Linear Functions, Equations, and Inequalities | 36 | • Linear functions<br>• Equations with one unknown<br>• Inequalities with one unknown | To be able to represent and interpret graphs of linear functions and apply them in real life situations; solve linear equations and inequalities; appreciate the importance of checking solutions; and represent the solution. | **ST3:** Accurately represent and interpret graphs of linear functions and apply them to real life situations; correctly solve linear equations and inequalities with one unknown; appreciate the importance of checking the solution, and representing the solution on a number line. |
| | Total number of periods for topic area | 102 | Notes: | | |
| | Total number of weeks for topic area | 17 | | | |

Figure 4 An Example of Assessment Standards (Mathematics)

Standards are for use in the classroom, examinations and in providing data for monitoring national performance. They offer teachers the chance to make a big difference to their learners, because the structured approach to assessment supports the new curriculum; the Learning and Assessment Standards provide the link between the curriculum and the different forms of assessment. They are used in teachers' day-to-day assessments, in formative assessments during the teaching of topics and units, and in summative assessments by teachers at the end of a unit.

These Standards combine subject knowledge and skills with 21st century competences.
The Learning and Assessment Standards are the foundation for

- teacher assessment in the classroom
- teacher and school assessment at the end of terms
- district led assessment at the end of years when there is no national examination
- national assessments and examinations at the end of each phase of schooling

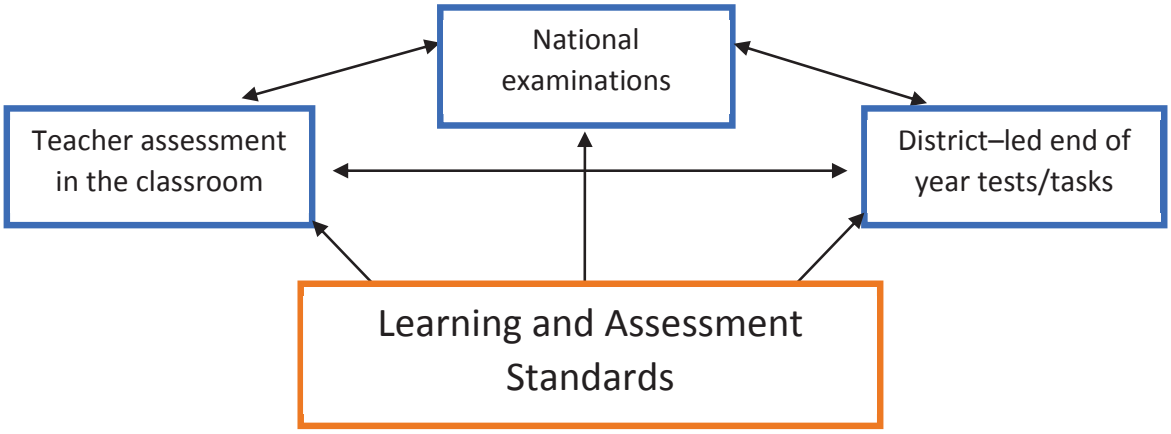



Figure 5 Learning and Assessment Standards

Instructional Objectives, Syllabus Objectives, Key Unit Competences, and Standards fit together as shown in the figure below.

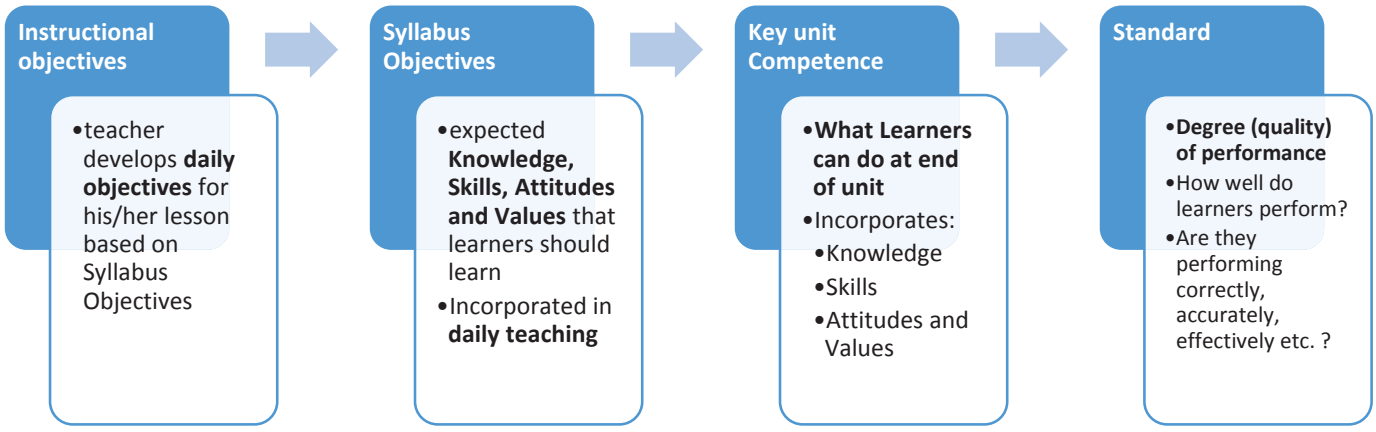



Figure 6 Relationship of Instructional Objectives, Syllabus Objectives, Key Unit Competences, and Standards

## 2.2. Designing assessment tasks

When a teacher assesses, he/she should focus on checking if learners are applying their knowledge and their ability to find out information from sources, rather than being told the answers and simply remembering them.

When teachers are teaching a sequence of lessons for a unit, they need to devise appropriate tasks that will show how much progress learners are making in relation to the standards.

Assessment tasks must give opportunities for learners to show:

- what they know
- how they apply their learning
- how they use their competences

Teachers will teach all the units in the curriculum but they may find it too much of a burden to attempt to formally assess and record against the Learning and Assessment Standards in every unit for every learner. In that case they should choose, if possible, to make 3 or 4 assessments of the Standards related to the Units for each term.

**Planning and teaching to include the competences and standards**

1. Look at all the units for the term and their Learning and Assessment Standards
2. Plan to assess 3 competences more formally during the term
3. Choose which competences to assess, if there are too many to include all of them
4. Identify the Units and competences to be assessed and plan the tasks which will give evidence of both the subject and the competence
5. In the second half of teaching a topic/unit, build in activities which will give evidence to be assessed against the Standard
6. Give the tasks and assess as many learners as possible either in the lesson or marking written work
7. Record the results
8. Review how well learners have performed the task, and decide if overall they will all succeed in achieving the Standard by the end of the unit
9. Give feedback to learners to help them achieve the Standard with help or independently
10. During the rest of the time teaching the unit, assess any learners for whom there is no assessment, watch for new evidence of progress and revise records accordingly
11. During this planning make sure that the amount of time for this assessment does not take away from teaching time. Remember that doing and recording these assessments can take a long time for a whole class, so plan to keep it simple

Figure 7 Relationship of Instructional Objectives, Syllabus Objectives, Key Unit Competences, and Standards

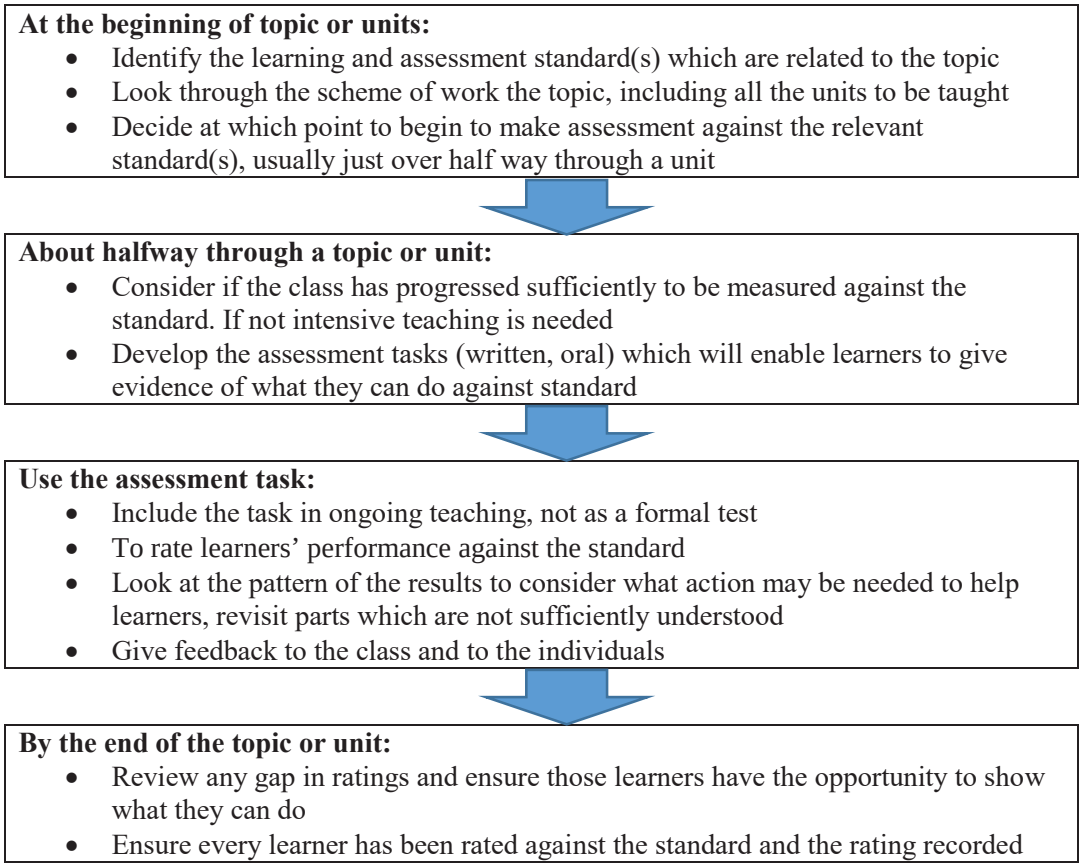



Figure 8 Using Learning and Assessment Standards in Topics and Units

To make designing tasks easier, REB has created mapping documents.
These documents put the Key Unit Competence and Assessment Criteria (from the syllabus) and the Assessment Standards for the unit together in one place. Teachers can use this mapping and the subject syllabus to help them when creating assessment tasks. The assessment mapping does not replace the curriculum or subject syllabus but is intended to be a supporting document which teachers can use to help in their work when planning assessment tasks and questions.

## Assessment Mapping: S1-S6 Mathematics

| S1 | S2 | S3 | S4 | S5 | S6 |
|---|---|---|---|---|---|
| **Unit 1:** Sets<br><br>**KUC:** To be able to use sets, Venn diagrams, and relations to represent situations and solve problems.<br><br>**AC:** Can use sets, Venn diagrams and relations to represent situations and solve problems.<br><br>**ST1:** Learners will be able to correctly define, explain and use sets, Venn diagrams, and relations to represent situations and solve problems. | **Unit 1:** Indices and Surds<br><br>**KUC:** To be able to determine and use properties of indices and surds.<br><br>**AC:** Can use rules of indices and surds to simplify mathematical situation involving indices and surds.<br><br>**ST1:** Learners will be able to accurately apply the rules of indices and surds to simplify mathematical expressions; find the square root using various calculation methods. | **Unit 1:** Problem Sets<br><br>**KUC:** To be able to solve problem sets.<br><br>**AC:** Can solve problem sets.<br><br>**ST1:** Learners will be able to correctly solve problems involving sets and accurately apply mathematical rules. | **Unit 1:** Fundamentals of Trigonometry<br><br>**KUC:** To be able to use trigonometric circle and identities to determine trigonometric ratios and apply them to solve related problems.<br><br>**AC:** Apply trigonometric concepts to solve problems involving triangles and angles.<br><br>**ST1:** Learners will be able to clearly define and accurately show graphically sine, cosine, and tangent; effectively use trigonometry, including the sine and cosine rules, to solve problems involving triangles, on bearing, air navigation, etc. | **Unit 1:** Trigonometric Functions and Equations<br><br>**KUC:** To be able to solve trigonometric equations, inequalities and related problems using trigonometric functions and equations.<br><br>**AC:** Learners are able to apply trigonometry functions, transformation formulas and equations to solve problems related to trigonometry.<br><br>**ST1:** Learners will be able to effectively use trigonometric functions, transformation formulas and equations to solve problems involving trigonometric concepts. | **Unit 1:** Complex Numbers<br><br>**KUC:** To be able to perform operations on complex numbers in different forms and use complex numbers to solve related problems in physics (voltage and current in alternating current), computer science (fractals), trigonometry (Euler's formula to transform trigonometric expressions).<br><br>**AC:** Learners are able to perform operations on complex numbers in different forms and use complex numbers to solve related problems in physics (voltage and current in alternating current), computer science(fractals), trigonometry (Euler's formula to transform trigonometric expressions).<br><br>**ST1:** Learners will be able to accurately apply the |

Figure 9 An Example of Mapping

Teachers should follow the process below in order to design assessment tasks:

1. Use the unit and the Standard to identify the main subject knowledge and skills.
2. Decide to assess the whole standard, or just part of a standard.
3. Identify which aspects of the generic competence can be included, such as creativity, problem solving, or critical thinking. The competences of cooperation or communication or some aspects of the other competences may be better assessed in a practical task than by a written task.
4. It is possible to set tasks for learners to work on individually or for groups of learners to do together. The teacher can observe the groups, as well as assessing the final product of their work.
5. Construct questions/tasks related to the knowledge and skills and the competence being assessed.
6. Identify criteria for judging the learners' work. Include this in the design of the task.

A task should have several activities to assess the standard and to see how learners can apply their learning.

There are two kinds of task; assessment tasks used in a single lesson, and tasks used at the end of a unit (**End of Unit Assessment Tasks)**.

- **Tasks used in single lessons**

Tasks used in lessons are designed to be used as part of the teaching/learning process.
They only cover **part** of the standard for the unit. The teacher may design several other tasks and activities to cover the other parts of the standard. Therefore, because assessment tasks used in a single lesson only cover a part of the standard, it is necessary to include instructional objectives to show which part of the standard is being assessed.

For example, let us look at how the objectives will be included:
The task below only assesses part of the standard: *Learners will be able to clearly describe evidence of continental drift.* In order to clarify which parts of the standard are focused on this task, the instructional objectives have been included.

| **Topic Area: Physical Geography** | **Unit 3: The Origin and Distribution of Continents** |
|---|---|
| **ST5:** *Learners will be able to clearly describe evidence of continental drift* and its effects on the evolution of physical features. | |
| **Learning Objectives Assessed**<br>Learners will be able to:<br>• Define the term continental drift.<br>• Identify evidence of continental drift. | |

(NB. only part of the task is shown here)

- **End of Unit Assessment Tasks**

End of Unit Assessment Tasks are designed to measure whether learners have reached the expected standard by the **end** of the unit. In order to reach this standard, learners must have developed the Key Unit Competence.
End of Unit Assessment Tasks are therefore more complex. They are designed to test various skills, knowledge attitudes and values from the start of a unit up to the end of the unit.
These tasks must include activities that measure learners' ability to use their new knowledge and skills and attitudes to solve a problem. The learners must integrate everything that they have learned within the unit to solve the problem. These tasks do not require instructional objectives because they are assessing the standard as a whole.
*Note: These tasks had previously been called* integration situations *but they have now been modified to become End of Unit Assessment Tasks.*

For example, this task does not include instructional objectives:

| **Topic Area: Physical Geography** | **Unit 3: The Origin and Distribution of Continents** |
|---|---|
| **ST5:** Learners will be able to clearly describe evidence of continental drift and its effects on the evolution of physical features. | |

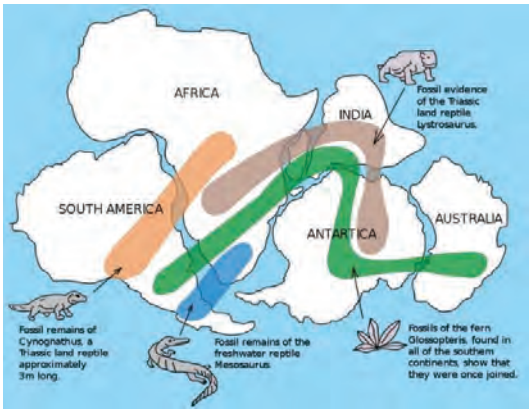
(NB. only part of the task is shown here)

◆ **Example of a task to be used in a single lesson:**

**Assessment Task: S6 Geography**

| **Topic Area: Physical Geography** | **Unit 3: The Origin and Distribution of Continents** |
|---|---|
| **ST5:** Learners will be able to clearly describe evidence of continental drift and its effects on the evolution of physical features. | |
| **Learning Objectives Assessed**<br>Learners will be able to:<br>• Define the term continental drift.<br>• Identify evidence of continental drift.<br>• Identify the effects of continental drift on the evolution of physical features. | |

**Task:** Study the photographs and use the textbooks provided to complete the activities that follow.




**A**

**B**

**Activities:**

1. Explain the meaning of continental drift.
2. Use the photographs A and B to describe the distribution of continents.
3. Describe evidence of continental drift.
4. Examine the effects of continental drift on the evolution of physical features.

**Assessment criteria:** Learners are able to correctly explain the origin and distribution of the continent

**Evidence for understanding the subject:**

- Define the term continental drift.
- Identify evidence of continental drift.
- Identify the effects of continental drift on the evolution of physical features.

**Evidence for communication competence:**

- Convey ideas confidently through writing
- Organize and structure sentences correctly to express meaning
- Use appropriate vocabulary

◆ **Example of End of Unit Task:**

**End of Unit Assessment Task: S3 Geography**

| **Topic Area: Physical Geography** | **Unit 7: Environmental Conservation** |
|---|---|
| **ST11:** To be able to evaluate the methods of environmental conservation | |
| **Learning Objectives Assessed**<br>Learners will be able to:<br>• Categorise environmental resources.<br>• Explain effects of environmental degradation and suggest conservation measures. | |

**Task: Read the Case Study below and complete the activities that follow.**

**Case Study:**

The local leaders in Gakenke District in Northern Province are very concerned with the increasing occurrence of landslides, deep gullies that are now common in the area, flooding in valleys and destruction of crops and property. The land officers in the district are worried about the nature of land that is made up of unconsolidated (loose) soils. The district has had a number of intervention measures that include: afforestation, reforestation, and promoting better methods of farming. However, the problem is still worrying. The relief or nature of the landscape is described by steep slopes associated with scars left behind by numerous landslides during the rainy season. While other parts of the district have gentle sloping areas that are appreciated for having stable soil conditions. Local leaders have embarked on an environmental conservation campaign at the grass root level or in all villages. This has called for the training of the village representatives on the importance of environmental conservation.
The community leaders of your village (Umudugudu) have nominated or selected you to be part of the trainers at the district level.

1. Suppose the district land officer asks you to address the trainees:
   a) Prepare how practically you would address the problem of landslides, severe soil erosion and flooding in your village.
   b) Address one of the participants who asks the following question: "I planted trees but recently the whole land was affected by land slide."
2. In spite of the hard work and serious land conservation measures the district has used, still landslides are common as per the case study above.
   a) Referring to the short story entitled "Save our mother Earth" how would you advise the land office of Gakenke District on how practically it is possible to solve the environmental concerns in the district.
   b) Show how you would creatively use local available resources to assist local farmers to conserve natural resources.

**Evidence for understanding the subject:**

- Categorise environmental resources.
- Explain effects of environmental degradation and suggest conservation measures.

**Evidence for communication competence:**

- Adapt to others' ideas
- Adapt to different situations
- Ensure everyone contributes

To complete the above stated task, it requires integration of knowledge, skills, attitudes and values taught throughout the previous 3 lessons as well as drawing on previously gained competences from S2 units; 8, 10, 15, and 16 prior to S3.

## 2.3. Assessing Generic Competences

The checklists below suggest what teachers can look for when assessing generic competences. They also contain suggestions of activities which help to develop those competences. A teacher can use this information to help design assessment tasks relating to the Assessment Standards to check if a competence has been developed.

| **Cooperation Checklist** | |
|---|---|
| This Competence is primarily concerned with **group work and collaboration** in groups of different sizes. It focuses on the **talk and actions** which enable group work to succeed and show more learning than could be achieved individually.<br><br>Bigger groups need a structure to work well – roles such as chair/leader, secretary, practical worker, can be designated by the teacher and, increasingly, decided by learners. | |
| **Types of Activities**<br>• Use pairs, small and large groups<br>• Require joint action, sharing ideas and working towards a common goal.<br>• Avoid tasks where one person can dominate, or where a very able learner can fulfil the task immediately.<br>• Cannot be included in a written test. | **Types of contributions which teachers can see and hear**<br>• Suggesting ideas<br>• Listening to others<br>• Ensuring everyone contributes<br>• Building on others' contributions<br>• Being positive about others' contributions<br>• Helping to reach agreement<br>• Adapting to others' ideas<br>• Adapting to different situations |

| **Communication (oral) Checklist** | |
|---|---|
| This competence is primarily concerned with **speaking and listening**, particularly in **more formal situations** such as speaking to all the class, debating, reporting a group discussion | |
| **Types of Activities**<br>**Informal:**<br>• Use pairs, small and large groups<br>• Require discussion between learners, exchanging ideas and negotiating ways forward<br>**Formal:**<br>• Debates, presentations, interviews. Tasks should require learners to speak for longer and present to whole classes and bigger groups<br>• Include different audiences (classes, teachers, parents) to ensure learners to adjust their language and style to ensure good communication and show they can engage different audiences for different purposes<br>• Cannot be included in a written test | **Features of speaking and listening which teachers can see and hear**<br>• Speaking audibly and clearly<br>• Looking at listeners<br>• Making sense<br>• Expressing good ideas<br>• Using good English<br>• Well chosen vocabulary<br>• Engaging listeners<br>• Adjusting in the light of others' contributions<br>• Varying expression, tone, volume<br>• Using gesture, body language, facial expressions well<br>• Responding thoughtfully to questions<br>• Justifying ideas |

| **Creativity and innovation Checklist** | |
|---|---|
| In showing creativity **learners think for themselves** rather than simply seeking the right answer from the teacher. Learners **adapt** the ways they **solve problems** to reach the best outcomes. | |
| **Types of Activities**<br>• Allow for a range of correct answers where possible<br>• Different ways to reach a product, outcome, solution or design.<br>• Encourage imagination and initiative | **Types of contributions which teachers can see or hear**<br>• Sugg**esting imaginative ideas for consideration**<br>• Making connections between different information and ideas<br>• Showing initiative<br>• Expressing emotions and feelings in words, movement, visually, with artistic intention<br>• Building on others' ideas<br>• Making something new<br>• Thinking of different solutions |

| **Research and Problem Solving Checklist** | |
|---|---|
| ***Research:***<br>Independent learners find out things for themselves. When investigating and looking for evidence for questions and hypotheses, learners research thoroughly, finding relevant information independently and evaluating it carefully to reach conclusion.<br>***Problem solving:***<br>This is an essential skill for life, where learners focus on solutions, planning ways forward, responding flexibly to changes and critically evaluating both methods and solutions. | |
| **Types of Activities**<br>• Present questions for investigation, with access to practical and written resources<br>• To do research and solve a problem,<br>• Tasks may include experiments and practical activities | **Types of contributions which teachers can see or hear**<br>**Research:**<br>• Using the most appropriate methods to search for information – key words, skimming, scanning,<br>• Choosing sources carefully – books, websites – and evaluating if they are trustworthy<br>• Considering what is relevant and what is irrelevant<br>• Using own words rather than copying<br>• Putting together information from different sources<br>• Trying to form an overview<br>• Reaching conclusions based on evidence<br>**Problem solving:**<br>• Identifying the key aspects of a problem<br>• Considering different ways to proceed and |

| | |
|---|---|
| | the different likely outcomes, by using hypothesis, prediction and testing out ideas<br>• Following a process carefully, reviewing as it proceeds<br>• Working out practical solutions<br>• Evaluating the outcome in terms of a successful solution<br>• Working with others, building on their ideas to reach a conclusion |

| **Critical thinking Checklist** | |
|---|---|
| Critical thinking varies with different subjects. In language and literature, and often in social sciences, there is **evaluation of the effectiveness of what is written or said**. In sciences and mathematics there is **evaluation of conclusions and scientific processes** of hypothesis, experimentation and results. | |
| **Types of Activities**<br><br>• Encourage evaluation of ideas and solutions<br>• Require explanations of why something is/is not useful, valid, believable or complete.<br>• Must also allow for disagreement and encourage learners to give reasons for different views. | **Types of contributions which teachers can see or hear**<br><br>• Reflecting on others' ideas and opinions<br>• Evaluating whether things are true<br>• Evaluating how well things are expressed and how convincing they are<br>• Evaluating results and evidence and drawing conclusions<br>• Considering how far an idea is workable<br>• Comparing ideas and information to reach a full understanding<br>• Estimating likely results and checks accuracy of calculations<br>• Suggesting where things are incomplete or wrong, with reasons<br>• Evaluating conclusions and their usefulness |

The competences below are not Generic Competences but are necessary to develop Key Unit Competences:

| **Literacy (reading and writing) Checklist** | |
|---|---|
| ***Reading:***<br>Reading is the skill of making meaning from written text by decoding letters and words, and understanding literal and implied meaning in sentences and whole texts. | ***Writing:***<br>Writing involves a complex set of skills which includes fine motor skills, being able to form letters and words and being able to express ideas and information in sentences and whole texts. This includes accuracy in grammar, punctuation and spelling. The aim of these skills is to communicate effectively to readers. |
| **Types of contributions which teachers can see or hear** | |
| **Reading**<br>• Connecting sounds and letters to make meaning<br>• Reading fluently and accurately<br>• Identifying the main points in texts<br>• Locate information in texts, using different techniques<br>• Understanding literal and implicit meanings | **Writing**<br>• Communicate clearly and imaginatively with a range of readers<br>• Writing simple and complex sentences with accurate grammar and punctuation<br>• Organizing and structuring writing to make meaning clear<br>• Spelling accurately<br>• Writing with neat, legible and joined handwriting |
| **Corresponding activities from the syllabus** | |
| read texts suited to their levels of literacy | writing tasks should give learners time to do this, including drafting, and to write in full sentences where appropriate. |

| **Numeracy Checklist** | |
|---|---|
| Numeracy is the foundation of mathematics and of the handling of data, solving problems and presenting information accurately across the curriculum. More complex mathematical operations at secondary level are included in mathematics and science subjects | |
| **Types of Activities:**<br>• The use of number operations and of different ways to present data should be integral to many subjects.<br>• Learners encouraged to use their numeracy independently. | **Types of contributions which teachers can see or hear**<br>• Using the 4 mathematical operations accurately<br>• Solving problems<br>• Making calculations, measurements and estimates correctly<br>• Representing data in different ways<br>• Understanding and interpreting data |

| **ICT/Digital Checklist** | |
|---|---|
| The use of various digital devices and computers, operating programmes, file organization, and being aware of the dangers and significance of technology in life and work. This competence relates to a variety of devices, eg mobiles phones, laptops, where available. | |
| **Types of Activities:**<br>• Use of ICT for recording, researching, reporting and presenting information and data<br>• Use ICT and digital resources, including mobile phones in studies | **Types of contributions which teachers can see or hear**<br>• Using digital devices and media to communicate<br>• Selecting and using the most efficient ways to find information on the internet<br>• Using digital communication positively and safely<br>• Saving and loading files<br>• Using a word processing program or spreadsheet |

## Appendices

Trainers are recommended to either print out materials in the appendices for participants or share them in soft form.

**Appendix 1. Assessment Sheet (Session 0)**

# Assessment Sheet

Date:

Name:

| Assessment | Good | Fair | Poor |
|---|---|---|---|
| (1) Did the teacher communicate lesson objectives? | | | |
| (2) Did the teacher introduce new concepts and terms? | | | |
| (3) Did the teacher structure the lesson well? | | | |
| (4) Did the teacher maximize learners' understanding (effective use of blackboard, notebook)? | | | |
| (5) Did the teacher maximize learners' understanding (effective use of textbooks and supplementary teaching materials)? | | | |
| (6) Did the teacher integrate generic competencies and cross cutting issues? | | | |
| (7) Did the teacher maximize learners' understanding (group work/pair work) ? | | | |
| (8) Did the teacher maximize learners' understanding (atmosphere) | | | |
| (9) Did the teacher maximize learners' opportunity? | | | |
| (10) Did the teacher assess/evaluate learning? | | | |

Comment:

## Appendix 2. Lesson Plan Format (Session 4)

**LESSON PLAN**

**School Name**: ……. **Teacher's name**: ……. ……

| **Term** | **Date** | **Subject** | **Class** | **Unit N°** | **Lesson N°** | **Duration** | **Class size** |
|---|---|---|---|---|---|---|---|
| ….. | … | ……. | …. | ….. | …… | …..… | … |
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | | | | | | | |

| | |
|---|---|
| **Unit title** | |
| **Key Unit Competence** | |
| **Title of the lesson** | |
| **Instructional Objective** | |
| **Plan for this Class (location: in / outside)** | |
| **Learning Materials (for all learners)** | |
| **References** | |

| **Timing for each step** | **Description of teaching and learning activity** | | **Generic competences** and **Cross cutting issues** to be addressed + **a short explanation** |
|---|---|---|---|
| | **Teacher activities** | **Learner activities** | |
| **Introduction** …min | | | |
| **Development of the lesson** …min | | | |
| **Conclusion** …min | | | |
| **Teacher self-evaluation** | | | |

## Appendix 3. Lesson Plan Sample (Session 4)

**LESSON PLAN**

**School Name**: ……. **Teacher's name**: ……

| Term | Date | Subject | Class | Unit N° | Lesson N° | Duration | Class size |
|---|---|---|---|---|---|---|---|
| II | 26 /6/ 2017… | SET…. | P4…. | 11…. | …6 . | 40min… | … |
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | | | | | | | |
| **Unit title** | Plants | | | | | | |
| **Key Unit Competence** | To be able to demonstrate stages of germination and establish the relationship between parts of plants and their function | | | | | | |
| **Title of the lesson** | Parts of the plant ♣ Roots ♣ Stem ♣ Leaf ♣ Flower . ♣ Fruit | | | | | | |
| **Instructional Objective** | At the end of this lesson, students should be able to<br>-Label different parts of the plant<br>-Understand proper feeding of rabbit<br>-Explain how to conserve or protect animals and plants as well as their socio-economic role | | | | | | |
| **Plan for this Class (location: in / outside)** | Classroom | | | | | | |
| **Learning Materials (for all learners)** | Charts, CARDS… | | | | | | |
| **References** | | | | | | | |

| **Timing for each step** | **Description of teaching and learning activity**<br>**Teaching parts and function of plant in connection with its role feeding rabbit** | | **Generic competences** and **Cross cutting issues** to be addressed + **a short explanation** |
|---|---|---|---|
| | **Teacher activities** | **Learner activities** | |
| **Introduction**<br>…5min | Who can remind me class rules? Motivation by posting smile and bad faces charts<br><br>Who can tell me what you eat at home?<br><br>Some food are plants and others are animals, who can tell me plants from what you are coming to tell? | Respect others, keep silent, …<br><br>Beans, cabbages, rice, meat, porridge, bread, carrots, …<br><br>Beans, bread, rice, cabbages, carrots | |
| **Development of the lesson**<br>…30min | Show and post a chart of plant and ask to draw it and label parts<br><br>Take labels' cards in hands<br>Who can come, take a card and put on respective part on plant?<br><br>Then, what is importance of plants? Discuss as you sit<br><br>One said plants give us umuyaga, what is it in English? | Individual work on drawing and labeling a plant posted on blackboard<br><br>One failed to put "root" in correct place others put: fruit, flower, stem, leaves correctly<br><br>umuyaga, eat, oxygen, umuti (medicine), construction<br><br>wind! | Environmental |

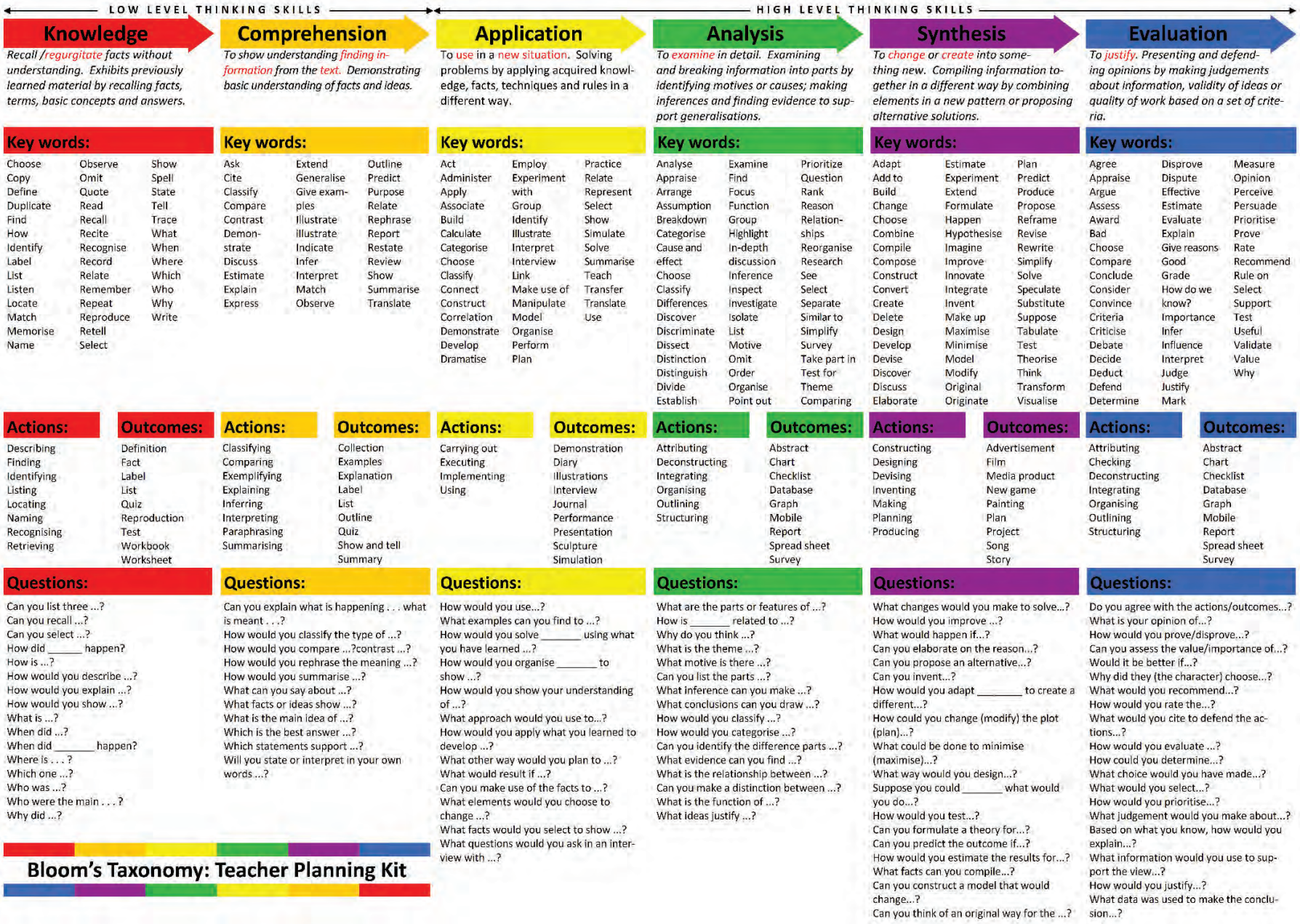
**Appendix 3. Lesson Plan Sample (Session 4)**

| | | | |
|---|---|---|---|
| | You said they can give food, who can give me example of animals that eat plants?<br><br>Okay, let us take an example of rabbit. What is the food of rabbit?<br><br>Does rabbit eat rice??<br><br>There is another food of rabbit "pellets"<br><br>It is food produced from factory.<br><br>Posts a rabbit's chart (eating grasses and maize growing) on blackboard. Do you see there?<br>Looking at that chart, discuss how to protect plants and animals.<br><br>Let other things: "not kill animals". If you kill them where can we get fertilizers?<br><br>Animals and plants are complement each other, we can get meat from them but in planned manner. | Cow, goat, sheep, pork (pig), hen, rabbit, …<br><br>Carrots, cabbages, beans, rice, grass, …<br><br>No!<br><br>What is pellets?<br><br>Yes, I see rabbit, maize, grass, rabbit feces, …<br><br>We can keep animals in farms, give animals good food<br><br>How can we get meat?<br><br>We can kill at least one! | |
| **Conclusion**<br><br>…5 min | Teacher sums up.<br><br>Homework: you will ask your parents how to protect environment. | Write homework | Financial |
| **Teacher self-evaluation** | | | |

**Problem focus: LOADED CURRICLUM**

**CONDENSING CONTENTS (different topics) IN 40 MINUTES PERIOD**

## Appendix 4. Bloom's Taxonomy (Session 7)



**Appendix 5. Rubric Example 1 from Phase II CBC Training (Session 9)**

Marking Rubric

| | **Marking Rubric for Presentations** (Single learner/Group) | | | | |
|---|---|---|---|---|---|
| | 4 | 3 | 2 | 1 | Marks |
| Visual appeal | There are no mistakes in the concepts used, the communication skills are integrated in the presentation.<br>The visuals capture the attention of the audience. | There are a few errors in description of some concepts used. The information is not presented in a logical order while presenting.<br>Visuals are good. | There are various errors observed visual in visuals which means that concepts are not well expressed.<br>Information is not well sequenced.<br>The audience is not clearly involved. | There are several of errors in description of concepts and how they are presented.<br>Writing/ illustration is poor/low quality with small fonts used. The data presented not attractive.<br>Failure to present accurately what is prepared/No visual appeal at all. | |
| Comprehension | Shows extensive knowledge and understanding of the topic being applied.<br>The members/presenter shows appropriate understanding of the task.<br>Provided appropriate solutions to the questions asked. | The presenter/members show a moderate understanding of the Unit/Topic.<br>Able to provide solutions to the questions asked by the audience. | Shows inadequate understanding of a few sub-sections of the Unit. | The presenter/members show no signs of understanding the content of the unit.<br>Wrong and inappropriate information provided by the presenter/members. | |
| Presentation skills | The presenter/members show high level communication skills/Used gestures/enabled the audience to stay focused/audience was engaged/ voice audible enough/eye contact at most times. | The presenter/members pay attention to the individuals in the audience/ use eye contact regularly/involve the audience/speak at a fair volume/ lack some confidence while speaking/presenting/discussing. | The presenter/members used sporadic eye contact/the audience was not fully able to remain focused/ less involvement of audience/not audible enough/limited gestures used. | Minimal eye contact by the presenter/most members focusing on a very small portion of the audience.<br>Zero involvement of the audience/speak at high speed (Quickly) /low tone.<br>Inappropriate/unnecessary gestures (Body Language). | |

**Appendix 5. Rubric Example 1 from Phase II CBC Training (Session 9)**

| | | | | | |
|---|---|---|---|---|---|
| Content | The presenter/members presented a concise summary of the unit.<br>All questions are adequately answered.<br>Unit/topic adequately covered.<br>Relevant information is provided. | The presenter/members presented a good summary of the unit.<br>Most vital information is provided.<br>Little irrelevant information is presented. | Educational is presented information.<br>Many questions from the audience are not answered.<br>Not all important points are given.<br>Much irrelevant information is presented. | The presentation shows insufficient information.<br>Significant points left out.<br>Irrelevant points dominate the presentation. | |
| Preparedness/ Participation/Group dynamics (If the work is done in groups) | The presenter/all members adequately know the unit content/information.<br>Participate actively.<br>Teamwork is evident (Where group work is used).<br>Extremely well-prepared and planned for presentation. | Dominated the discussion/slight domination of one presenter.<br>If working in groups, members assisted each other.<br>Adequately prepared. | The presenter /members spent much time trying to get information arranged leaving the audience unattended to.<br>Read the slides/or hard copies of the presentation.<br>Inadequately prepared. | Presentation not well-balanced.<br>Too much seeking for assistance and clarity from the audience that asked questions/Complete lack of listening skills.<br>Complete lack of preparation/rehearsal.<br>Total dependency on hard copies or slides. | |

Comments

.....

.....

**Appendix 5. Rubric Example 2 from Phase II CBC Training (Session 9)**

**Student Assessment Rubric**

**The document below is an individual student assessment rubric that teachers can use to track learners' progress in developing the generic competences outlined in the competence-based curriculum.**

School name: …….. Class: ……..
Date…….. Academic year: …….
Name of student: …… Subject: ……..

| General areas to be assessed | Description | Achievement exceeds expectation 4 | Achievement meets expectation 3 | Achieved below expectation 2 | Not achieved 1 | Comments |
|---|---|---|---|---|---|---|
| Interpersonal relationship | Working as a team member and collaborating with others | | | | | |
| | Respecting views and rights of others and accepting positive criticism | | | | | |
| Communication | Communicating and conveying confidently and effectively information and ideas through speaking and writing and other forms of communication using correct language structure and relevant vocabulary effectively in a range of social and cultural contexts. | | | | | |
| | Writing coherent and logical reports | | | | | |
| Critical and creative thinking | Uses critical and creative thinking skills with a high degree of effectiveness | | | | | |
| Research and problem solving | Produce new knowledge based on research of existing information and concepts and sound judgment in | | | | | |

**Appendix 5. Rubric Example 2 from Phase II CBC Training (Session 9)**

| General areas to be assessed | Description | Achievement exceeds expectation 4 | Achievement meets expectation 3 | Achieved below expectation 2 | Not achieved 1 | Comments |
|---|---|---|---|---|---|---|
| | developing viable solutions | | | | | |
| Co-operation | Co-operating with others as a team in whatever task assigned. | | | | | |
| Innovation | Use imagination beyond knowledge provided to generate new ideas to enrich learning. | | | | | |
| Mastery of the content | Demonstrate understanding of the content | | | | | |
| Values and Attitudes | Demonstrate positive values and attitudes | | | | | |
| Acquired unit competence | Demonstrate the mastery of the key unit competence | | | | | |

Teacher's name and signature:

**Appendix 5. Rubric Example 3 from Phase II CBC Training (Session 9)**

| Category: | Excellent | Good | Satisfactory | Poor | Score |
|---|---|---|---|---|---|
| | 4 | 3 | 2 | 1 | |
| **Relevance** | Points made are all relevant to the topic | Points made are nearly all relevant to the topic | Some points made that are not relevant to the topic | Several points made that are not relevant to the topic | |
| **Support with Facts** | Many facts are used to support argument | Some facts are used to support argument | One or two facts are used to support argument | Facts are not used to support argument | |
| **Persuasiveness** | Arguments made are always clear and convincing | Arguments are mostly clear and convincing | Arguments are sometimes clear and convincing | Arguments are rarely/never clear and convincing | |
| **Teamwork** | Team members talk for roughly equal amounts of time (25%) | One team member dominates (talks >50% of the time) | One team member dominates (talks >75% of the time) | Only one team member contributes to argument | |
| **Organization** | Opening statement electrifies audience. | Opening statement grabs the attention of the audience. | Opening statement introduces topic | No clear opening statement to introduce topic | |
| | Closure convinces audience | Brings closure to the debate | Brings some closure to the debate | No clear closing statement | |

**Debate Scoring Grid**

**TOTAL _____**

Created by Simon Gana and Emily Meldrum, VSO advisors

**Appendix 6. SMART Task Checklist (Session 10)**

# SMART Task Checklist

| | |
|---|---|
| **S (Specific)** | • Does the assessment task clearly align with the standards and the unit taught?<br>• Is the task easy to understand for all readers in the same way?<br>• Does the task provide enough information for learners to complete it? |
| **M (Measurable)** | • Does the task provide opportunities for learners to develop self-evaluation skills?<br>• Does the task include assessment criteria which shows evidence that learners have developed the required knowledge, skills, attitudes and values? |
| **A (Achievable)** | • Is the level of the task appropriate for learners at this stage? |
| **R (Relevant)** | • Does the task include a generic competence?<br>• Does the task test knowledge, skills, attitudes and values of learners?<br>• Does the task allow learners to apply what they have learned to solve a problem or apply what they know to a real-life situation?<br>• Is the task academically correct?<br>• Does the task use locally available materials?<br>• Does the evidence needed in the assessment criteria align with the task?<br>• Is it possible to prepare the task within manageable time? |
| **T (Time-bound)** | • Does the task allow learners to complete within reasonable duration of time? |

# Appendix 8. Material for DCC Orientation and Problem-Analysis Workshop

# Orientation for the District
# District CPD Committee

## Strengthened role of district for continuous learning of teachers

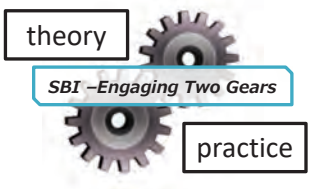
# Project Scope

**The Project aims at providing technical support and expertise to REB/TEMP to realize the nationwide professional development mechanism for all teachers.**

- **Project Period: Jan. 2017 -- Dec. 2019 (3 Years)**
- **Target: Primary and secondary school teachers (mainly math and science)**

- **Component 1: contents development for REB CBC training (math and science)**
- **Component 2: strengthening M&E mechanism at sector and district level**
- **Key approach: To transform theory into practice through SBI**

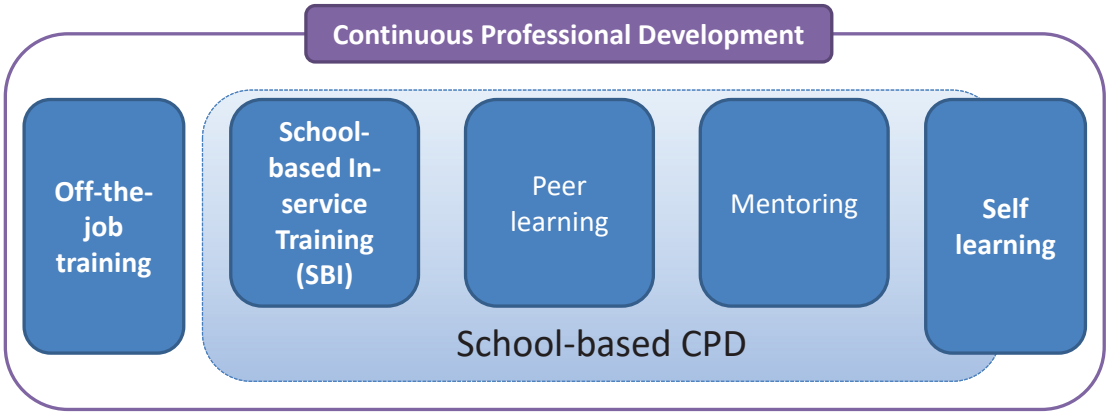
- **Project members: 6 Japanese experts + 2 Rwandan staff + REB counterparts**
- **Project office: in TEMPD, REB**



# In-school factors influencing the quality of lessons

# Importance of Continuous Professional Development of Teachers

- **Like any other professionals, teachers have a responsibility and owe it to themselves and their profession to deepen their knowledge, extend their skills and keep themselves abreast with major developments affecting their profession.**
- **CPD can take place both outside and inside the school.**



# School-based CPD and CBC

- In the CBC, the teacher is expected not only to deliver the knowledge, but also to facilitate the learners in their learning process to attain expected competencies intended in the curriculum.
- Good facilitator should be able to customize the lesson based on the different characteristics of each class. They should always be reflective of their practice to constantly improve it.
- **Sector/School-based CPD(Continuous Professional Development)** will serve as a platform to continuously explore the best approach to the learners in that sector.



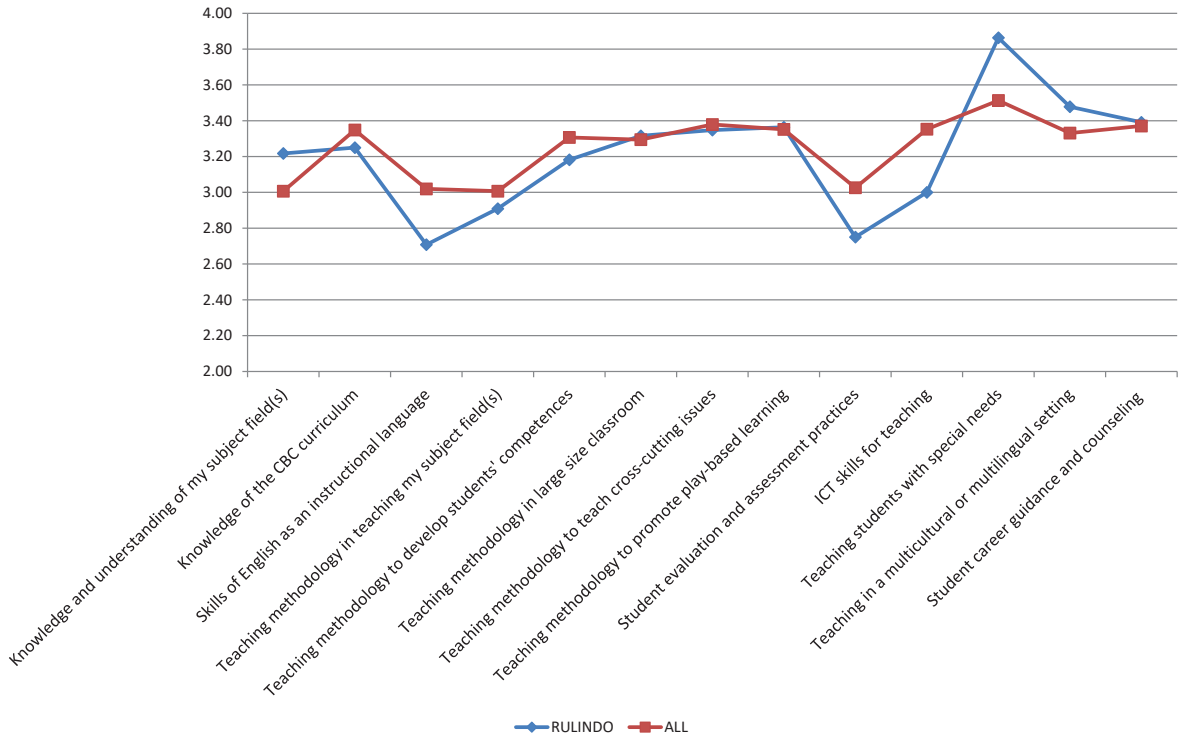
# National/Local Demarcation in CBC Training

| | |
|---|---|
| REB | ✓ Develop a training system which is able to disseminate contents to all teachers<br>✓ Develop training materials<br>✓ Train National Trainers (NTs) who trains Sector-based Trainers (SBTs)<br>✓ Develop a monitoring system that enables REB/District/Sectors to provide solutions to address challenges for the teachers |
| District (DCC/DEO) | ✓ Make sure that teachers in service in the district are trained through Sector-based CPD sessions<br>✓ Monitor and evaluate Sector-based CPD conducted in the district and take actions accordingly. |
| Sector (SEO) | ✓ Make sure that teachers in the sector are trained through the Sector-based CPDs<br>✓ Monitor and evaluate Sector-based CPDs and take actions accordingly |

# What DCC can bring to the district?

- **Strengthened and systematic monitoring of schools by using evidence and objectively analyzing it**
- **Customized solution according to the challenges which may differ district by district**
- **Better implementation of school-based CPD, which is the only activity that teachers can continuously improve their performance. It also contributes to mitigate in-school factors for the dropout, which is one of the imihigo targets of Nyarugenge district.**

# Teachers' training needs on CBC



# SIIQS's support

- As per districts' request, SIIQS can provide technical support in
  - conducting a problem analysis workshop with an experienced Japanese expert in this area and to develop district's CPD action plan
  - Finding DPs in support some CPD activities in the district

# DCC Problem Analysis Workshop

JICA SIIQS Project

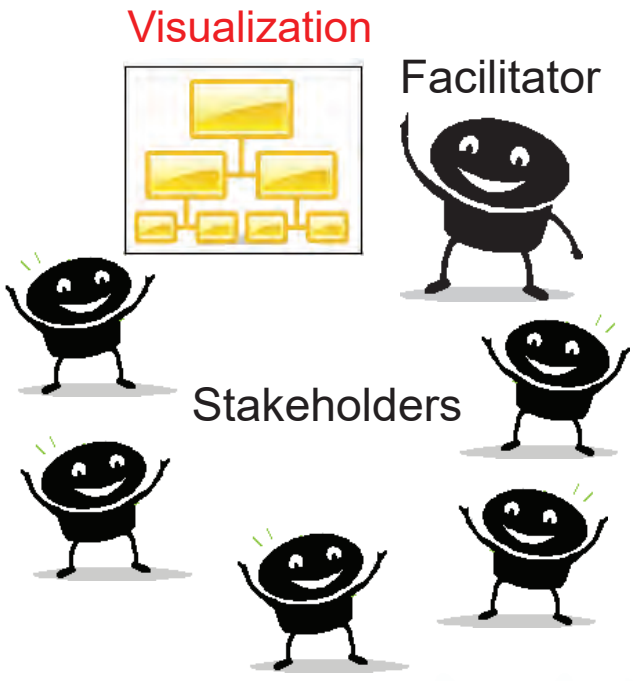
## Objectives of this Workshop

1. To analyze challenges on quality of education in your district
2. To make an action plan for DCC based on your analysis

# Today's Program

Presentation & Group Activities
Step 1: Problem Analysis
Step 2: Objective Analysis
Step 3: Presentation & Discussion
Step 4: Action plan development

# Today's Program



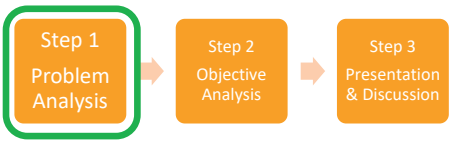

**Participatory Workshop**

✓Visualization
✓Consensus

1. Write your own idea on your card.
2. Write one idea on a card.
3. Write facts specifically.
4. Write cards before discussion.
5. Take a consensus within your group before removing cards from the board.
6. Do not criticize ideas that other members wrote.

# Step 1: PROBLEM ANALYSIS

## Step1: Problem Analysis




＜Aims＞

1. To identify existing problems faced by a target group.
2. To analyze the identified problems in form of a cause and effect diagram called “Problem Tree”

＜ Why do we do this analysis?＞

This analysis will give you clear ideas how existing problems relate with each other.

# Step1： Problem Analysis

Step 1 Problem Analysis → Step 2 Objective Analysis → Step 3 Presentation & Discussion

＜Example case＞

A friend of mine called Ms.Toyota is a math teacher. She works for a primary school in your district.

She is good at teaching and her students love her very much.

However, she has one problem. She always comes late for school. She wants to know why she is always late and wants to be a punctual teacher.

**＜Ms. Toyota's problem＞**
**Ms.Toyota is always late for school.**

# Step1： Problem Analysis

Step 1 Problem Analysis → Step 2 Objective Analysis → Step 3 Presentation & Discussion

**Whose problem? : Ms. Toyota (Target group)**
**Target Area: XXX district**

Effect ↕ Cause

- **Ms. Toyota is always late for school.** ← **Core Problem**
  - She leaves her home late.
    - She can't get up early.
      - She doesn't go to bed early.
    - She takes a lot of time to prepare herself in the morning.
  - Motos can't be found easily in the morning. ← **Direct Causes**
    - Many people use motos.

# Step1: Problem Analysis

How to do this analysis…?

1. Identify a **Target Group** and **Core Problem**.
2. Find out problems that directly cause the Core Problem (**Direct Causes**), and place them under the Core Problems.
3. Find out problems that cause the Direct Causes, and place them under the Direct Causes.
4. Repeat finding causes and complete a "Problem Tree" diagram.

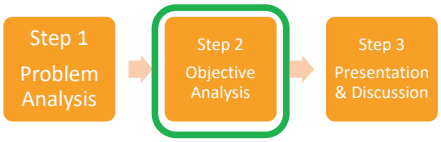
# Step1: Problem Analysis

Some rules of this analysis…

1. Write the facts.
2. Write problems (negative sentences).
3. Write only one problem on a card.
4. Do not write a cause and effect on one card.
5. Do not use sentences like "There is no (smth/sb)" or "We do not have (smth/sb)". Find problems that are results of lacks/absence of resources.
6. Avoid "*Zingalo*" analysis. Find out different causes for each problem.

# Step 2: OBJECTIVE ANALYSIS

## Step2: Objective Analysis




＜Aim＞

To examine “means” and “ends” to achieve an objective by making a tree diagram.

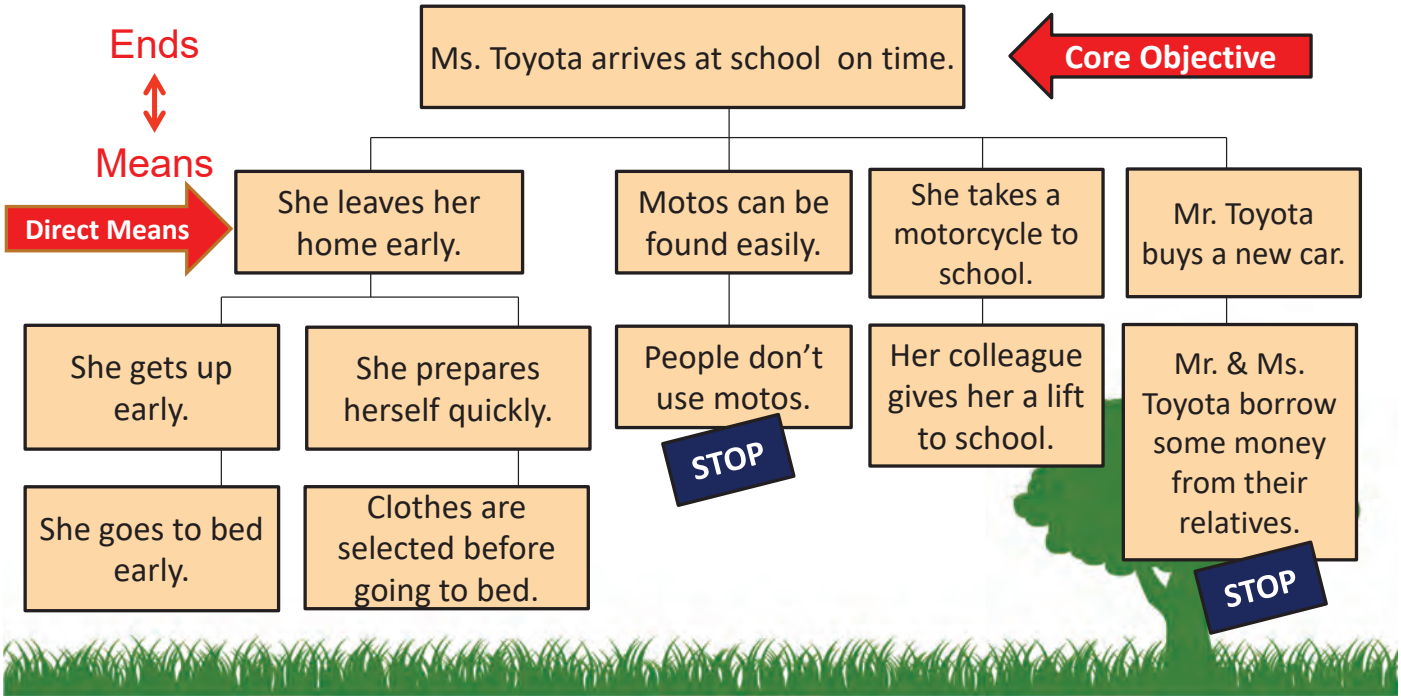
＜ Why do we do this analysis? ＞

This analysis will give you clear ideas how to achieve your objective.

# Step2: Objective Analysis

Step 1 Problem Analysis → Step 2 Objective Analysis → Step 3 Action Plan

**Target Group: Ms. Toyota**
**Target Area: XXX district**




# Step2: Objective Analysis

Step 1 Problem Analysis → Step 2 Objective Analysis → Step 3 Presentation & Discussion

How to analyze…?

1. Identify a **Core Objective**. Rephrase the sentence to a desired situation.
2. Rephrase **the Direct Means** (the Direct Means) and find out other direct means, and place them under the Core Objective.
3. Repeat finding means and complete a "Objective Tree" diagram.

# Step2: Objective Analysis

Step 1 Problem Analysis → Step 2 Objective Analysis → Step 3 Presentation & Discussion

Some rules of this analysis…

1. Consider feasible means and ends.
2. Consider if negative effects happen when "means" are taken.
3. Consider other means if needed.

# Step3: Presentation & Discussion

Step 1 Problem Analysis → Step 2 Objective Analysis → Step 3 Presentation & Discussion

**Let's share your analysis with your colleagues !**

**Presentation**
**&**
**Discussion**

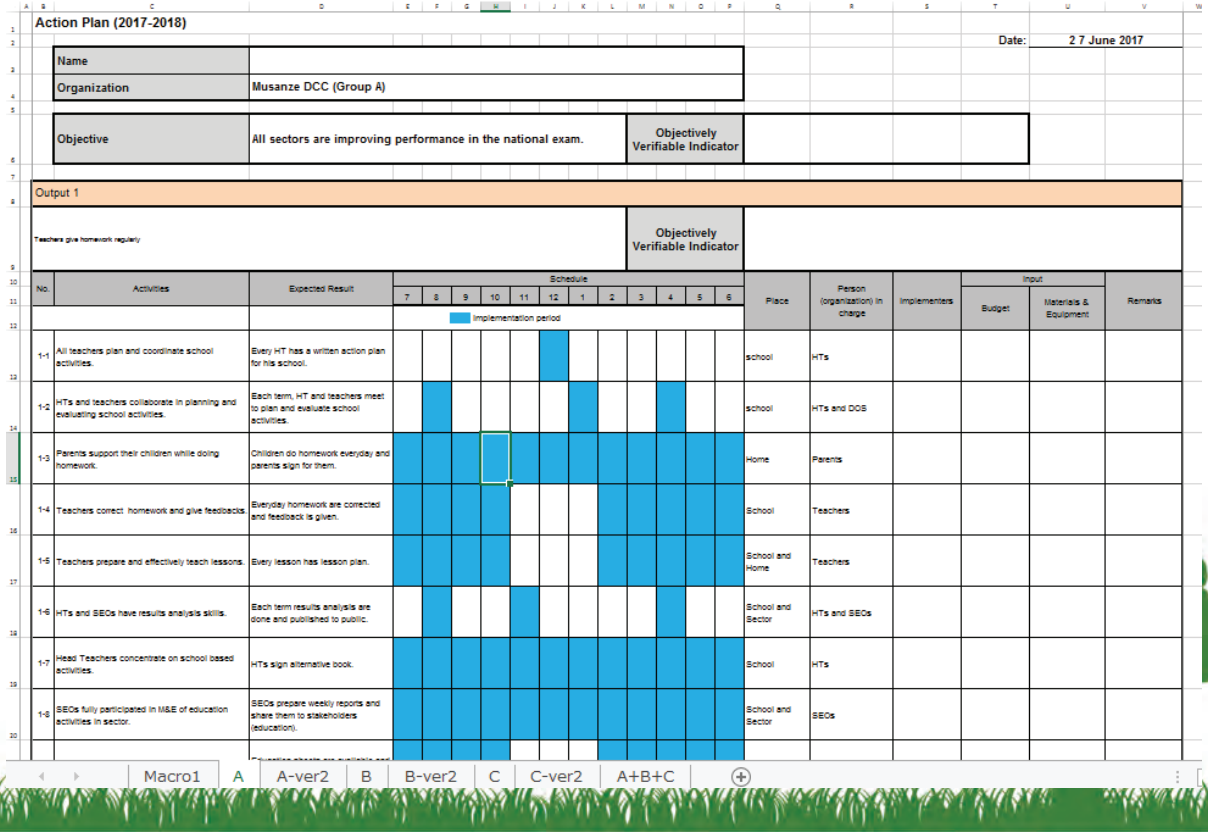
# Step 4: ACTION PLAN DEVELOPMENT

## Action Plan Format

| Output 1 | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | **Objectively Verifiable Indicator** | | | | | | |
| No. | Activities | Expected Result | Schedule | | | | | | | | | | | Place | Person (organization) in charge | Implementers | Input | | Remarks |
| | | | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | | | | Budget | Materials & Equipment | |
| | | | | | | | | | | | | | | | | | | | | |
| 1-1 | | | | | | | | | | | | | | | | | | | | |
| 1-2 | | | | | | | | | | | | | | | | | | | | |
| 1-3 | | | | | | | | | | | | | | | | | | | | |

# Step4: Action Plan

Step 1 Problem Analysis → Step 2 Objective Analysis → Step 3 Presentation & Discussion



Action Plan (2017-2018)

Date: 2 7 June 2017

| | |
|---|---|
| Name | |
| Organization | Musanze DCC (Group A) |

| | | | |
|---|---|---|---|
| Objective | All sectors are improving performance in the national exam. | Objectively Verifiable Indicator | |

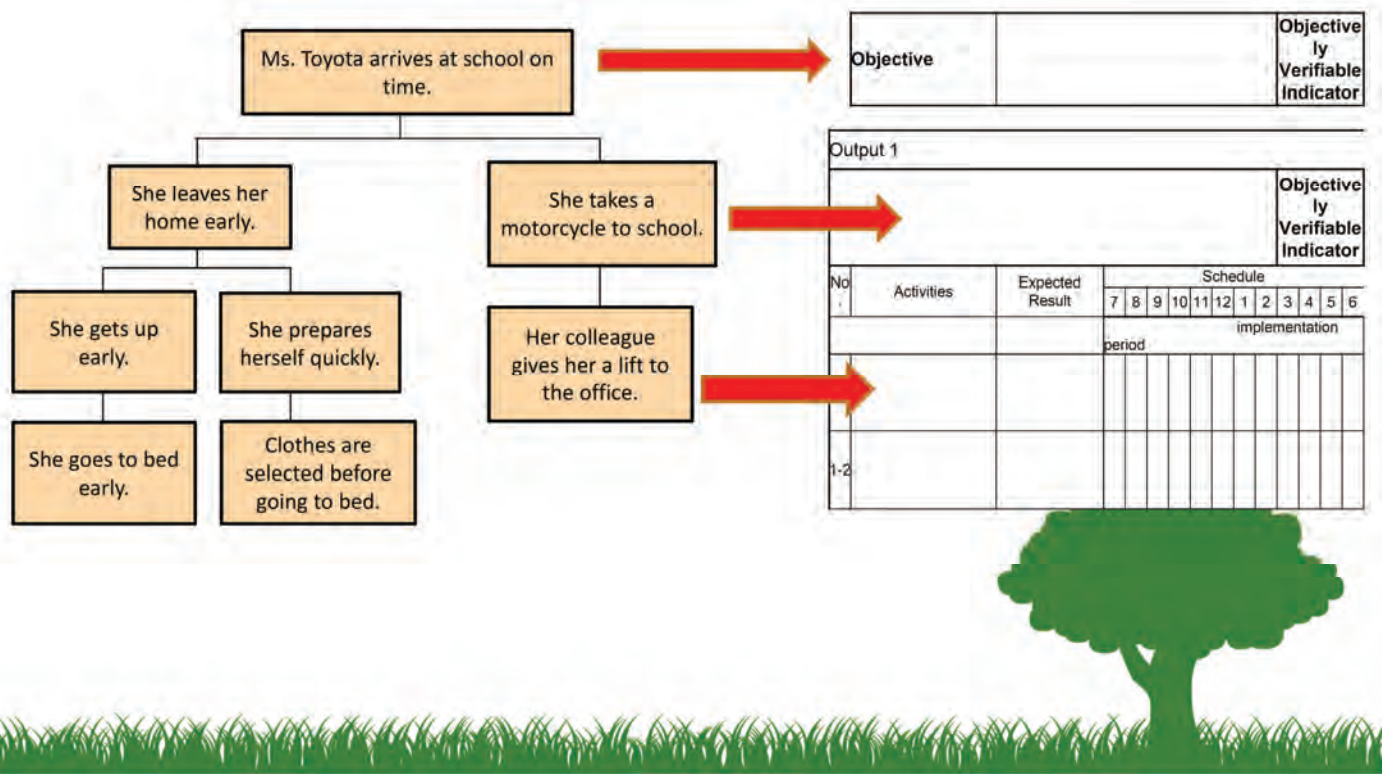
Output 1

| | | Objectively Verifiable Indicator |
|---|---|---|
| Teachers give homework regularly | | |

| No. | Activities | Expected Result | Schedule (7 8 9 10 11 12 1 2 3 4 5 6) | Place | Person (organization) in charge | Implementers | Input: Budget | Input: Materials & Equipment | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | implementation period | | | | | | |
| 1-1 | All teachers plan and coordinate school activities. | Every HT has a written action plan for his school. | | school | HTs | | | | |
| 1-2 | HTs and teachers collaborate in planning and evaluating school activities. | Each term, HT and teachers meet to plan and evaluate school activities. | | school | HTs and DOS | | | | |
| 1-3 | Parents support their children while doing homework. | Children do homework everyday and parents sign for them. | | Home | Parents | | | | |
| 1-4 | Teachers correct homework and give feedbacks | Everyday homework are corrected and feedback is given. | | School | Teachers | | | | |
| 1-5 | Teachers prepare and effectively teach lessons. | Every lesson has lesson plan. | | School and Home | Teachers | | | | |
| 1-6 | HTs and SEOs have results analysis skills. | Each term results analysis are done and published to public. | | School and Sector | HTs and SEOs | | | | |
| 1-7 | Head Teachers concentrate on school based activities. | HTs sign alternative book. | | School | HTs | | | | |
| 1-8 | SEOs fully participated in M&E of education activities in sector. | SEOs prepare weekly reports and share them to stakeholders (education). | | School and Sector | SEOs | | | | |

Macro1 | A | A-ver2 | B | B-ver2 | C | C-ver2 | A+B+C

# Step4: Action Plan



# Step4: Action Plan

Indicators should be **MEASURABLE**.
Indicators are **MONITORED** to check its achievements.

What should be included in Objectively Verifiable Indicators?

| OBJECTIVE | Ms. Toyota arrives at school on time. |
|---|---|
| 1. What? (Type of Data) | The annual average number of days she arrives at school on time |
| 2. Whose? | Ms. Toyota |
| 3. How much? (Quantity) | Increase by 80% as compared with the annual average number of days in 2017 |
| 4. How well? (Quality) | With good health conditions |
| 5. By When? | 2019 |
| 6. Where? | Karongi |

By December 2019, the annual average number of days Ms. Toyota who lives in district arrives at school on time will increase by 80% with good health condition as compared with that in 2017.

# Step4: Action Plan

**Discussion to agree on one action plan**

Points to consider

- ✓ What outputs are more important?
- ✓ What outputs are easy to be achieved?
- ✓ What outputs are urgent?

Murakoze Cyane !

# Appendix 9. Revised Concept Note for DCCs and SCCs

**Revised Concept Note for DCCs and SCCs**

**Background**

Vision 2050 aspires to take Rwanda beyond high income to high living standards by the middle of the century. Its income targets are to attain upper middle income country status by 2035 and high income status by 2050 with the intention of providing high quality livelihoods and living standards to Rwanda citizens by mid-century. Education provides the foundation for achieving prosperity and the Competence-Based Curriculum is the tool for ensuring that Rwanda's children develop the knowledge, skills, attitudes and values that will enable them to contribute to national development. However, the National Strategy for Transformation highlights that whilst access to primary education has reached near universal levels there has been mixed overall performance in education during the period of the Vision 2020 exemplified by falling primary completion rates and low net enrolment rates at secondary level. It concludes that increased access can adversely affect quality.

The challenge now is to raise the quality of education to maximise the learning of children. Effective continual professional development (CPD) of teachers and school leaders is essential to significantly impact on the quality of education going forwards. The greatest opportunity for CPD for teachers is at the school level. This is where teachers can frequently engage with each other to support improvement in practice, whilst setting an expectation of daily self-reflection which is critical for teachers' development. At the same time CPD of school leaders, including SGAC members is also required to ensure improvements in teaching and learning.

The new draft ESSP for 2018 to 2023 has an emphasis on strengthening professional development and on tracking learning at various levels within basic education. With a highly decentralised political system in Rwanda it is necessary that the drive to improve teaching and school leadership and track children's learning is apparent at district and sector levels to improve the overall performance of the education sector.

**District and Sector Continual Professional Development Committees for Raising Quality of Education**

It is proposed that District and Sector Continual Professional Development Committees (DCCs and SCCs) are established as sub-committees of District and Sector Education Councils to undertake evidence-based planning, monitoring and evaluation related to teachers' and school leaders CPD and its impact on their practice and children's learning. This represents a broadening of the scope and purpose of existing DCCs and SCCs and would support district and sector administrations to own efforts for improving the quality of education.

**Rationale for revised concept for DCCs and SCCs**

District and Sector officials have lacked full engagement in programmes and activities aimed most directly at improving teaching, school leadership and children's learning. However, in the Rwanda decentralised system it is local level ownership of development efforts which result in the highest impact. Currently, efforts to improve the quality of education are mainly captured in the plans and associated monitoring and evaluation of MINEDUC, REB and development

partners. Without real local ownership of those plans and processes, implementation and impact has been inconsistent producing mixed results in terms of education performance.

Establishing and operationalizing DCCs and SCCs would enable districts and sectors to take ownership for improving the quality of education, whilst providing strong support for government and development partner quality education initiatives. In time it would be expected that districts, sectors and schools will set the agenda for improving CPD for teachers and school leaders in their areas based on more specific knowledge of their learning needs and what works in the localized contexts.

By positioning the DCCs and SCCs as sub-committees of the District and Sector Education Councils evidence-based consideration of progress on quality of education will be brought more fully into council meetings. Sustained operations of the committees would be supported through their linkage with established mechanisms and the opportunity for coordinated efforts of districts, sectors and partners to improve the quality of education would be substantially increased.

Furthermore, the broadening of the scope and purpose of the committees would fix attention on a range of factors that impact on teachers' CPD including that of school leadership by head teachers and SGACs. At the same time evidence of impact on teachers' classroom and school leaders' practice and on learning will enable evaluation of the effectiveness of CPD activity to inform continual improvement in provision. Overall, the purpose of the committees would more closely relate to the aims of REB's TEMPD department and the new ESSP which is focused on factors that most directly contribute to quality education.

**Membership of the DCCs and SCCs**

The recommended membership of the DCCs would be:

- Vice-Mayor for Social Affairs
- District Education Officials
- All SEOs
- Representatives of Head Teachers, SGAC chairpersons and Teachers
- Representatives of TTCs (where present in the district)
- Representatives from development partners with relevant programmes/projects in the district

The recommended membership of the SCC would be:

- Sector Executive Secretary
- Sector Education Officer
- All sector Head Teachers
- Teacher Representatives
- SGAC chairpersons (invited when relevant)
- Representatives from development partners with relevant programmes/projects in the sector

**Frequency of DCC and SCC Meetings**

The regular meetings are recommended to take place on a termly basis. This will provide sufficient time between meetings for data collection and field monitoring and meetings would be sufficiently frequent to enable changes to be made in relation to provision of CPD on a regular basis.

**DCC and SCC Key Functions**

The committees would have 5 main functions:

- Planning
- Monitoring
- Evaluation
- Review and Learning
- Reporting

The effective combination of these functions would involve regular adaption of content and methodology of CPD for teachers and school leaders based on evidence of needs. This would result in improvement in practice to impact on learning.

<u>Planning</u>

On a yearly basis DCCs and SCCs will produce an action plan. The plan will include details on:

- Timing, content and methodology of CPD activities at school, sector and district levels for teachers and school leaders, including SGACs
- Data to be collected on implementation of CPD, teachers' and school leaders' practice and learning of children
- How data will be collected and frequency

The quantity and frequency of CPD and data at pre-primary, primary and secondary levels will be different according to needs and availability of resources.

The content of the plans will combine planned activities of the district, sectors, REB and development partners. Therefore the committee will undertake functions of monitoring, evaluation, review and learning in relation to these plans. This will enable more effective collaboration between local government and development partners in regard to these functions, whilst enabling greater support for REB programmes of activities.

The extent to which CPD meets the training needs of the people engaged in the activities determines the effectiveness of the CPD. The collection and consideration of data on teachers' and school leaders' practice and data on learning at sector level and district level will support identification of more specific CPD needs. Also, this data will support identification of what works and what does not work in terms of methodologies of CPD in the local context. In time, therefore, DCCs and SCCs can support a process by which CPD more specifically meets the needs of the teachers and school leaders in their areas and is less dependent on larger top-down programmes of government and development partners. As such DCC and SCC plans should become over time more contextualised

Monitoring

Data collection and investigative field visits undertaken by district and sector officials and development partners will support monitoring. This will involve finding out what CPD activities have been undertaken and how they have been implemented and also consideration of evidence of impact of CPD on teachers' and school leaders' practice and periodically on learning. As electronic data collection become more prevalent and MINEDUC's and REB data management systems develop more data will be accessed direct from the system whilst other data, including more qualitative data, will be provided directly to the committee.

This evidence can be used to track progress against output and outcome indicators of relevant parts of district, sector and development partner plans. Consideration of this evidence can lead to updating of the committees' action plans and/or the district, sector and development partners' plans. There should also be discussion on challenges faced and any lack of action or lack of commitment to achieve the objectives of the action plan and also discussion on what is working well which could be scaled up. Agreements on remedial actions should also be agreed to improve implementation of the committees' action plan. At district level the responsibility for remedial actions will focus mainly on SEOs whilst at sector level the responsibility will focus mainly on school leaders.

The key results of monitoring by the SCCs should be communicated to the DCCs and vice versa.

Evaluation

Evaluation involves assessment of impact and efficiency and leads to consideration of whether there should be significant changes in approach or not. In terms of impact evidence would inform the extent to which CPD is positively affecting the practices of teachers and school leaders and learning. In terms of efficiency there would be discussion about the extent to which the methodology, types, frequency and timing of CPD are resulting in impact.

Evaluation can take place periodically through the year informed by monitoring. However, it must take place thoroughly at the end of the year of the action plan.

The key findings from evaluation by SCCs should communicated to the DCC and vice versa.

Review and Learning

This follows on from evaluation. Key questions would be: what has worked well and what has not worked well? What should be changed in terms of provision of CPD? What strategies can be used to share best practices across the district, or across the sector? What data do we have which provides new evidence on the training needs of teachers and school leaders?

Again, review and learning can take place through the year. However, deeper discussion based on evidence should follow on from the thorough evaluation at the end of the year of the action plan and the answers to the key questions would inform the development of the next annual action plan of the committee and the plans of districts, sectors and development partners.

Key learnings identified in SCCs should be communicated to the DCC and vice versa.

Reporting at District and Sector Level

The DCC should report to the District Education Council and the SCC should report to the Sector Education Council. Information and conclusions derived from the processes of planning, monitoring, evaluation and review and learning will inform the content of the reports.

**Reporting to REB**

It is expected that data that REB required periodically through the year will be mainly collected electronically and fed into its data management system and therefore there would not need for regular reporting to REB about its CPD programmes. However, it will very useful for DCCs to report to REB about its learning in relation to CPD to inform REB's programmes of training. In addition, it would be good for DCCs to have an opportunity to feedback on their functioning and support needs.

REB will consider the most efficient approaches for enabling DCCs to report and enable discussion of issues.

**Capacity development support for DCCs and SCCs**

Evidenced-based approaches to planning, monitoring, evaluating, reviewing and learning of quality education focused around the provision and impact of CPD requires the development of skills of District and Sector officers, particularly around the analysis and use of data. Over the next few years collectively development partners are well-positioned to provide support in skill development across all districts to enable DCCs and SCCs to function effectively.

**Conclusion**

It is essential for the successful implementation of the National Strategy for Transformation and the new ESSP that district and sector administrations are fully-engaged in ensuring that CPD is effectively and regularly undertaken by every teacher and school leader in Rwanda. Fully-functioning DCCs and SCCs would enable local government and development partners to collaborate in planning, monitoring, evaluation, review and learning in relation to the provision of CPD. As such more effective implementation of the Competence-based Curriculum should follow resulting in children developing the knowledge, skills, attitudes and values required to provide the foundation for future national prosperity.

# Appendix 10. Guideline for Sector/School-based Continuous Professional Development (CPD) for CBC

REPUBLIC OF RWANDA

MINISTRY OF EDUCATION

Rwanda Education Board

# Teacher Training Manual Phase II

## COMPETENCE –BASED CURRICULUM (CBC)

## Guideline for Sector/School-based Continuous Professional Development (CPD) for CBC

January 2017

## Acknowledgement

The introduction of a CBC calls for a big paradigm shift for teachers. It requires comprehensive change and new thinking with regard to instructional approaches in teaching, learning and assessment processes. However, most teachers tend to teach using approaches through which they were taught. Since CBC requires teachers not only to deliver the knowledge but also to facilitate learners in their learning process to attain expected competencies, they need to customize the lesson based on the different characteristics of each class. Trainings at ground level serve as an optimal platform for teachers to continuously explore the best approaches to the learners in their locality.

I would like to highlight the importance of making sure that all teachers are trained in CBC because learners have an equal right to receive good quality education according to the new curriculum. SEOs are expected to coordinate trainings at sector and school level and report any challenges to the district. District, as an employer of teachers, is expected to supervise trainings conducted at sector and school level and make sure that all teachers are trained. Training teachers in CBC also contributes to mitigate the dropout, which is one of the imihigo targets in most of the districts, because it helps teachers teach in a learner-friendly manner.

I express my sincere gratitude to the all development partners for their technical support in developing this material. Their support significantly contributed to the successful production of this material by Teacher Management and Professional Development Department (TEMPD).

Gasana I Janvier
Director General
Rwanda Education Board

List of Abbreviations

| | |
|---|---|
| CBC | Competence Based Curriculum |
| CPD | Continuous Professional Development |
| DCC | District Continuous Professional Development Committee |
| DEO | District Education Office |
| DoS | Director of Studies |
| HT | Head Teacher |
| MINEDUC | Ministry of Education |
| M&E | Monitoring and Evaluation |
| NT | National Trainers |
| LP | Lower Primary |
| LS | Lower Secondary |
| PDSI | Plan-Do-See-Improve |
| Off-JT | Off the Job Training |
| OJT | On the Job Training |
| REB | Rwanda Education Board |
| SBI | School Based In-service Teacher Training |
| SBT | Sector Based Trainer |
| SBM | School Based Mentor |
| SEO | Sector Education Officer |
| S-SBI | Standardized School-based In-Service Training |
| SSL | School Subject Leader |
| SoW | Scheme of Work |
| T/L | Teaching and Learning |
| TTC | Teacher Training College |
| UP | Upper Primary |
| US | Upper Secondary |
| URCE | University of Rwanda – College of Education |

# 1. Purpose of this Guideline

CBC training contents should be cascaded to sector level to train all teachers so that they become competent in teaching according to the CBC. District and Sectors are responsible in ensuring that all teachers are trained at the sector level.

The final stage of CBC training will take place at the sector level. This is called Sector-based Continuous Professional Development (CPD). Sector-based CPD is a good way to involve all teachers in CBC training effectively and efficiently, with minimum sacrifice of the classes to attend trainings. CPD at the sector and school level also provides opportunity for teachers to continuously improve the lesson and generate new ideas to improve teaching and learning (T/L) appropriate to the local context.

The purpose of this guideline is to enable SEOs and Sector-based Trainers (SBTs), who will be the main organizer of Sector-based CPD, so that they can thoroughly plan and implement it. Specific objectives are to

- stipulate and delegate roles and responsibilities of stakeholders
- guide SEOs and SBTs how to plan and implement Sector-based CPD sessions
- monitor Sector-based CPDs to reflect and improve the quality of implementation

Although this guideline is primarily for SBTs and SEOs, it also stipulates roles and responsibilities that DEOs and District Continuous Professional Development Committee (DCC) should bear in supervising the planning, implementing and monitoring Sector-based CPDs. It also helps HTs/DOS to understand the processes involved in preparing and implementing CPD activities.

The expected timeline to train all in-service teachers through Sector-based CPD is shown in the following table. All training sessions will be completed and practices to deepen CBC proficiency will be started by the end of the 2nd term. Readers of this guideline are required to conduct Sector-based CPD properly according to above timeline.

**Table 1-1 Overview of the timeline for Sector-based CPDs**

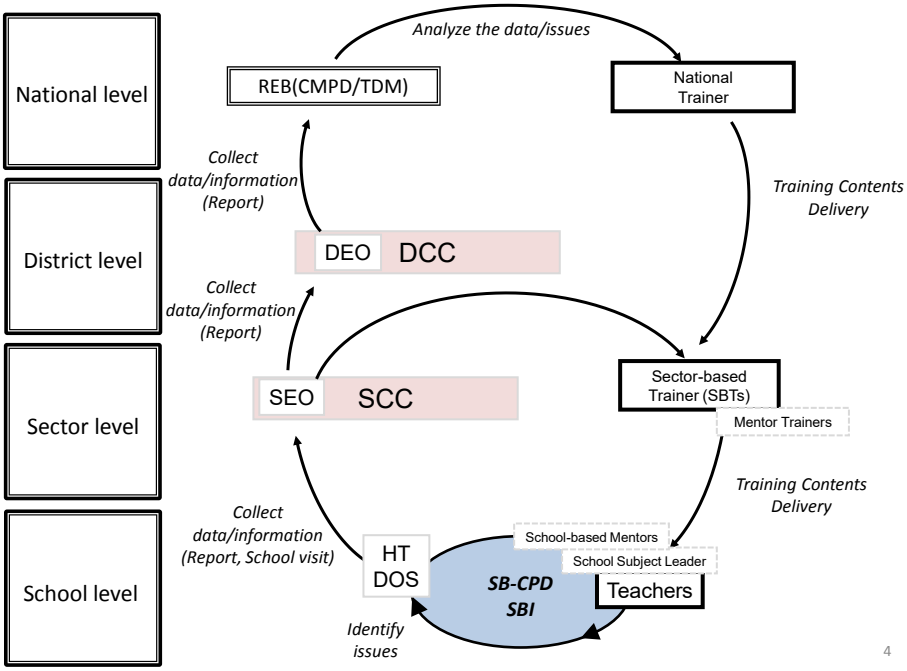
| | Activity | Key activity | Timeline |
|---|---|---|---|
| 0 | Training for SEOs | REB trains SEOs | Around mid-February |
| 1 | Orientation | Group formation<br>Preparation of Action Plan (scheduling) | By the end of February |
| 2 | Sector-based CPD | Implementation of Sector-based CPD | From March to July<br>All the contents should be finished by the end of 2nd Term |
| 3 | Review session | Report any unclear points and come up with Action Plan for Follow up activities | After the completion of Sector-based CPD |
| 4 | Follow up activities | Activities to address issues and challenges | After the completion of Sector-based CPD |

# 2. Concepts of Sector-based CPD for Competence-Based Curriculum

## 2.1 Conceptual Framework of CBC training

The introduction of a Competence-Based Curriculum (CBC) in schools calls for comprehensive change and new thinking with regard to instructional approaches in teaching, learning and assessment processes. Most teachers tend to teach using approaches through which they were taught. However, CBC requires teachers not only to deliver the knowledge but also to facilitate learners in their learning process to attain expected competencies intended in the curriculum. Therefore, they need to customize the lesson based on the different characteristics of each class and be reflective of their practices to constantly improve them.

In order to equip all teachers in service, problem solving cycle, as described in the figure below, will be applied. It consists of two streams, top-down stream for dissemination of training contents and bottom up stream for monitoring and evaluation (M&E). School-based CPD is located to connect these two streams. .




Top-down stream is to make sure that all teachers are trained in CBC. CBC training takes a unique approach. As shown in the right side of the diagram above, it applies a combination of cascading training and Continuous Professional Development (CPD). REB develops training contents and train National Trainers (NTs). NTs train Sector-Based Trainers (SBTs), who will train teachers in a series of Sector-based CPD sessions. Sector/School-based CPD will serve as a platform to continuously explore the best approaches to the learners in the sector. School-based Mentors (SBMs) also play an important role in this mechanism in supporting teachers especially in the area of medium of instruction.

When teachers face any challenges in applying what they learned in the training in the classroom, they will consult with SBMs and School Subject Leaders (SSLs) or report such challenges to HTs and DoS. If they cannot solve these challenges inside the school, challenges can be reported to SEOs. SEOs are encouraged take measures, for example, doing follow up trainings with SBTs. If challenges cannot be solved at the sector level, SEOs should report them

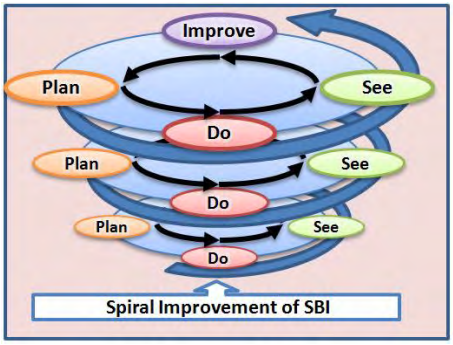
to DEOs. DEOs, together with newly established District CPD Committee members, make sure that all teachers in the district are trained and if teachers are facing challenges, DCC is expected to tackle these challenges at the district level. If any challenges cannot be solved at the district, they will be reported to REB. These challenges will inform REB to consider contents of the future trainings.

## 2.2 Rationale for Sector-based CPD in CBC training

Sector-based CPD engages all teachers in the standardized CBC training

Primary role of Sector-based CPD in CBC training is to engage all in-service teachers. Sector-based CPD is a good way to involve all teachers in an efficient and effective manner, because they don't have to sacrifice many classes to attend training and they can practice what they learned in the training in the class immediately after the training. All teachers will understand and master sufficient knowledge and skills needed for CBC implementation through a series of trainings. Measures to enable all teachers to attend Sector-based CPDs should be taken by SEOs, SBTs and HT/DoS (see 3 Planning and its Implementation of Sector-based CPD for details). Concept of Sector-based CPD is similar to what it used to be called as "S-SBI (Standardized-SBI)" in the CBC training first phase in 2015-2016.

CPD continuously improves CBC proficiency




Training at the sector level is the final stage of CBC training though it also is the beginning of Continuous Professional Development (CPD). CPD is a spiral improvement process which consists of Plan-Do-See-Improve (PDSI) to improve teachers' proficiency of CBC. CPD is a repeating practice, because teachers in CBC should always be reflective of their practices to constantly improve lessons. Sector/School-based CPD sessions will serve as this platform so that teachers can continuously explore the best approach for the learners in the sector. Through this process, good attitude as role model may be developed while they teach and learn together in Sector CPD groups as well.

School/Sector-based CPD generates new ideas of CBC practice with peer

In the CBC, the teacher is expected not only to deliver the knowledge, but also to facilitate the learners in their learning process to attain expected competencies intended in the curriculum. Cascade training provides common CBC ideas. However, to be a good facilitator, teachers need be able to customize the lesson based on the different characteristics of each class. School/Sector-based CPD allows teachers to learn with peers who work in similar situation, environment or context so that teachers can easily exchange ideas to invent the best T/L approach for students according to the context.

## 2.3 Stakeholders for the Sector-based CPD

### 2.3.1 Demarcation in CBC Training

As mentioned in 1. Introduction, the CBC training program will be cascaded to all teachers through Sector-based CPD sessions and continuous improvement cycle will take place at the sector and school level. REB is responsible in developing contents and training SBTs while Districts and Sectors make sure that all teachers are trained at the sector level and supervise their continuous improvement cycle based on different situation and environment in their locality.

**Table 2-1 Overall Demarcation in CBC Training**

| | |
|---|---|
| REB | ✓ Develop a training system which is able to disseminate contents to all teachers<br>✓ Develop training materials<br>✓ Train National Trainers (NTs) who trains Sector-based Trainers (SBTs)<br>✓ Develop a monitoring system that enables REB/District/Sectors to provide solutions to address challenges for the teachers |
| District (DCC/DEO) | ✓ Make sure that teachers in service in the district are trained through Sector-based CPD sessions<br>✓ Monitor and evaluate Sector-based CPD conducted in the district and take actions accordingly. |
| Sector (SEO) | ✓ Make sure that teachers in the sector are trained through the Sector-based CPDs<br>✓ Monitor and evaluate Sector-based CPDs and take actions accordingly |
| DPs | ✓ Support CBC training in a technical, managerial and financial manner<br>✓ Provide materials and expertise to NTs / SBTs |

### 2.3.2 Roles and Responsibilities Associated with Sector-based CPD

For Sector-based CPD to function as a platform to improve CBC practice, it is important that HT/DoS, SBT, SEO, DEO and DCC bear their responsibilities in different steps in the Sector-based CPD. The table below summarizes the responsibilities for each stakeholder.

**Table 2-2 Main responsibilities of stakeholders**

| | Teacher | HT/DOS | SBM | SSL | SBT | SEO | DEO | DCC |
|---|---|---|---|---|---|---|---|---|
| Preparation | | ✓ | | | ✓ | ✓ | | |
| Implementation | ✓ | ✓ | ✓ | ✓ | ✓ | | | |
| Review | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Follow-up | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Monitoring and Evaluation | | ✓ | | | ✓ | ✓ | ✓ | ✓ |

Specific roles and responsibilities associated with Sector-based CPD are described in the following table. SBT will play a central role in assuring the quality of Sector-based CPD. SEOs are expected to manage the Sector-based CPDs. School Subject Leader who were appointed in the previous phase of CBC training will be a resource person or a facilitator in the Sector-based CPD to provide subject specific expertise to the Sector CPD Groups. DCC through DEO oversees the situation of implementation of Sector-based CPDs in the district based on the reports from SEOs. In regards to the DCC, please also refer to the communication by REB to the all mayors on the Establishment and Rollout of District CPD Committees dated 29/07/2016 (ref: 1793/REB/TDM/2016).

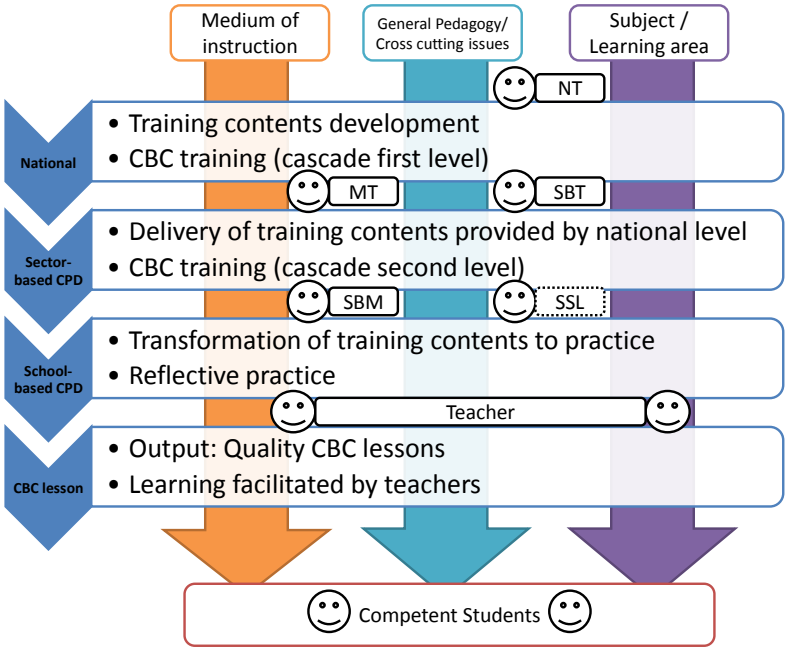
**Table 2-3 Roles and responsibilities of stakeholders**

| Stakeholder | Roles and responsibilities |
|---|---|
| Teachers | ✓ Make sure that they are part of the Sector CPD Group that they are supposed to join<br>✓ Check the schedule of Sector-based CPD sessions and report any difficulties in attending them if any<br>✓ Actively take part in Sector-based CPD activities<br>✓ Report their attendance to HT/DOS |

| | |
|---|---|
| | ✓ Share challenges and good practices with HT/DOS and SBTs |
| HT/DOS | ✓ Make sure that teachers in their school are involved in the Sector CPD Group that they are supposed to join<br>✓ Coordinate with SEOs and SBTs in developing schedule of Sector- based CPD sessions<br>✓ Assist SEOs and SBTs in planning and implementing Sector-based CPD by hosting some sessions and providing refreshment / materials if fund is available<br>✓ Report teachers' attendance to SEO/SBTs<br>✓ Share challenges and good practices with SEO/SBT |
| SBT | ✓ Be responsible in delivering the contents of the training that they attended at the training center to the teachers in the Sector CPD Group that SBTs are leading<br>✓ Follow up the Sector-based CPD sessions by organizing a review meeting to act on the challenges that teachers are facing and to ensure that all teachers in the Sector- CPD Group attain the required competencies |
| SBM | ✓ Coordinate School-based CPD activities.<br>✓ Share materials that they have with other teachers if appropriate<br>✓ Follow up the Sector-based CPD sessions by sharing challenges and good practices observed at the school level with SBTs |
| SEO | ✓ Make sure that teachers in the sector are trained in the Sector-based CPDs based on thorough planning and supervision<br>✓ Recommend SBTs to the district<br>✓ Compile action plans developed by each Sector- CPD Group, make the Action Plan for the Sector and submit to the DCC through DEO<br>✓ Act on challenges that are reported by the SBTs, HT/DOS and teachers and report any unsolved challenges to DCC through DEO |
| SSL | ✓ Play a role of resource person, especially in a subject area, by providing useful resources and facilitating CPD activities at sector and school level |
| DCC/DEO | ✓ Compile action plans submitted by the Sectors and develop an action plan for the district, consistent with the District Performance Contract.<br>✓ Nominate SBTs and other resource persons for the Sector-based CPDs<br>✓ Monitor and evaluate Sector- based CPDs conducted in the district.<br>✓ Evaluate SBTs and other resource persons for the Sector-based CPDs.<br>✓ Report any challenges that cannot be solved at the district level to REB |

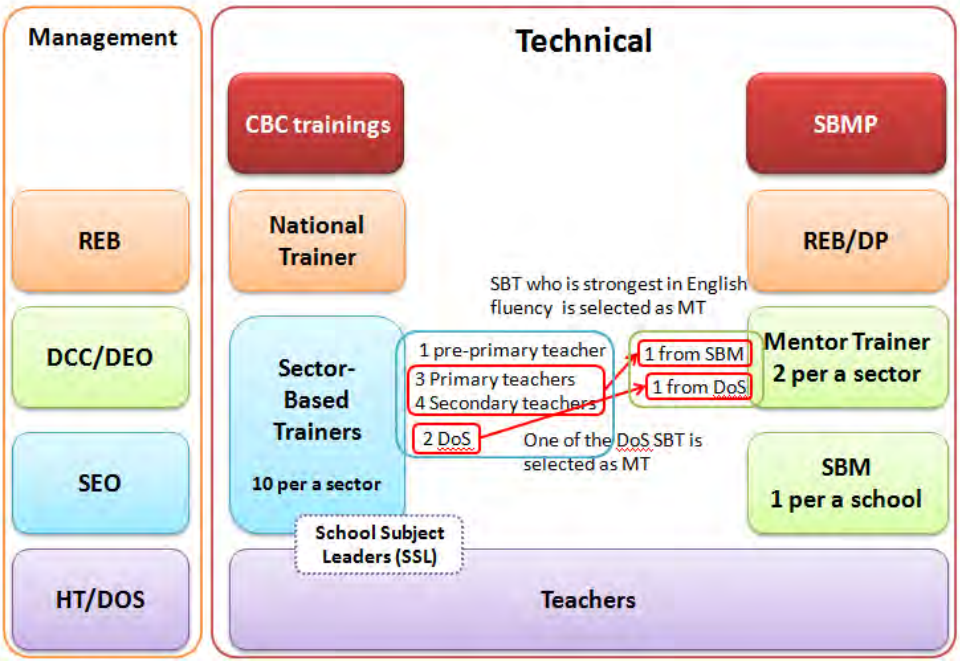
### 2.3.3 CBC Training and School-based Mentorship Programme (SBMP)

One School-based Mentor (SBM) per school has been nominated to support teachers' CPD especially in the areas of English language and pedagogy for competence-based teaching and learning. There will be two Mentor Trainers (MTs) per a sector too to train SBMs, one selected from SBMs and the other selected from DoS. MTs will be selected from SBTs. Please refer to the SBMP Framework as attached for the details about SBMP.




Box: How to nominate Mentor Trainers (MTs)
*For the effective coordination between the CBC Training and SBMP*

As explained in the SBMP Framework (attached), 2 Mentor Trainers (MTs) per a sector will be nominated to support activities conducted by SBMs. Because SBMs are expected to help teachers improve their English language skills as well as competence-based teaching and learning, MTs should also be capable of helping SBMs in CBC. SBTs have already been trained by National Trainers in CBC, therefore, districts and sectors are expected to select MTs from the group of SBTs. SBT who is strongest in English fluency should be selected as MT. One of the DoS SBT will also play a role of MT.



# 3. Planning and its Implementation of Sector-based CPD sessions

## 3.1 Overview of the Sector-based CPD Process

As described in previous chapter, Sector-based CPD follows PDSI cycle and the cycle can be interpreted into the steps below.

**Table 3-1 PDSI Cycle of Sector-based CPD**

| Cycle | Steps | Quick Check Points |
|---|---|---|
| Plan | 1. Sector CPD Group formation (Annex 1) | Thorough group formation ensures active communication among teachers.<br>✓ Appropriate number of members<br>✓ Similar background (teaching grade, subject)<br>✓ Access to venue of Sector-based CPD sessions from home/school |
| | 2. Action planning (Annex 2) | Clarify what to prepare for Sector-based CPD<br>✓ Is venue (training center) available?<br>✓ Can all group members attend with planned schedule? (no overlap with other events?)<br>✓ Can all the training contents be covered in schedule?<br>✓ Is a trainer (and/or a resource person) assigned? |
| Do | 3. Sector-based CPD sessions | ✓ Necessary logistics (i.e. preparation of materials) are done prior to Sector-based CPD?<br>✓ Did all teachers in the Sector- CPD group attend?<br>✓ Were all the contents in the plan covered? |
| See | 4. Review session | After the completion of all training, teachers will apply what they learned in the training and then;<br>✓ Were there any unclear points or challenges for CBC lesson?<br>✓ What can be the solution to address above issues?<br>✓ Any good practice to be shared? |
| Improve | 5. Follow-up activities | Solutions discussed in review session should be examined.<br>✓ How does the solution work? (Lesson observation can be held)<br>✓ Further issues raised? |

## 3.2 Preparation of Sector-based CPD

### 3.2.1 Orientation at the Sector level

In order to plan Sector-based CPD sessions effectively, it is highly recommended to organize an orientation at the sector level for all teachers to form the Sector CPD groups and to develop Action Plans.

#### (1) Purpose of the Orientation

After SBT training (16-21 January, 2017) at the training centers, SEOs, in cooperation with SBTs, should organize an orientation for all the teachers in the sector. The purpose of the orientation is twofold.

(a) to form Sector- CPD Groups and assign an SBT to each group
(b) to set the schedule for each Sector CPD Group for the coming months

#### (2) Participants to the Orientation

The orientation should involve all teachers (including HTs and DoS) and all the SBTs in the sector. SEOs are expected to coordinate with HTs to set a schedule for the orientation that is convenient for all the teachers as much as possible.

### (3) Venue of the Orientation

The venue of the orientation should be decided by the SEO. Note that the venue should be big enough to host all the teachers in the sector. It would be preferable to have classrooms available where Sector CPD Groups can have breakout sessions to set up the schedule.

### (4) Programme of Orientation

The orientation consists of three parts; a) Introduction by the SEO, b) Sector CPD Group Formation and c) Preparation of Action Plan. Following sections explain the contents that should be covered in each part.

a) Introduction by the SEO

Firstly, SEO should give an introduction to the teachers. In the introduction, SEO is expected to talk about the following points.

- Purpose of Sector-based CPD: to train teachers to be competent in facilitate learning according to the CBC.
- Overall schedule of the Sector-based CPD sessions: teachers will go through a series of Sector-based CPDs in the coming months. Sector-based CPD sessions may take place over the weekend
- Contents of Sector-based CPD sessions: SEO can briefly explain the contents to be covered in the Sector-based CPD sessions. Contents are listed in the Annex 2.
- Ask for HTs' facilitation to conduct Sector-based CPD: HTs are expected to facilitate the implementation of the Sector-based CPD by (1) hosting some sessions in their school, (2) coordinating the schedule with school events, (3) availing SBTs for leading the planning and implementation of Sector-based CPD, and (4) availing capitation grant for Sector-based CPD

b) Sector CPD Group Formation

Secondly, SEO will coordinate the grouping process. The following is the principle in forming Sector CPD Group. However, because the situation is different sector to sector, SEOs and SBTs are expected to adjust the group formation according to the situation in the sector.

**Principles for forming Sector CPD Groups**

- An Sector CPD Group consists of teachers teaching the same level and same learning area.
- The preferable number of teachers in a group is more than 5 and less than 20. If it exceeds 20, the group can be divided into 2. If the members are less than 4, they can merge other group of the same learning area for the different level, if that group is not too big.
- SBT is the leader of the Sector CPD Group. SEO should assign SBTs based on the subject(s) they are teaching. However, there are only 10 SBTs[1] and they don't necessarily cover all the learning areas for all the levels. In that case, SBTs can invite a resource person (e.g. a senior teacher, TTC lecturer, etc), especially for the sessions which deal with subject contents, for example, Writing Scheme of Work (Session 3.2 in the Annex 2), Writing Lesson Plans (Session 4.5) and Using T&L materials (Session 4.6).
- If a teacher teaches several levels, for instance, lower secondary and upper secondary, he/she doesn't have to attend two groups because the contents are same except Writing Scheme of Work (Session 3.2 in the Annex), Writing Lesson Plans (Session 4.5) and Using T&L materials (Session 4.6). However, it would be useful for that teacher to get sample scheme of work, lesson plan and T&L materials from their colleagues attending the other group.

[1] 1 pre-primary, 3 primary, 4 secondary and 2 DoS according to the communication by REB to mayors dated 27/10/2016, N. 3493/REB/TDM/2016

The sample grouping for Sector-based- CPD is described in the following table.

**Table 3-2 Sample Sector CPD Groups**

| Learning area | Languages | Humanities | Math | Science & ICT |
|---|---|---|---|---|
| Pre-primary | Pre-primary Group | | | |
| Lower Primary | LP Language Group | LP Humanities Group | LP Math Group | LP Science & ICT Group |
| Upper Primary | UP Language Group | UP Humanities Group | UP Math Group | UP Science & ICT Group |
| Lower Secondary | LS Language Group | LS Humanities Group | LS Math Group | LS Science & ICT Group |
| Upper Secondary | US Language Group | US Humanities Group | US Math Group | US Science & ICT Group |

When Sector CPD Groups are formed, each group should fill Member List for Sector CPD Group (Annex 1) and submit to SEO.

c) Preparation of an Action Plan

Lastly, SBTs will bring teachers in his/her Group together to set a schedule for the Sector-based CPD sessions. The contents that should be covered in the Sector-based sessions are broadly divided into 5 areas; 1) Understanding the Syllabus, 2) Pedagogy, 3) Scheme of Work, 4) Lesson Plans and 5) General Skills. The full list is on the Annex 2.

SBT and the members will then set the schedule for each session and fill the Action Plan (Annex 2). It is preferable to organize Sector-based CPD sessions when they don't have classes in order not to sacrifice the lessons. SBTs are expected to coordinate with HTs and SEOs to ensure a venue for the Sector-based CPD sessions. Teachers should check the schedule for the school events and make sure that they can attend all Sector- based CPD sessions. If the schedule overlaps, teachers should report it to the SBTs.

After completing the Action Plan, SBT should submit the plan to SEO, who should sign to confirm the receipt. It is preferable that the all the sessions will be finished by June 2017..

#### (5) Compilation of Action Plan and Submission to the DCC

SEO should compile the action plans submitted by the SBTs and make an action plan for the Sector. This information will be submitted through online monitoring, whose form will be provided later. A copy should be given to DCC so that DCC can supervise the implementation status of the Sector-based CPDs at the sector level.

## 3.3 Implementation of Sector-based CPD (CBC training at sector)

Members of Sector CPD Group implement Sector-based CPD sessions according to the developed action plan.

### 3.3.1 Logistical preparation

Prior to the Sector-based CPD sessions, SEOs and SBTs are requested to confirm specific responsibility of each member of the Group in implementing the Action Plan. Holding a regular meeting or communication though phone, email and SMS is a good way to check the status of logistics work for implementation. You do not have to follow original plan strictly, Action Plan can be modified if you identify problems or difficulties in this process. You are recommended to communicate with supervisors (HT, DoS and DEO) so that necessary support can be

provided. If you have question about Sector- based CPD or whole CBC training process, you may contact REB staff too.

### 3.3.2 Facilitating Sector-based CPD

SBTs are required to conduct Sector-based CPD according to the given session plan and timeframe defined by your Action Plan. You should also recall facilitation skills inducted through this CBC training (See session 5.7 Facilitation skills). As repeatedly explained, Sector-based CPD aims to provide opportunities learning from peer, SBTs are expected to utilize such facilitation skills boost active interaction among group members.

### 3.3.3 Resources for Sector-based CPD

Teacher Training Manual was distributed to the SBTs in the SBT training. SBTs are expected to use these Manuals when conducting the Sector-based CPD sessions. They can also use materials which are available on Teacher Community of Practice (TCOP; https://www.tcop.rw/) and use the community forum on the same website to share good practices and learn from them.

## 3.4 Further Improvement of CBC proficiency

All teachers should be able to apply new T/L methodologies that they learned in the Sector-based CPD sessions properly in their classroom. SBTs are mandated not only to deliver the training contents, but also to ensure that all teachers in their Sector CPD group become competent.

Most people believe training ends when all training contents are taught. However, as you can refer the spiral PDSI cycle diagram, CPD continues even after completing the Action Plan. Reviews and follow-up activities are highly valued in entire CPD process.

TEMP/REB will remind DCC (DEOs) and SEOs to organize these reviews and follow-ups at appropriate timing identified through monitoring and progress of CBC lessons. SEOs and SBTs are then expected to lead the review session and follow-up activities as well, so that teachers are kept engaged in the CPD process. Review and follow up are the key in ensuring that teachers become proficient in CBC.

### 3.4.1 Review session

After completing the series of Sector-based CPD in the Action Plan, teachers will practice what they learned in the training. It is anticipated that the teachers face various issues and challenges in classroom when applying given T/L methodologies due to premature understanding and mastery on training contents. Or a certain situation and environment in some schools may not allow teachers to apply such new methodologies.

Review session is the opportunity to share and to report such issues, challenges and unclear points on CBC implementation. SEOs and SBTs are requested to facilitate the discussion to guide Sector CPD group members on the right track.

Issues and challenges derived from premature understanding and mastery on training contents should be solved within the Sector CPD group in cooperation with sector and schools. Giving supplementary sessions by SBT, lesson observations and peer material developments are the possible measures/solutions. Sharing good practices among group members could also inspire solutions.

SEOs and SBTs are expected to plan and facilitate such activities as follow-up activities. Developing such plan for follow-up activities should be included in this review session as well.

Among the issues and challenges the teachers have, those issues that are difficult to find measures/solutions by sector / schools should be reported to DCC (DEOs) and TEMP/REB.

### 3.4.2 Follow-up activities

After the review session, follow-up activities should be conducted according to the action plan developed in review session. SEOs and SBTs should lead and facilitate planning and implementation of follow up activities. Follow up activities can take place at the sector or at the school. It is important to plan follow-up activities in a way that is feasible and is effective in generating the expected impact. Combination of various T/L improvement activities, like those introduced in review session section, can accelerate the mastery of CBC. Series of lesson observation in group members is the excellent idea so that teachers in the group can easily develop their mutual understanding. Resource persons other than SBTs, such as Mentor Trainers (MTs), School-Based Mentors (SBMs) and School Subject Leaders (SSL), are expected to play a role of resource persons in the follow-up activities, by facilitating sessions and providing expertise.

These activities are quite similar to the original School-Based INSET. If your school has already started SBI at school level, you may unite SBIs – Sector/School CPD together.

# 4. Other related issues of Sector-based CPD

## 4.1 Monitoring and Evaluation

**Detailed monitoring system and structure and tools will be finalized by referring the current situation and progress of Sector-based CPD. Thus details will be communicated later.*

Sector-based CPD in Rwanda, as you have seen in this guideline, is designed by considering the following points well to ensure that all teachers in Rwanda become competent.

- ✓ Delivering the same CBC training contents across the country
- ✓ Engaging all teachers in CBC training
- ✓ Provide all teachers opportunities for Continuous Professional Development (CPD)

Hence the main focus of monitoring and evaluation (M&E) for Sector-based CPD will be designed to study the above points. The below table summarize the major M&E points.

**Table 4-1 Summary of M&E Areas and Points**

| M&E Areas | M&E points |
|---|---|
| Delivery of contents | ✓ All contents are taught as expected?<br>✓ All SBTs present?<br>✓ All training centers are prepared? |
| Engagement in CBC training (Sector-based CPD sessions) | ✓ All teachers participated?<br>✓ Degree of understanding of teachers<br>✓ What issues and challenges are raised in review?<br>✓ What measures/solutions proposed? |
| Engagement in CPD (Follow-ups and School-based CPD) | ✓ All teachers participated?<br>✓ What activities are conducted?<br>✓ What issues and challenges are raised?<br>✓ What good practices are generated though School-based CPD activities? |

As issues and challenges in Sector-based CPD are raised along with the context of CBC training, these may be linked to CBC issues. Thus this M&E process covers a part of CBC monitoring itself (Findings should be feedback to CPMD/REB as well)

## 4.2 Measures for Absent Teachers

CBC training is a mandatory for all in-service teachers in Rwandan schools which implement CBC. No teacher is allowed to absent from this training. This training is cascaded to sectors to reduce the burden of teachers accessing to the training. Districts, sectors and schools are expected to provide full support for all teachers to attend the trainings.

Meanwhile, if teachers cannot attend the trainings with some unavoidable reasons, districts, sectors and schools are expected to consider alternative trainings for absentees to assure quality of lessons in your districts, sectors and schools.

Training of absentee teachers by fellow teachers in the same schools can be the one of the efficient solutions.

## Member List for Sector CPD Group

Name of the Group: _____

Name of SBT: _____

Date: _____

| # | Name | Subject | Grade | Affiliation (School) | Phone |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |

Name of SEO: _____

Date: _____

## Action Plan for Sector-based CPD Sessions

Name of the Group: _____

Name of SBT: _____

Date: _____

| Learning Area | Sessions | Schedule (Day/Time) | Venue |
|---|---|---|---|
| 0. Orientation | 0.1 Development of Action Plan (this session) | | |
| 1.Understanding the Syllabus | 1.1 Understanding the Syllabus | | |
| | 1.2 Competences | | |
| | 1.3 Cross-Cutting Issues | | |
| 2. Pedagogy | 2.1 Facilitating Inclusive Classrooms | | |
| | 2.2 Praise & Error Correction | | |
| | 2.3 Using Games and Songs | | |
| | 2.4 Managing Large Classes | | |
| | 2.5 Making and Gathering T&L Materials | | |
| | 2.6 Using Texts/Books in the Classroom | | |
| | 2.7 Integrating ICT and Digital Materials in the Class | | |
| 3. Developing Scheme of Work | 3.1 Using Syllabi in Developing Scheme of Work | | |
| | 3.2 Writing a Scheme of Work | | |
| 4. Developing Lesson Plans | 4.1 Why Lesson Plan | | |
| | 4.2 Writing Instructional Objectives | | |
| | 4.3 Sequencing Activities | | |
| | 4.4 Integrating Cross Cutting Issues & Generic Competences | | |
| | 4.5 Writing Lesson Plans | | |
| | 4.6 Using T&L Materials | | |
| 5. General Skills | 5.1 Understanding ICT Concepts | | |
| | 5.2 Computers and Internet | | |
| | 5.3 Integration of ICT in Teaching & Learning | | |
| | 5.4 Introduction to Assessment | | |
| | 5.5 Assessment Techniques (formative & summative) | | |
| | 5.6 Using Assessment Data | | |
| | 5.7 Facilitation Skills | | |
| | 5.8 Giving/Receiving Feedback | | |
| 6. Review session | 6. Review of the Sector-based CPDs | | |

Name of SEO: _____

Date: _____

# Appendix 11. DCC/SCC Monitoring Forms

# DCC monitoring tool

## I. DCC management and planning

*(Under this section, provide information related to the DCC committee meetings and its planning).*

1) How often did the DCC meetings happen last term in your district?

| | | | |
|---|---|---|---|
| Once | Twice | Three times or more | Never |

2) If the meetings happened, what were the points of discussion?

| |
|---|
| |

3) If never, why? and what can be done to ensure DCC meetings are always conducted?

| |
|---|
| |

4) Is there any evidence of DCC meetings for the last term such as minutes?

| | | |
|---|---|---|
| Yes | No | No meeting was held |

5) If yes, please upload supporting documents.

6) If no, why? and what can be done to always have evidences of DCC meetings?

| |
|---|
| |

7) Does your DCC have an action plan? (annual action plan, termly action plan etc.)

| | | |
|---|---|---|
| Yes | Still in process | No |

8) If still in process, what is the problem? and when will it be complete?

| |
|---|
| |

9) If no, why? and what can be done to enable the DCC to develop an action plan?

| |
|---|
| |

10) Are CPD activities integrated in district annual action plans?

| | |
|---|---|
| Yes | No |

11) If no, why? and what can be done to include them in the district annual action plans?

| |
|---|
| |

12) Are CPD activities integrated into your annual district performance contracts (Imihigo)?

| | |
|---|---|
| Yes | No |

13) If no, why? and what can be done to include them in your annual district performance contracts (Imihigo)?

| |
|---|
| |

14) What were the challenges that you faced while conducting DCC meetings?

| |
|---|
| |

15) What can be done to solve the challenges that you faced while conducting DCC meetings?

| |
|---|
| |

16) Did your DCC conduct a CPD needs assessment(s) last term?

| Yes | No |
|---|---|

17) If yes, please provide a summary of the results of the needs assessment(s).

| |
|---|
| |

18) If no, why?

| |
|---|
| |

19) there reporting mechanisms between SCCs in your district and your DCC?

| Yes | No | Other (specify) |
|---|---|---|

20) What can be done to improve the reporting mechanisms between SCCs and your DCC?

| |
|---|
| |

## II. Implementation of DCC activities

*(Under this section, provide information related to the implementation of your DCC's activities).*

1) How many times did your DCC organize CPD activities at district level last term?

| Once | Twice | Three times or more | Never |
|---|---|---|---|

2) If they happened, list CPD activities conducted by your DCC at district level last term.

| Title of CPD activity | Venue | Number of days | Target people | Number of participants | Brief description of CPD activity |
|---|---|---|---|---|---|
| | | | | M : /F: | |
| | | | | M : /F: | |
| | | | | M : /F: | |
| | | | | M : /F: | |

3) Is there any evidence of CPD activities at district level for the last term such as reports or photos?

| Yes | No | No activity was held |
|---|---|---|

4) If yes, please upload supporting documents.

5) If no, why? and what can be done to always have evidences of CPD activities?

| |
|---|
| |

6) Provide information related to CPD activities that were conducted in your district by development partners last term.

| Name of development partner | Venue | Number of days | Target people | Number of participants | Brief description of the capacity building activities | To what extent is this activity linked to your CPD needs? |
|---|---|---|---|---|---|---|
| | | | | M : /F: | | - Extremely<br>- Moderately<br>- Not at all |
| | | | | M : /F: | | - Extremely<br>- Moderately<br>- Not at all |
| | | | | M : /F: | | - Extremely<br>- Moderately<br>- Not at all |
| | | | | M : /F: | | - Extremely<br>- Moderately<br>- Not at all |

**III. Monitoring and evaluation of CPD**

*(Under this section, you will be able to provide information related to monitoring and evaluation of CPD activities in your DCC).*

1) If you conducted CPD activities, please list challenges you faced during implementation.

| |
|---|
| |

2) What can be done to address the challenges mentioned above?

| |
|---|
| |

3) How many times did the DCC or any of DCC members conduct school visits related to implementation of DCC resolutions last term?

| | | | |
|---|---|---|---|
| Once | Twice | Three times or more | Never |

4) If never, why? and what can be done to enable the DCC or any of DCC members to conduct school visits?

| |
|---|
| |

5) List any good practices from CPD implementation at district, sector and school levels last term as a result of DCC resolutions (teaching and learning, school leadership and community involvement……)?

| |
|---|
| |

6) In your role of monitoring CPD activities at sector and school levels, are there areas that need improvement?

| | |
|---|---|
| Yes | No |

7) If yes, mention those areas and what can be done to improve them?

| |
|---|
| |

## IV. Feedback

*(Under this section, REB would love to hear from you about what you think should be done to improve on the work of DCC in your district).*

1) Is there anything you would like to consult with REB about in relation to DCC or CPD activities in your district?

| |
|---|
| |

2) What kind of technical assistance is needed from MINEDUC, REB and development partners to better implement DCC activities in your district?

| |
|---|
| |

3) Any other comments

| |
|---|
| |

## SCC monitoring tool

### I. SCC management and planning

*(Under this section, provide information related to the SCC committee meetings and its planning).*

1) How often did the SCC meetings happen last term in your sector?

| | | | |
|---|---|---|---|
| Once | Twice | Three times or more | Never |

2) If the meetings happened, what were the points of discussion?

| |
|---|
| |

3) If never, why? and what can be done to ensure DCC meetings are always conducted?

| |
|---|
| |

4) Is there any evidence (e.g. minutes, photos……..) of SCC meetings for the last term?

| | | |
|---|---|---|
| Yes | No | No meeting was held |

5) If yes, please upload supporting documents.

6) If no, why? and what can be done to always have evidences of SCC meetings?

| |
|---|
| |

7) Does your SCC have an action plan? (annual action plan, termly action plan etc.)

| | | |
|---|---|---|
| Yes | Still in process | No |

8) If still in process, what is the problem? and when will it be complete?

| |
|---|
| |

9) If no, why? and what can be done to enable the SCC to develop an action plan?

| |
|---|
| |

10) Are CPD activities integrated in sector annual action plans?

| | |
|---|---|
| Yes | No |

11) If no, why? and what can be done to include them in the sector annual action plans?

| |
|---|
| |

12) Are CPD activities integrated into your annual sector performance contracts (Imihigo)?

| | |
|---|---|
| Yes | No |

13) If no, why? and what can be done to include them in your annual sector performance contracts (Imihigo)?

| |
|---|
| |

14) What were the challenges that you faced while conducting SCC meetings?

| |
|---|
| |

15) What can be done to solve the challenges that you faced while conducting SCC meetings?

| |
|---|
| |

16) Did your SCC conduct a CPD need assessment last term?

| Yes | No |
|---|---|

17) If yes, please provide a summary of the results of the needs assessment.

| |
|---|
| |

18) If no, why?

| |
|---|
| |

19) Are there reporting mechanisms between schools in your sector and your SCC?

| Yes | No | Other (specify) |
|---|---|---|

20) What can be done to improve the reporting mechanisms between schools in your sector and your SCC?

| |
|---|
| |

21) How often did you report SCC activities to the DCC?

| Never | Monthly | Termly | Other (specify) |
|---|---|---|---|

22) How often did schools report CPD activities to your SCC last term?

| Frequency | Number of school(s) | School name(s) |
|---|---|---|
| Never | school(s) | |
| Monthly | school(s) | |
| Termly | school(s) | |
| Other (specify) | school(s) | |

## II. Implementation of SCC activities

*(Under this section, provide information related to the implementation of your SCC's activities).*

1) How many times did your SCC organize CPD activities at sector level last term?

| | | | |
|---|---|---|---|
| Once | Twice | Three times or more | Never |

2) If they happened, list CPD activities conducted by your SCC at sector level last term.

| Title of CPD activity | Venue | Number of days | Target people | Number of participants | Brief description of CPD activity |
|---|---|---|---|---|---|
| | | | | M : /F: | |
| | | | | M : /F: | |
| | | | | M : /F: | |
| | | | | M : /F: | |

3) Is there any evidence (e.g. reports, photos……) of CPD activities at sector level for the last term?

| | | |
|---|---|---|
| Yes | No | No activity was held |

4) If yes, please upload supporting documents.

5) If no, why? and what can be done to always have evidences of CPD activities?

| |
|---|
| |

6) Provide information related to CPD activities that were conducted in your sector by development partners last term.

| Name of development partner | Venue | Number of days | Target people | Number of participants | Brief description of the capacity building activities | To what extent is this activity linked to your CPD needs? |
|---|---|---|---|---|---|---|
| | | | | M : /F: | | - Extremely<br>- Moderately<br>- Not at all |
| | | | | M : /F: | | - Extremely<br>- Moderately<br>- Not at all |
| | | | | M : /F: | | - Extremely<br>- Moderately<br>- Not at all |
| | | | | M : /F: | | - Extremely<br>- Moderately<br>- Not at all |

## III. Monitoring and evaluation of CPD & review and learning

*(Under this section, you will be able to provide information related to monitoring and evaluation of CPD activities in your SCC).*

1) If you conducted CPD activities, please list challenges you faced during implementation.

| |
|---|
| |

2) What can be done to address the challenges mentioned above?

| |
|---|
| |

3) Specify the names and number of schools that fall under each of the following categories in your sector.

| Category | Number of school(s) | Name of school(s) |
|---|---|---|
| Schools that have CPD plans | school(s) | |
| Schools that are in process of developing CPD plans | school(s) | |
| Schools that don't have CPD plans | school(s) | |
| Don't know | school(s) | |

4) What can be done to enable all of them to have action plans?

| |
|---|
| |

5) For each of the following categories, specify the names and number of schools in your sector that include CPD activities into their timetables.

| Category | Number of school(s) | Name of school(s) |
|---|---|---|
| Schools that include CPD activities into their timetables | school(s) | |
| Schools that do not include CPD activities into their timetables | school(s) | |
| Don't know | school(s) | |

6) How many times did the SCC or any of SCC members conduct school visits related to implementation of SCC resolutions last term?

| Once | Twice | Three times or more | Never |
|---|---|---|---|
| | | | |

7) If never, why? and what can be done to enable the SCC or any of SCC members to conduct school visits.

| |
|---|
| |

8) What types of CPD activities were implemented by schools in your sector last term?

| Type of CPD activities | Number of school(s) | Names of school(s) |
|---|---|---|
| School Based In-service Training | | |
| Mentorship program | | |
| Community of Practice | | |
| Professional Learning Communities | | |
| Peer Learning | | |
| Self Study | | |
| Lesson Study | | |
| Other (specify) | | |

9) What types of School-based in Service Trainings did schools in your sector conduct last term?

| Type of School Based in Service Training | Number of school(s) | Names of school(s) |
|---|---|---|
| Model lessons | | |
| Best practices | | |
| Addressing challenges | | |
| Others (specify) | | |

10) What types of Mentorship activity did schools in your sector conduct last term?

| Mentorship activity | Number of school(s) | Names of school(s) |
|---|---|---|
| English | | |
| Teaching methodology | | |
| Others (specify) | | |

11) What types of peer learning did schools in your sector conduct last term?

| Title of peer learning activity | Venue | Number of days | Number of participants | Brief description of peer learning activity |
|---|---|---|---|---|
| School by school | | | M : /F: | |
| | | | M : /F: | |
| | | | M : /F: | |
| Teacher (s) by teacher (s) | | | M : /F: | |
| | | | M : /F: | |
| | | | M : /F: | |
| Student (s) by student (s) | | | M : /F: | |
| | | | M : /F: | |
| | | | M : /F: | |
| Others (specify) | | | M : /F: | |
| | | | M : /F: | |
| | | | M : /F: | |

12) What kind of resourceful materials were used in conducting different CPD activities?

| |
|---|
| |

13) List any good practices from CPD implementation at sector and school levels last term as a result of SCC resolutions (teaching and learning, school leadership and community involvement…….)?

| |
|---|
| |

14) In your role of monitoring CPD activities at school level, are there areas that need improvement?

| Yes | No |
|---|---|

15) If yes, mention those areas and what can be done to improve them?

| |
|---|
| |

16) Did your SCC provide feedback on CPD implementation to schools last term?

| Yes | No | No monitoring was held |
|---|---|---|

17) If no, why? and what can be done to enable the SCC to always give feedback to schools?

| |
|---|
| |

## IV. Feedback

*(Under this section, REB would love to hear from you about what you think should be done to improve on the work of SCC in your sector).*

1) Is there anything you would like to consult with REB about in relation to SCC or CPD activities in your sector?

| |
|---|
| |

2) What kind of technical assistance is needed from MINEDUC, REB and development partners to better implement SCC activities in your sector?

| |
|---|
| |

3) Any other comments

| |
|---|
| |

# Appendix 12. DCC/SCC Quarterly Monitoring Report (1st Quarter of 2019)

**DCC/SCC QUARTERLY MONITORING REPORT**

**PERIOD: 1ST QUARTER OF 2019**

**DATE: 23rd – 29th APRIL**

## I. Introduction

In July 2016, REB requested districts and sectors to establish District CPD Committees (DCCs) and Sector CPD Committees (SCCs) in order to coordinate and support CPD which can maximize efficiency and effectiveness of teaching and learning.

Now that main phase of CBC induction program in 2015/16 to 2017/18 is over, the importance of school-based CPD has increased for teachers to continuously improve their lessons.

Furthermore, the government embarked on strengthening CPD by setting it as Strategic Priority 2 of the ESSP 2018/19-2022/23, formulating National Teacher CPD Framework and having decided at a cabinet meeting that engagement in CPD shall be considered in advancing teachers' career path.

Effective monitoring system is now required for strengthening problem-solving cycle from school to national level. To this end, Teacher Training Unit (TTU) of the REB TDM&CGC Department in cooperation with JICA SIIQS Project developed the "concept note for monthly and quarterly DCC/SCC monitoring".

Pursuant to the concept note, a monitoring team composed of TTU staff and JICA SIIQS Project team members conducted DCC/SCC quarterly monitoring visits for the first quarter of 2019 to investigate their operation status, good practices and challenges. Quarterly monitoring visits were conducted in three districts, namely, Rulindo, Kirehe and Gisagara. These visits were intended to collect qualitative information, which can supplement monthly monitoring that was piloted in these districts in the form of monthly report before approval of the concept note, and to contribute to better understanding of DCC/SCC status in these areas.

This monitoring report mainly compiles monitoring data from the quarterly monitoring with supplementary information from monthly monitoring. The findings in this report will serve in decision-making for both REB and DCCs/SCCs.

## II. Background (Findings from an analysis of need assessment survey for the CBC training in 2018/19)

### 1. Preliminary study

School-based CPD is a cost-effective way of teacher professional development (Iwasaki et al., in press) and effective in improving students engagement in the class (Yoshikawa et al., 2015) and academic achievement (REB, 2015) in Rwanda.

As background information of circumstances surrounding teachers' CPD, the Project analyzed online questionnaires to teachers and SEOs which were collected in March 2019 during the need assessment survey for CBC training. The table below shows sample size. Teachers and SEOs were sampled from all 30 districts.

**Table 1 Sample size of the online questionnaire**

| Target group | Sample size | Coverage |
|---|---|---|
| Teachers | 4,178 | 6.0% |
| Head teachers | 497 | 11.2% |
| SEOs | 87 | 20.9% |

In the questionnaire, teachers were asked how frequently they attended school-based CPD in 2018. If the answer was "never", they described the reason why. Similarly, SEOs were asked to describe the challenges around CPD. Both were open ended question. Text mining[1] was applied to responses to these questions in order to understand obstacles of CPD.

### 2. Findings

Out of 414 primary and secondary teachers who never attended school-based CPD, 389 valid responses were gathered. 39 morphemes with high frequency were used to draw co-occurrence network diagram (Figure 1). Morphemes with higher frequency are indicated as bigger circle. Words were automatically grouped and separated by color.

[1] Text mining helps objectively identify words ("morphemes", the smallest meaningful unit of language) of frequent appearance and visualize intensity of their relationship by classifying them into groups ("communities").

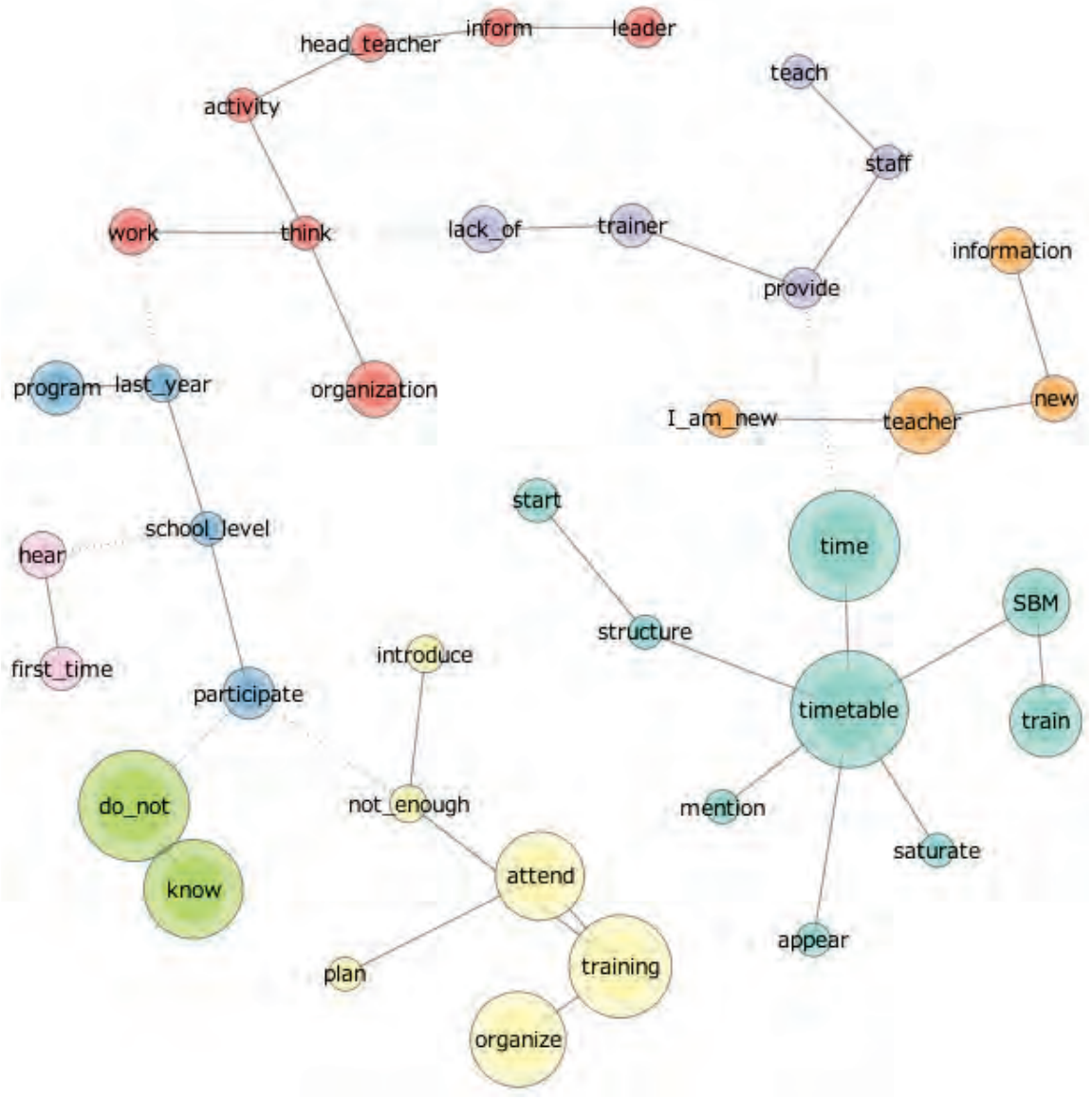



**Figure 1 Co-occurrence network diagram of teachers' answers**

In this analysis, eight groups were extracted which could be named as follows.

1. Time/timetable
2. Trainers
3. Head teacher/school leadership
4. New teacher
5. Awareness 1 (no knowledge)
6. Awareness 2 (first time to hear)
7. Not planned, organized or introduced
8. Attended last year

As for SEOs, 120 valid responses were also analyzed in the same manner. 30 morphemes with high frequency were used to draw co-occurrence network diagrams (Figure 2).

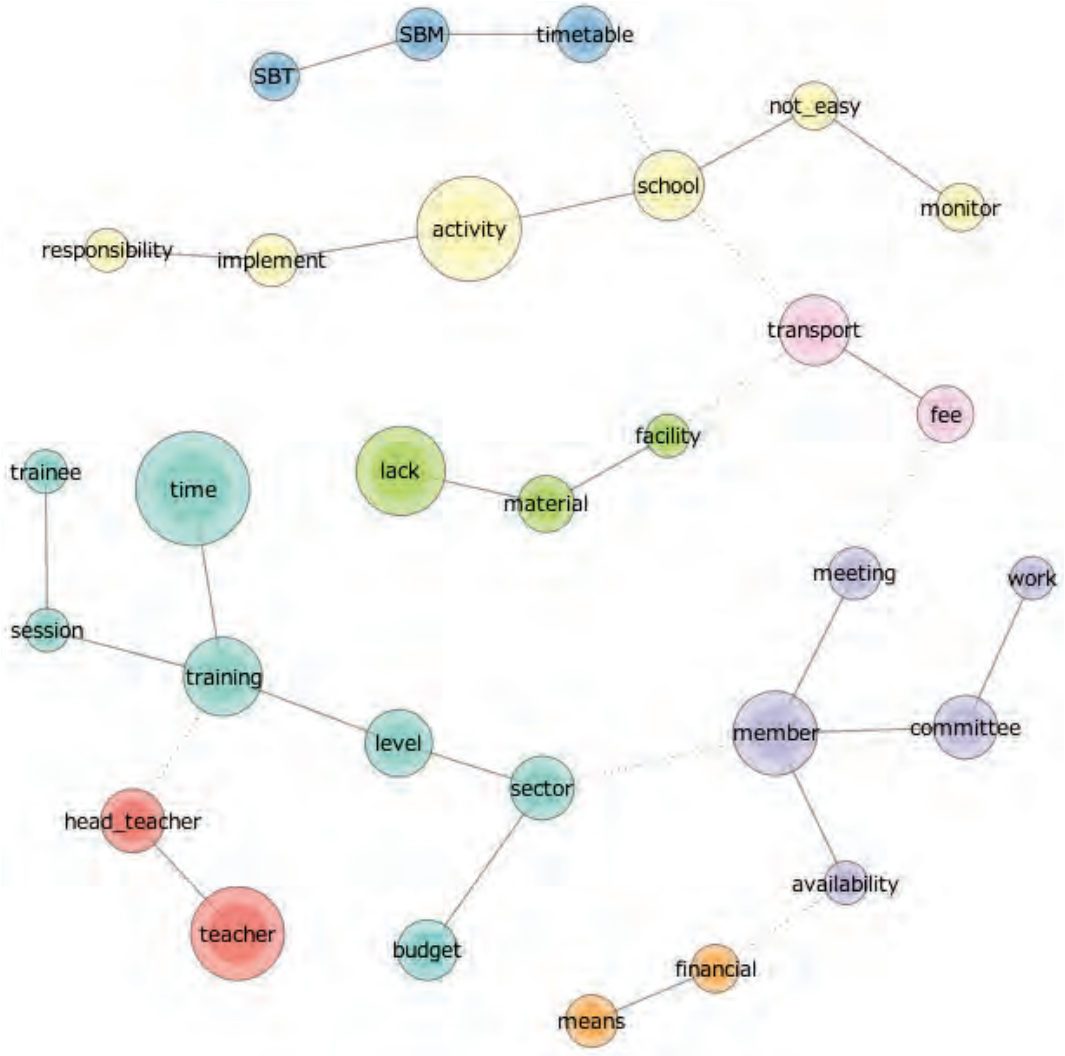



**Figure 2 Co-occurrence network diagram of SEOs' answers**

In this analysis, eight groups were extracted which could be named as follows.

1. Time and budget
2. Financial means
3. Head teacher
4. Resource persons' timetable
5. Difficulties of monitoring of school-based activity
6. Lack of material and facility
7. Transport fee
8. Availability of committee member

The obstacles which teachers and SEOs perceived in common are;

- Lack of time/Busy timetable
- Lack of resource persons and their capacity
- Unsupportive school leadership

3. Discussion

Lack of time was the largest obstacle. Primary school teachers have more lessons than secondary school teachers on average, hence primary school teachers are more likely to struggle finding the time for CPD. When teachers cannot work with competent resource persons, they also find it difficult to conduct CPD. In addition, school leadership is important not only to create a conducive environment for CPD but also to motivate teachers towards CPD .

On the other hand, the issue of lack of budget appeared at SEO level only. It could be said that teachers do not have to be concerned about budget because most CPD activities take place at their workplace. However, budget to buy materials are still needed.

This preliminary study suggests the importance of establishing a monitoring system. With a robust monitoring system, teachers' CPD status can be assessed and informed to the district and national levels in a timely manner, and actions can be taken accordingly.

## III. Methodology

Prior to the quarterly DCC/SCC monitoring, the monitoring team conducted screening by reviewing monthly reports submitted from January to March 2019 by pilot districts to identify DCCs and SCCs which meet the criteria below.

- ✓ Having conducted a DCC (SCC) meeting more than once in the period
- ✓ Having conducted a CPD activity more than once in the period

In addition to the criteria above, their responses including good practices and challenges were considered. Consequently, the following DCCs/SCCs were selected as target for this quarter.

- DCC
  - Not selected

- SCC
  - SCC Mahama (Kirehe)
  - SCC Kisaro (Rulindo)
  - SCC Cyinzuzi (Rulindo)
  - SCC Masoro (Rulindo)
  - SCC Nyanza (Gisagara)

Basically, target persons are DDE or DEO in case of DCC, and SEO in case of SCC. When visiting SEOs, the monitoring team pays a courtesy call on the district office. The quarterly monitoring takes the form of semi-structured interview with target persons at their office so that they can refer

to necessary information or show an evidence for responses. Interview sheets were prepared before, composed of common questions and specific questions that were customized to each sector, based on what they reported through DCC/SCC monthly reports. Where the respondent agreed, video and audio were captured to record as much information as possible.

The schedule of the quarterly monitoring is shown below.

**Table 2 Schedule of the Quarterly Monitoring**

| District | Activity | Names | Function | Date | Meeting venue |
|---|---|---|---|---|---|
| Kirehe | Courtesy call | MWANANGU Theophile | DDE | 23rd April, 2019 | District office |
| | Interview | NSENGIMANA Martin | SEO Mahama | 23rd April, 2019 | |
| Rulindo | Courtesy call | NDUWAYO Jean Denys | DDE | 23rd May, 2019 | District officeSector office |
| | Interview | NYIRIMANZI Alfred | SEO Kisaro | 23rd April, 2019 | Sector office |
| | Interview | HABUMUGISHA Jean de la Croix | SEO Cyinzuzi | 24th May, 2019 | Sector office |
| | Interview | MUKAKANANI Marie Josee | SEO Masoro | 24th May, 2019 | Sector office |
| Gisagara | Courtesy call | NYIRARUKUNDO Francoise | DEO | 29th May, 2019 | District office |
| | Interview | NSENGIYUMVA Alexis | SEO Nyanza | 29th May, 2019 | Sector office |

## IV. **FINDINGS**

One of the objectives of DCC/SCC quarterly monitoring visits is to check on the implementation of CPD through DCC and SCC at ground level.

1. CPD Status

A) <u>SEO's attendance to CBC training in 2018</u>

Almost all SEOs we met have confirmed that they attended CBC training last year, though it should be noted that they meant different trainings organized by different organizers including REB. Some SEOs answered about CBC induction training, and others answered about training on SBMs or training organized by development partners. "I attended CBC training in 2018 at Gisagara district office. The training was organized by the district. Participants were all key resource persons in education" SEO Nyanza (Gisagara district) said. "We have been trained on CBC in 2017.The training last for 3 days. The main objective of that training was to inform us about the new

curriculum which were brought in to replace the Knowledge Based curriculum" SEO Mahama (Kirehe district) confirmed.

B) Sector-based CBC training in 2018

Sector-based CBC training was supposed to be organized by SEOs to train all teachers on CBC in 2018. All visited SEOs confirmed that after the training on CBC held in March 2018, they organized sector-based CBC training. The box below shows examples of the way they organized. The key to successful sector-based training which requires participation of many teachers is likely to be involvement of trainers and head teachers (school leaders) in the planning stage.

**SEO's voice**

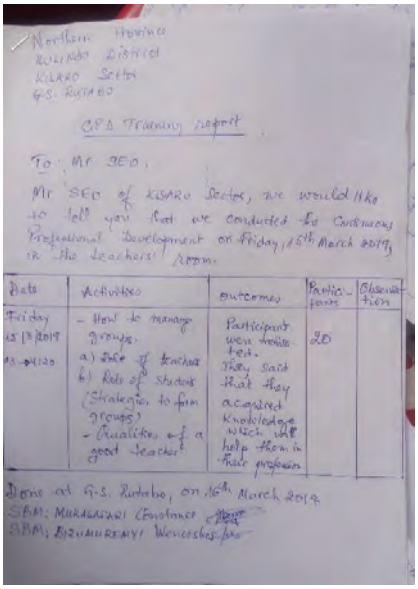
- I firstly conducted technical meeting with SBTs to identify needs, for instance, what teachers need in terms of CBC implementation, and training facilities (materials, transport, water etc.). Afterward I gathered all HTs to inform them about the training and the support needed from them for trainings to be a success. [SEO Nyanza]
- I had a meeting with Head Teachers and mentors, and we planned the date and the venue for the training. It took place during the weekend and almost all teachers attended the meeting. The host school prepared lunch but it depends on availability of capitation grants [SEO Cyinzuzi]

C) Sector-based training

This year, sector-based training continues in Rulindo. In cooperation with development partners including IEE, Soma Umenye and BLF, they have organized a training for SBMs under SBMP once a month. Compared to CBC training targeting at all teachers in the sector, the target is smaller in the training for SBMs (one teacher per school). This makes it easier for SEOs to mobilize resources, such as trainers (MTs), trainees (SBMs) and materials. There are some good examples as follows.

**Good practices**

- Conducting the training jointly with the neibouring sector [SEO Kisaro]
  - Buyoga sector and Kisaro sector take turn in organization of the training.
  - The host school provides lunch from the capitation grant and other schools also contribute financially.
  - Minutes are taken by the trainer of Kisaro sector, when Buyoga sector hosts the training, and vice versa.
- Capitation grant for mission allowances [SEO Cyinzuzi]
  - Rwf 5,000 are given to teachers who travel longest distance. Others get Rwf 2,000 or Rwf 1,000, depending on distance.
- Involving Head teachers in planning [SEO Kisaro]
  - Head teachers' understanding towards the importance of the training is critical in mobilizing resources. After they get involved, they started to provide recourses including capitation grant.



CPD Training report

To: Mr SEO,

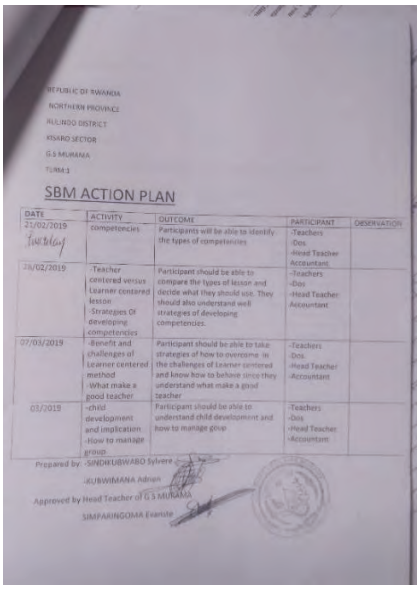
Mr SEO of KISARO Sector, we would like to tell you that we conducted the Continuous Professional development on Friday, 15th March 2019 in the teachers' room.

| Date | Activities | outcomes | Participants | Observation |
|---|---|---|---|---|
| Friday 15/3/2019 | - How to manage groups.<br>a) Role of teacher<br>b) Role of students<br>(Strategies to form groups)<br>- Qualities of a good teacher | Participants were invited. They said that they acquired knowledge which will help them in their profession | 20 | |

Done at G.S. Rutabo, on 16th March 2019

SBM: MUKAMAZIRI Constance

SBM: BIZIMUREMYI Wenceslas



REPUBLIC OF RWANDA
NORTHERN PROVINCE
BULINDO DISTRICT
KISARO SECTOR
G.S MURAMA
TURN-1

SBM ACTION PLAN

| DATE | ACTIVITY | OUTCOME | PARTICIPANT | OBSERVATION |
|---|---|---|---|---|
| 21/02/2019 Tuesday | competencies | Participants will be able to identify the types of competencies | -Teachers<br>-Dos<br>-Head Teacher<br>Accountant | |
| 28/02/2019 | -Teacher centered versus Learner centered lesson<br>-Strategies Of developing competencies | Participant should be able to compare the types of lesson and decide what they should use. They should also understand well strategies of developing competencies. | -Teachers<br>-Dos<br>-Head Teacher<br>Accountant | |
| 07/03/2019 | -Benefit and challenges of Learner centered method<br>- What make a good teacher | Participant should be able to take strategies of how to overcome in the challenges of Learner centered and know how to behave since they understand what make a good teacher | -Teachers<br>-Dos<br>-Head Teacher<br>-Accountant | |
| 03/2019 | -child development and implication<br>-How to manage group | Participant should be able to understand child development and how to manage group | -Teachers<br>-Dos<br>-Head Teacher<br>-Accountant | |

Prepared by: -SINDIKUBWABO Sylvere
-IGUBWIMANA Adrien

Approved by Head Teacher of G.S MURAMA
SIMPARINGOMA Evariste

Photo: Example of training report (Kisaro sector)

D) School-based CPD

Conducting school level CPD for teacher is not an easy task. It requires time and it can have a conflict with timetables. One way to avoid time conflict is to conduct CPD in weekends but it also requires some conditions such as having financial means to pay teachers allowance and transport. The alternative way is to conduct it during weekdays by adjusting teachers' timetables so that all

teachers in the same department can meet at the certain time of the week, for example. In Mahama sector, some schools set school-based CPD on every Thursday.

Teachers resistance to CBC can be seen at many sectors. According to SEOs, this is a matter of lack of their understanding, and thus, though training, they have been gradually adapting to CBC. In other cases, there are some teachers who do not attend CPD. In this quarterly monitoring, we were not able to focus on and identify the root causes of teachers' resistance. These should be further investigated in the future in order to take appropriate measures.

## 2. SCC Operation Status

### A) Membership

In most sectors we visited, the membership of SCCs was based on the guideline in the DCC concept note. The case of Rulindo suggests the importance of Mayor and Vice Mayor's leadership. As these leaders are interested in education, they keep on encouraging stakeholders, which has accelerated DCC and SCCs' activities and created favorable environment for teachers' CPD.

On the other hand, parents (SGACs) were less represented in some sectors because of lack of their awareness. In some cases, when SCCs planed trainings for teachers, the SEOs invited those who were relevant only, such as Head Teachers and trainers, to discuss intensively. They adjust participants according to the purpose of meetings.

### B) SCC meetings

In general, all SEOs met revealed that SCC members regularly meet to discuss on different challenges that affect learning and teaching practices even if frequency of meeting varies. Some meet every month and others once a term.

"Once a month, SCC members meet to discuss on different issue affecting quality teaching and learning and to plan for CPD activities that will help in mitigating those challenges", said SEO Nyanza.

"In February SCC organized a meeting in which all HTs were invited plus some DOSs and parents representative to discuss on quality of education in our sector and challenges as well as identifying of what problems teachers are facing in the implementation of CBC. In a participative way and through an open discussion we have figured out that the level of teachers' understanding of CBC is still very low. Together as a team we took some actions including having regular CPD time in each school so that teachers could have time to seat together, discuss challenges in their teaching practices and find out solution to improve own teaching. The last two periods on Thursdays are reserved for CPD", said SEO Mahama in Kirehe district.

C) SCC's monitoring activities

One of the SCC's responsibilities is monitoring of CPD at school level. SCC Cyinzuzi performs a weekly school visit every Thursday. The team is composed of the executive secretary, SEO, Head Teachers and mentors (sometimes). They use an inspection book and assess teachers' lessons. The team checks if the teachers put advice into practice when visiting the school next time.

## V. CHALLENGES

In this quarterly monitoring, the following challenges were found. Most of them coincide with the preliminary study using data of online questionnaires to teachers and SEOs.

A) Coordination between SCCs and DCC

SCC operation is not linked with DCC. The coordination between DCC an SCC still has some gaps. There is no established communication and reporting channels by which all CPD activities at sector and school levels could be streamlined. For improving the coordination between SCCs and DCC, it requires the communication channels by which all stakeholders involved in CPD will have common understanding on CPD issues, share the same vision and objective and strategies to achieve objectives.

B) Allocating CPD time

Time for CPD is still a big challenge for promoting CPD at school level. Timetables are full especially for primary school teachers. Teachers do not have time to meet with fellow teachers. Even when SBMs were trained at the sector level, they are struggling in finding the time to train fellow teachers at their respective schools.

C) Funds for CPD

The cost for CPD is very high especially when participants must travel to the venue, such as for sector-based training. The necessary cost includes the transportation fee for participants, lunch and materials. Capitation grant is allocated to schools, but it has not been automatically disbursed for such event, without school leaders' understanding of the necessity.

D) School leaders' understanding of CBC

Head teachers have not been necessarily trained on CBC since its introduction in 2015. Some SCCs identified the problem of head teachers' low understanding of CBC. They cannot assess lessons in an appropriate manner at the time of lesson observation. This may

adversely influence teachers' ability in lesson delivery based on CBC or hinder their motivation.

## VI. RECOMMENDATIONS

### A) Establishment of problem solving cycle between SCCs and DCC

DCC should be able to monitor and evaluate all SCCs' activities to enhance a problem solving cycle from school to national level, and take action accordingly. The case in Rulindo also suggest the importance of leadership at district level to create a favorable environment for CPD. This would be also the case in sector level, and the executive secretary should take part in improvement in education.

SEOs should share their SCC plan at the district level and report their activities on time. It is recommended that SCCs develop an annual action plan, and report implementation of activities through monthly monitoring report form provided by REB. Districts should track the progress and give feedback. DCC meetings can serve as a community where members from different sectors share their plans, good practices to learn from each other, and challenges in order to get ideas to solve them. DCC meetings should also take place to discuss items to be coordinated across sectors.

Though MINEDUC is not a line ministry for DCCs and SCCs, REB would be able to monitor and take necessary actions as an executive agency responsible for quality education under MINEDUC, if DCCs and SCCs could report their overall CPD activities in a timely manner.

### B) Arrangement of timetables

As recommended in the National Teacher CPD Framework, Head Teachers should include CPD hours in the school timetable for all teachers. Two periods or 80 minutes per week is the recommended minimum. As of March 2019, not all schools allocate CPD hours in the timetable. If finding the time for all teachers to meet, the school may be able to start with allocating CPD time by departmental level. The National Teacher CPD Framework should be disseminated to schools so that they get guidelines on how CPD should be conducted on the ground level.

### C) Improvement of capitation grant management

Taking into consideration the current situation that sectors do not have budget even when SCCs plan sector-based trainings, SCCs should share annual action plan with all Head Teachers so that they can plan when and how much they should disburse for what CPD activities at the beginning of the year. In Kisaro sector in Rulindo, SBMs who attended training at the sector level came to receive transportation fee from their own schools after

the SCC involved Head Teachers in the planning. SBMs in Cynzizi sector in Rulindo receive allowance according to travel distance to support those who come from further places.
Another way to solve financial issues related to sector-based CPD is to allocate budget to SCCs. By doing so, SCCs can plan activities in line with financial conditions.

D) Provision of an opportunity to understand CBC for school leaders

The importance of the role which school leaders play in promoting teachers CPD has been revealed in some studies (Mutsinzi, Ono, Sugiyama, Yoshikawa, & Matsuzuki, 2017; Yoshikawa, Sugiyama, Mutsinzi, & Morita, 2015). Various initiatives are ongoing to improve school leaders' competences including knowledge about CBC at the national level. Therefore, it is required that DCCs and SCCs monitor their performance and provide opportunities to improve competencies. For example, SCC Kisaro decided to organize training for Head Teachers as they found the Head Teachers did not have enough knowledge about CBC. Improvement in Head Teachers' understanding of CBC could have a favorable influence in the challenges B) and C) above.

## VII. REFERENCE

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Mutsinzi, A., Ono, Y., Sugiyama, R., Yoshikawa, K., and Matsuzuki, S. (2017). Bridging the Gap between Policy and Practice: The Case of Competency-Based Curriculum in Rwanda, presentation at the 61st World Assembly of International Council on Education for Teaching.

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Yoshikawa, K., Sugiyama, R., Mutsinzi, A., and Morita, Y. (2015). School-Based In-Service Training in Rwanda Assessing its Effectiveness for Teachers' Professional Development. 59th Yearbook of Teacher Education, International Council on Education for Teaching (ICET), pp365 –374, http://www.icet4u.org/docs/Naruto__2015.pdf

**Appendix 1. Districts and Sectors which submitted monthly monitoring report in the pilot phase**

Districts which submitted a pilot monthly DCC report

- Gisagara
- Kirehe

Sectors which submitted a pilot monthly SCC report

| District | Sector |
|---|---|
| Gisagara | Mukindo, Save, Mamba, Kibilizi, Kansi, Musha, Mugombwa, Gikonko, Kigembe, Nyanza |
| Kirehe | Kirehe, Gahara, Nyarubuye, Mahama, Mushikiri, Gatore |
| Rulindo | Bushoki, Buyoga, Cyinzuzi, Kisaro, Kinihira, Masoro, Rusiga, Base, Rukozo, Murambi, Mbogo, Shyorongi |

**Appendix 2. Photos**

Training in Masoro sector

Training in Cyinzuzi sector

# Appendix 13. DCC/SCC Quarterly Monitoring Report (2nd Quarter of 2019)

**DCC/SCC QUARTERLY MONITORING REPORT**
**PERIOD: 2nd QUARTER OF 2019**
**MONITORING DATE: 26th AUGUST – 6th SEPTEMBER**

## I. INTRODUCTION

In July 2016, REB requested districts and sectors to establish District CPD Committees (DCCs) and Sector CPD Committees (SCCs) in order to coordinate and support CPD which can maximize efficiency and effectiveness of teaching and learning.

Now that main phase of CBC induction program in 2015/16 to 2017/18 is over, the importance of school-based CPD has increased for teachers to continuously improve their lessons.

Furthermore, the government embarked on strengthening CPD by setting it as Strategic Priority 2 of the ESSP 2018/19-2022/23, formulating National Teacher CPD Framework and having decided at a cabinet meeting that engagement in CPD shall be considered in advancing teachers' career path. In this regard, in September, 2019, REB has requested that districts include teachers' Continuous Professional Development into their performance contract.

Effective monitoring system is now required for strengthening problem-solving cycle from school to national level. To this end, Teacher Training Unit (TTU) of the REB TDM&CGC Department in cooperation with JICA SIIQS Project developed the "concept note for monthly and quarterly DCC/SCC monitoring".

In accordance with the concept note, a monitoring team composed of TTU staff and JICA SIIQS Project team members conducted DCC/SCC quarterly monitoring visits for the second quarter of 2019 (April-June) to investigate their operation status, good practices and challenges. Quarterly monitoring visits were conducted in eleven districts, namely; Rulindo, Rwamagana, Kayonza, Muhanga, Gisagara, Rulindo, Musanze, Nyabihu, Karongi, Gasabo and Rubavu. These visits were conducted between 26th August and 6th September 2019 by TTU staff and SIIQS project team.

## II. OBJECTIVES

The objectives of the 2nd DCC/SCC quarterly monitoring were the following;

1. To check functionality of DCC/SCC and CPD implementation progress at district, sector and school levels
2. Collect good CPD practices in details to be shared with other districts and sectors
3. Investigate challenges encountered by DCCs/SCCs so that REB can take measures in a timely manner
4. Promote understanding of importance of CPD monitoring among DCC/SCC members for establishment of sustainable monitoring system

## III. METHODOLOGY

Prior to the quarterly DCC/SCC monitoring, the monitoring team conducted screening by reviewing DCC/SCC need assessment responses conducted in July 2019. The assessment tool was put online as a Google form for collecting information on DCC/SCC operation and on what they really need for monitoring, evaluating and coordinating all CPD-related activities.
Target sectors of the monitoring were sampled according to their responses in the need assessments and the following were main criteria;

- ✓ Having conducted SCC meetings more than once in the period
- ✓ Having conducted CPD activities more than once in the period
- ✓ Having reported achievements attributed to SCC
- ✓ Having a SCC plan
- ✓ Having reported CPD good practices

In addition to the criteria above, some other sectors were sampled. They are where the target schools of SIIQS end line survey are located, which was conducted in June 2019.
The table below illustrates the sampled sectors, reasons why they were selected, and dates of visit. The districts were also visited to understand the situation from district side.

| District | Activity | Names | Function | Date |
|---|---|---|---|---|
| Bugesera | Courtesy call | GASHUMBA Jacques | DDE | 26/8/2019 |
| | Interview | NKESHIMANA Vital | SEO/ Ruhuha | 26/8/2019 |
| Rwamagana | Courtesy call | RWEMA Moussa | DDE | 27/8/2019 |
| | Interview | RUHINGUBUGI Georges | SEO/ Fumbwe | 27/8/2019 |
| | Interview | NKERAMUGABA Janvier | SEO/ Kigabiro | 27/8/2019 |
| | Interview | NIYONAGIRA Claudine | SEO/ Musha | 27/8/2019 |
| Nyabihu | Courtesy call | VUMERA Jean Bosco | DDE | 27/8/2019 |
| | Interview | HAKUZWEYEZU Alexis | SEO/ Rurembo | 27/8/2019 |
| | Interview | HABARUGIRA James | SEO/ Jenda | 27/8/2019 |
| | Interview | SINDIKUBWABO Innocent | SEO /Rambura | 29/8/2019 |
| Gisagara | Courtesy call | HARERIMANA | DDE | 28/8/2019 |
| | Interview | MUNYAKAZI Boaz | SEO/ Ndora | 28/8/2019 |
| Rubavu | Interview | BIKEKA Cyrdion | SEO/ Kanama | 28/8/2019 |
| Muhanga | Courtesy call | IBANGARYAYO Emmanuel | DEO | 29/8/2019 |
| | Interview | SEMANA Vincent | SEO/ Kibangu | 29/8/2019 |
| Musanze | Interview | HAKIZIMANA Innocent | SEO/ Shingiro | 29/8/2019 |
| | Interview | HAGUMA Emmanuel | SEO/ Remera | 29/8/2019 |
| Rulindo | Interview | NYIRIMANZI Alfred | SEO/ Kisaro | 30/8/2019 |
| | Interview | NYIRAMANA Jeanette | SEO/ Bushoki | 30/8/2019 |
| Kayonza | Courtesy call | BISANGWA Emmanuel | DDE | 3/9/2019 |
| | Interview | TUMUSABIRE Benitha | SEO/ Mukaranage | 3/9/2019 |
| Gasabo | Interview | MASENGESHO Cyrdion | SEO/ Gatsata | 4/9/2019 |
| Karongi | Courtesy call | HITUMUKIZA Robert | DDE | 6/9/2019 |
| | Interview | MWUMVANEZA Bruno | SEO/ Rubengera | 6/9/2019 |

Basically, target persons were DDE or DEO in case of DCC, and SEO in case of SCC. The quarterly monitoring takes the form of semi-structured interview with target persons at their office so that they can refer to necessary information or show an evidence for responses. Interview sheets were prepared before, composed of common questions and specific questions that were customized to each sector, based on what they reported through DCC/SCC need assessment. Where the respondent agreed, the interview was videotaped.

## IV. FINDINGS

### 1. CPD Status

During these monitoring visits, it was confirmed that CPD is implemented in two levels;

#### A) Sector CPD

All the visited sectors confirmed that sector CPD has been conducted. However, the frequency was different from one sector to another. In the following sectors, sector-based CPD is organized once per month, while in some other once per term or occasionally:

- ✓ Bushoki and Kisaro (Rulindo)
- ✓ Rambura, Rurembo and Jenda (Nyabihu)
- ✓ Shingiro and Remera (Musanze)
- ✓ Musha, Kigabiro, Fumbwe (Rwamagana)
- ✓ Kibangu (Muhanga)
- ✓ Ndora (Gisagara)

Some SEOs clarified that they invited all Head teachers (HTs), Director of study (DOS), school-based Mentors (SBMs) and mentor trainers to attend CPD at sector level. But few of them invited only SBMs for attending CPD. Main activities in CPD also defer from one sector to another but they are mainly around the following;

- Discussion on issues and challenges in teaching and learning practices
- Discussion on CBC implementation key components such as CBC methods and assessment techniques (Bloom's taxonomy)
- Peer learning for school leaders
- Lesson observations for providing teachers with constructive feedback
- School improvement plans
- School CPD plans

The SEO takes lead in organizing sector CPD in collaboration with key resource persons in the sector namely; mentor trainers, SBTs, SBMs and school leaders. In most cases schools provide its resource persons to attend CPD with transport and lunch fees. CPD

team decides the venue, depending on the organized activities. The venues vary from schools to sector office.

Sector CPD resource persons have to share with their fellow teachers what they have acquired during CPD afterwards. HTs and DOS have to make follow on the implementation.

This monitoring has revealed some gaps in reporting and filing of CPD activities. Most sectors did not have filed reports on performed CPD activities at sector level, even if they had some evidence such as pictures and brief report shared in the sector's CPD WhatsApp group. The monitoring team has advised them to have a CPD file (either hard, or both hard and soft) in which all CPD related information can be kept. Nevertheless, a few SEOs have been able to file CPD reports in a safe manner and even share them with districts.

### B) School CPD

All visited SEOs confirmed that schools in their respective areas have conducted CPD. For instance in Ndora (Gisagara), each school has two hours per week reserved for CPD, same as Mukarange sector in Kayonza district. In some other sectors such as Remera (Musanze), Bushoki and Kisaro (Rulindo) and Kanama (Rubavu), all schools were requested to conduct CPD once per week. Except in Kisaro and Remera where schools have made their CPD plans, other schools do not have a CPD plan or they have not shared them with SEOs even if they have. Mainly SBMs play key roles in organizing CPD at school level as it was revealed by SEOs. School management also supports CPD by providing CPD time. The monitoring revealed a gap in school CPD management by SCC. SEOs except those aforesaid do not have CPD plans of their respective schools, which would otherwise facilitate them in monitoring and supporting them. Schools do not report on their CPD performance, which would enable the SEO to make follow up accordingly and bring in the support needed. However, some sectors such as Shingiro (Musanze) and Kisaro have taken initiative to encourage schools to have a CPD plan and submit them to the SEOs so that the latter could plan how to support them. CPD plans go hand in hand with CPD reports whereby schools report on CPD performance against planned activities. During the visits, all SEOs were encouraged to work closely with their schools, motivate them to have a CPD plan for a given period (quarterly, biannually or annually) and keep records on CPD as well as reporting.

## 2. SCC Operation Status

### A) SCC establishment

All visited SEOs confirmed that SCCs had been established. Some were established in 2017 and others in 2018. Members were appointed as per the DCC/SCC concept note. SCC members were trained on their roles and responsibilities. However, some members

are not likely to fulfill their responsibilities. These are especially Executive Secretaries of Sectors. Given reasons were that ES have many competing activities in the sectors, that sometimes they do not understand their role in SCC or could have limited knowledge on CPD, and in few case SCC was not a priority for the sector. Other members that are hard to find were the representative of SGACs. Almost all visited SEOs claimed that roles of parents in SCC were not well defined.

**B) SCC Plans**

Even though SCCs have been established in all visited sectors, SCC plans existed only in half of them. Rurembo developed a SCC plan for the last year (2018) but the committee has not yet developed a plan for this year. Kisaro has a well-elaborated SCC plan which was made considering school CPD plans. SCC Gatsata (Gasabo) has developed its plan of activities that will be validated in the coming SCC meeting in September. SCC Rambura established a plan for 2018-2019. Main outputs were; school improvement plan, raising parents' awareness on their roles in promoting education. Other visited sectors that have SCC plans are; Shingiro and Remera, Kigabiro, Fumbwe and Musha. According to SEOs' responses, SCC plan were developed without referring to the DCC plan. Planning was SCC's initiative but some SEOs shared the plan with DCC through DDE. In all other sectors that were not mentioned above, SCCs do not have plans for operating. Despite non-existence of SCC plans, they had CPD plans. This means that CPD plans were developed by the SEOs and some other resource persons without involvement and engagement of SCC members. The monitoring team advised SEOs to engage all SCC members in CPD planning and SCC activity planning.

**C) SCC meetings**

In DCC/SCC concept note, it is proposed that the SCCs meet at the end of each term to review the data collected. At this meeting, members discuss challenges faced, and any lack of action or lack of commitment to achieve the objectives of the action plan. The committees can give feedback directly to schools. Remedial actions can be identified and allocated to relevant individuals. In some instances, remedial actions identified in DCC meetings may be for HTs or teachers and would therefore have to be communicated by SEOs at SCC meetings. Except Mukarange, Ruhuha, Bushoki, and Jenda, SCCs have managed to meet at least once per term or every month. For instance, SCC Kisaro members meet every month, SCC Rambura meet every term, so does Shingiro, Kigabiro, Ndora, Fumbwe and Musha. During a SCC meeting, members discuss key challenges for implementing CPD and take key actions to deal with identified challenges.

## 3. Good practices

The monitoring team found the following good practices.

### A) Schools' Audit committees

In Kanama sector, while sitting in SCC and discussing issues in teaching and learning, misusing the school's budget was revealed to be one of causing factors. Sometimes school management could use the school's budget for the activities that are not directly related with teaching and learning. Teachers always claimed not having teaching and learning aids because the school did not provide. It was decided that each school should have an audit committee that will ensure that school budget is mostly used to improve teaching and learning (Kanama sector).

### B) Use of fingerprint to manage teachers' punctuality

Managing teachers' punctuality was a big challenge in Gatsata sector. During a SCC meeting, members discussed this issue and concluded that schools would have a fingerprints machine so that HTs would be able to deal with teachers who come to school late based on evidence (data provided by fingerprint). Now three schools already bought and installed these machines and the issue has mitigated (Gatsata sector).

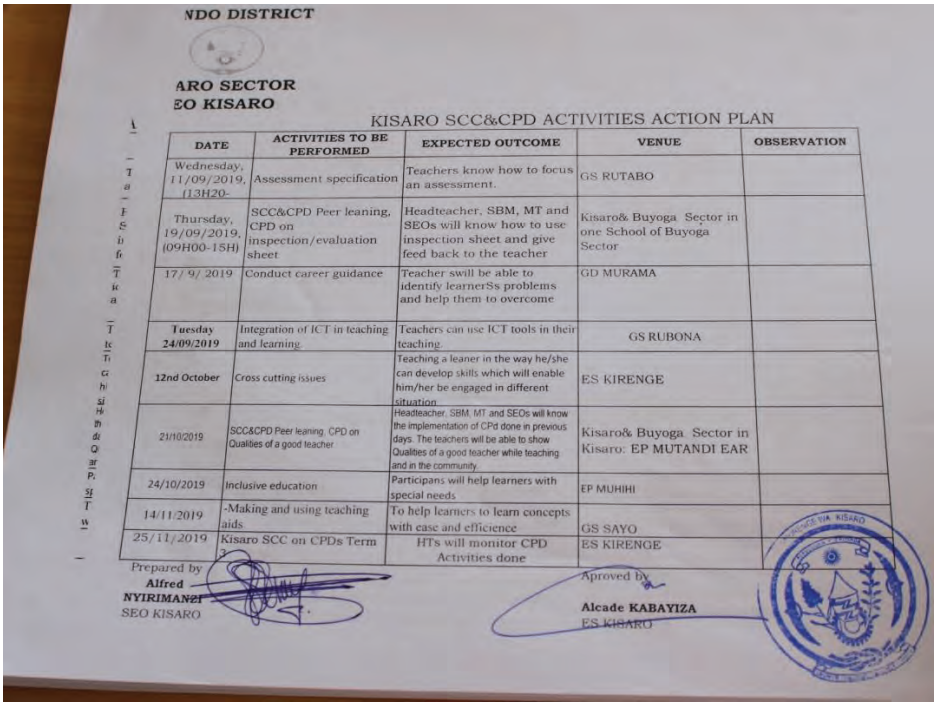
### C) CPD planning and reporting

Absence of schools/sector CPD plans and reporting system from schools to sectors was identified by SCC members as a main challenge in managing CPD activities at schools' levels in Kanama, Kisaro and Shingiro sectors. SCC members decided that schools make CPD plan and share them with SEOs so that they make follow up accordingly. This has made it easy for SEOs to monitor, coordinate and give support needed toward promoting CPD (Kanama sector, Kisaro sector, Shingiro sector).

**SEO's voice**

- Some schools could not report on CPD performance in their schools. Sitting together with other SCC members, we realized that the issue of not reporting is holding back the SCC to coordinate and monitor CPD at school level. The committee decided to instruct all HTs to report on CPD on a monthly basis. This action is being implemented and it will help the committee to effectively monitor and coordinate all CPD activities [SEO Kisaro/ Nyirimanzi Alfred].

- During a SCC meeting, we have realized that the fact that schools do not have a CPD plan, school improvement plans (SIPs), and clear vision and mission is hampering the quality of teaching. The SCC decided to advise all schools leaders to have SIPs, CPD plans, clear visions and mission. The SCC also advised schools to engage all stakeholders (teachers and parents) to participate, so that everyone understands his/ her role in promoting teaching and learning and in achieving school's vision and mission. This resolution has been put into action, and it will have a positive impact on the quality of education in our sector [SEO Kanama/ Bikeka Cyrdion]



NDO DISTRICT

ARO SECTOR
EO KISARO

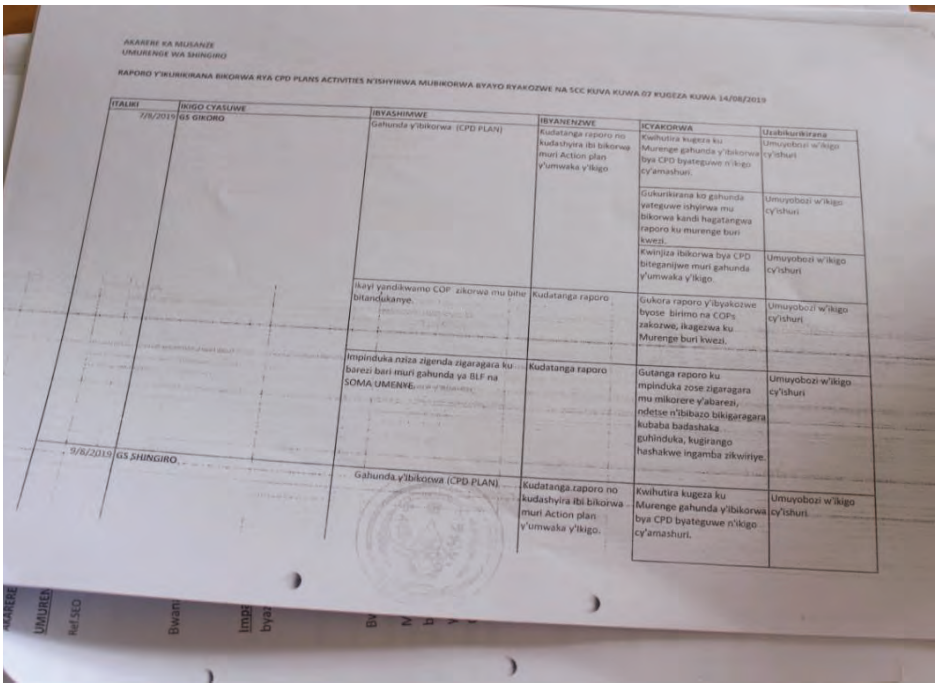
KISARO SCC&CPD ACTIVITIES ACTION PLAN

| DATE | ACTIVITIES TO BE PERFORMED | EXPECTED OUTCOME | VENUE | OBSERVATION |
|---|---|---|---|---|
| Wednesday, 11/09/2019, (13H20- | Assessment specification | Teachers know how to focus an assessment. | GS RUTABO | |
| Thursday, 19/09/2019, (09H00-15H) | SCC&CPD Peer leaning, CPD on inspection/evaluation sheet | Headteacher, SBM, MT and SEOs will know how to use inspection sheet and give feed back to the teacher | Kisaro& Buyoga Sector in one School of Buyoga Sector | |
| 17/ 9/ 2019 | Conduct career guidance | Teacher swill be able to identify learnerSs problems and help them to overcome | GD MURAMA | |
| **Tuesday 24/09/2019** | Integration of ICT in teaching and learning | Teachers can use ICT tools in their teaching. | GS RUBONA | |
| **12nd October** | Cross cutting issues | Teaching a leaner in the way he/she can develop skills which will enable him/her be engaged in different situation | ES KIRENGE | |
| 21/10/2019 | SCC&CPD Peer leaning, CPD on Qualities of a good teacher | Headteacher, SBM, MT and SEOs will know the implementation of CPd done in previous days. The teachers will be able to show Qualities of a good teacher while teaching and in the community. | Kisaro& Buyoga Sector in Kisaro: EP MUTANDI EAR | |
| 24/10/2019 | Inclusive education | Participans will help learners with special needs | EP MUHIHI | |
| 14/11/2019 | -Making and using teaching aids | To help learners to learn concepts with ease and efficience | GS SAYO | |
| 25/11/2019 | Kisaro SCC on CPDs Term 3 | HTs will monitor CPD Activities done | ES KIRENGE | |

Prepared by
**Alfred NYIRIMANZI**
SEO KISARO

Aproved by
**Alcade KABAYIZA**
ES KISARO

***Photo: CPD plan (Kisaro sector/Rulindo)***



AKARERE KA MUSANZE
UMURENGE WA SHINGIRO

RAPORO Y'IKURIKIRANA BIKORWA KYA CPD PLANS ACTIVITIES N'ISHYIRWA MUBIKORWA BYAYO RYAKOZWE NA SCC KUVA KUWA 07 KUGEZA KUWA 14/08/2019

| ITALIKI | IKIGO CYASUWE | IBYASHIMWE | IBYANENZWE | ICYAKORWA | Uzabikurikirana |
|---|---|---|---|---|---|
| 7/8/2019 | GS GIKORO | Gahunda y'ibikorwa (CPD PLAN) | Kudatanga raporo no kudashyira ibi bikorwa muri Action plan y'umwaka y'ikigo | Kwihutira kugeza ku Murenge gahunda y'ibikorwa bya CPD byateguwe n'ikigo cy'amashuri. | Umuyobozi w'ikigo cy'ishuri |
| | | | | Gukurikirana ko gahunda yateguwe ishyirwa mu bikorwa kandi hagatangwa raporo ku murenge buri kwezi. | Umuyobozi w'ikigo cy'ishuri |
| | | | | Kwinjiza ibikorwa bya CPD biteganijwe muri gahunda y'umwaka y'ikigo. | Umuyobozi w'ikigo cy'ishuri |
| | | Ikayi yandikwamo COP zikorwa mu bihe bitandukanye. | Kudatanga raporo | Gukora raporo y'ibyakozwe byose birimo na COPs zakozwe, ikagezwa ku Murenge buri kwezi. | Umuyobozi w'ikigo cy'ishuri |
| | | Impinduka nziza zigenda zigaragara ku barezi bari muri gahunda ya BLF na SOMA UMENYE. | Kudatanga raporo | Gutanga raporo ku mpinduka zose zigaragara mu mikorere y'abarezi, ndetse n'ibibazo bikigaragara kubaba badashaka guhinduka, kugirango hashakwe ingamba zikwiriye. | Umuyobozi w'ikigo cy'ishuri |
| 9/8/2019 | GS SHINGIRO | Gahunda y'ibikorwa (CPD PLAN) | Kudatanga raporo no kudashyira ibi bikorwa muri Action plan y'umwaka y'ikigo. | Kwihutira kugeza ku Murenge gahunda y'ibikorwa bya CPD byateguwe n'ikigo cy'amashuri. | Umuyobozi w'ikigo cy'ishuri |

***Photo: SCC report (Shingiro sector/Musanze)***

### D) Allocating time for CPD at school level

It is important to conduct CPD according to the teachers' and learners' needs. School-based CPD can serve as a platform to address them. Some sectors successfully motivated schools to allocate time for CPD at school level.

**SEO's voice**

- Conducting CPD at sector level is too expensive. The sector cannot afford to bring all teachers together to train and support in implementing CBC. During SCC meeting we decided that teachers had to attend CPD activities at their school and we advised each school to have time of two periods reserved for CPD every week [SEO Ndora/ Munyakazi Boaz]

- One key action taken by SCC during the meeting was that schools should have time for CPD and conduct it on a regular basis [SEO Kigabiro/ Nkeramugaba Janvier]

### E) School contribution to sector CPD

One of the challenges in CPD implementation in Bushoki sector is the lack of budget, especially when it comes to organization of CPD at sector level. Sitting together with HTs, mentor trainers and some other stakeholders, they realized that together they can overcome this challenge. They concluded that each school contributes to the needed budget to buy material and pay transport and lunch for participants. Now every month, a monthly CPD is conducted and every teacher is motivated to attend (Bushoki sector).

### F) Engaging HTs in CPD at sector level

The big challenge in implementing CPD at school and sector levels in Kisaro sector was that HTs did not understand CPD as school leaders. During SCC meetings, they realized that if they engage school leaders, it would help them overcome many other challenges namely; time for CPD, needed resources and materials and budget to cover expenses related to CPD. Now all HTs understand CPD very well and are willing to give whatever support needed to promote it in their schools ( Kisaro sector).

### G) Teaching and learning aids week

Teachers in Musha sector were too reluctant to use teaching aids in lessons. These aids include textbooks and others supplementary resources. As a SCC, they planned teaching and learning aids week to encourage and motivate teachers to use them (Musha sector).

## 4. Challenges

The following are main challenges identified during the 2nd quarter DCC/SCC monitoring.

### A) Monitoring from Upper Levels

Many SEOs suggested the importance of monitoring from the upper levels (district and national levels). They understood the importance of SCC for coordinating CPD activities at sector level, but without regular monitoring and supervision from the district, they tend to deal with other burning issues, among their many tasks. They agreed that if the district requested for reporting, they would definitely submit reports. This is also the case for DCCs. DDEs also have many duties including DCC, but there has been little monitoring on DCC from REB. Therefore, they have prioritized other tasks over DCC issues, and have not monitored SCC so often.

### B) Collaboration between and DCC and SCCs

The monitoring revealed that there was no collaboration between DCC and SCCs. The coordination between DCC and SCCs still has some gaps. There is no established communication and reporting channels between DCC and SCCs by which all CPD activities at sector and school levels could be streamlined. For improving the coordination between DCC and SCCs, it requires the communication channels for sharing information on both achievements and challenges.

### C) Leadership of some key stakeholders

Almost all SEOs visited confirmed that ES of sector has never chaired the SCC meeting. The reasons were that ES were not engaged and made aware of their responsibilities in the committee. Some ES have not been informed on CPD as one of the education sector priorities. Besides, HTs were not trained on CPD and how to coordinate CPD at school level. This is challenging CPD promotion and implementation in schools even if some SCCs managed to train HTs on CPD on their own initiative.

### D) Awareness of Committee members

Some SEOs still struggled to engage committee members in SCC activities. They appointed parent representatives to committee members, according to the proposed composition in the DCC/SCC concept note. However, for some parent representatives, teachers' CPD is not something they have a stake in. What they are interested in is their children' attendance or performance. There are even sectors where dropout is the biggest concern and members do not reach the level to concentrate on CPD only. Low awareness of some committee members has made it difficult to discuss CPD collectively in SCC.

## E) Time

a) CPD time for teachers

Even if schools make some arrangements to conduct CPD, official time for CPD is still a big challenge for promoting CPD at school level. Timetables are full especially for primary school teachers. SBMs do not have needed time to organize CPD even if were trained at the sector level, they are struggling in finding the time. Teachers do not have time to meet with fellow teachers. Even when SBMs were trained at the sector level, they are struggling in finding the time to train fellow teachers at their respective schools.

b) Time for DCC/SCC members

As with the challenge in CPD, time was the serious problem for DCCs and SCCs. Committee members are engaged in different duties and responsibilities. Having to perform too much unplanned tasks holds SEOs to concentrate on planned activities in general, and to coordinate CPD at sector and school levels. SCCs meetings or planned CPD could be postponed many times due to this issue.

Lack of time is especially the case for DCCs, because its members come from different sectors, which of course have different activities, and they take more time to come up to the venue. To address this problem, one DDE considered putting a few different meetings together at one time to manage time more efficiently.

## F) Budget

a) Budget for CPD activities

The cost for CPD is very high especially when participants must travel to the venue, such as for sector-based training. The necessary cost includes the transportation fee for participants, lunch and materials. Some SCCs have managed to overcome this challenge by convincing schools' leaders to bring in contribution to cover CPD related expenses but others have not.

b) Budget for DCC/SCC work

DDEs and SEOs pointed to the problem that they had to call members though they would not pay them for transportation. Thus, DCCs and SCCs have tried to manage activities without budget, or a little budget if any. If DCC/SCC was in district's or sector's performance contract (Imihigo), budget would be properly allocated, and stakeholders also put a priority on the activities.

## V. RECOMMENDATIONS

### 1. Encourage school leaders to promote and implement CPD at school level

The roles of school leaders should not be underestimated. As a matter of fact, where school leaders were trained on CPD, CPD is well organized and implemented. For example, SCC Kisaro decided to organize training for HTs as they found the HTs did not have enough knowledge about CPD. Improvement in HTs' understanding of CPD could have a favorable influence in the challenges above.

### 2. Redefine use of capitation grant

Budget for CPD is a big challenge especially when a monthly CPD is planned. In some sectors like Bushoki (Rulindo), schools use a small part of capitation grant to cover cost related to CPD, taking into consideration the current situation that sectors do not have budget to conduct sector CPD. Schools provide SBMs, DOS and HTs who participate in sector monthly CPD with transport fees and lunch. Redefining uses of capitation grant could help in resolving the challenge of CPD time.

### 3. Arrange timetables

As recommended in the National Teacher CPD Framework, HTs should include CPD time in the school timetable for all teachers. Two periods or 80 minutes per week is the recommended minimum. As of March 2019, not all schools allocate CPD time in the timetable. If finding the time for all teachers to meet is difficult, the school may be able to start with allocating CPD time by departmental level. The National Teacher CPD Framework should be disseminated to schools so that they get guidelines on how CPD should be conducted on the ground level.

### 4. Foster problem solving cycle between SCCs and DCC

DCC should be able to monitor and evaluate all SCCs' activities to enhance a problem-solving cycle from school to national level, and take action accordingly. All the SEOs visited suggested the importance of leadership at district level to create a favorable environment for CPD. This would be also the case in sector level, and the executive secretary should take part in improvement in education.

SEOs should share their SCC plan at the district level and report their activities on time. It is recommended that SCCs develop an annual action plan, and report implementation of activities through monitoring report form to be provided by REB. Districts should track the progress and give feedback. DCC meetings can serve as a community where members from different sectors share their plans, good practices to learn from each other, and challenges in order to get ideas to solve them. DCC meetings should also take place to discuss items to be coordinated across sectors.

# Appendix 14. DCC/SCC Quarterly Monitoring Report (3rd Quarter of 2019)

**DCC/SCC QUARTERLY MONITORING REPORT**
**PERIOD: 3rd QUARTER OF 2019**
**MONITORING DATE: 22nd October – 11th December**

## I. INTRODUCTION

In July 2016, REB requested districts and sectors to establish District CPD Committees (DCCs) and Sector CPD Committees (SCCs) in order to coordinate and support CPD which can maximize efficiency and effectiveness of teaching and learning.
Furthermore, the government embarked on strengthening CPD through various frameworks such as ESSP 2018/19-2022/23, which placed CPD on Strategic Priority 2, National Teacher CPD Framework, Teacher Statute and TDM policy. It also decided at a cabinet meeting in January 2019 that engagement in CPD shall be considered in advancing teachers' career path.
Effective monitoring system is now required for strengthening problem-solving cycle from school to national level. To this end, Teacher Training Unit (TTU) of the REB TDM&CGC Department in cooperation with JICA SIIQS Project developed the "concept note for monthly and quarterly DCC/SCC monitoring".
In accordance with the concept note, a monitoring team composed of TTU staff and JICA SIIQS Project team members conducted DCC/SCC quarterly monitoring visits for the third quarter of 2019 (July-September) to investigate their operation status, good practices and challenges. Quarterly monitoring visits were conducted in six districts, namely; Rutsiro, Rubavu, Ngororero, Ruhango, Huye and Kamonyi. These visits were conducted between 22 October and 11 December 2019.

## II. OBJECTIVES

The objectives of the 3rd DCC/SCC quarterly monitoring were the following;

1. To check functionality of DCC/SCC and CPD implementation progress at district, sector and school levels
2. Collect good CPD practices in details to be shared with other districts and sectors
3. Investigate challenges encountered by DCCs/SCCs so that REB can take measures in a timely manner
4. Promote understanding of importance of CPD monitoring among DCC/SCC members for establishment of sustainable monitoring system

## III. METHODOLOGY

Target sectors of the monitoring were sampled from the first batch of DCCs and SCCs workshops on planning, monitoring & evaluation, review & learning, reporting and performance feedback in October 2019. Basically, the districts which the Project had not visited for DCC orientation were selected.

The table below illustrates the sampled districts and sectors and dates of visit.

**Table 1: Sampled Districts**

| District | Names | Function | Date |
|---|---|---|---|
| Rustiro | NGENDAHIMANA Jacques | SEO/ Ruhango | 24/10/2019 |
| | NTABARESHYA Dieudone | SEO/Nyabirasi | 25/10/2019 |
| | BABONAMPOZE Leonidas | SEO/Mushonyi | 24/10/2019 |
| | UWIMANA Martin | SEO/Gihango | 23/10/2019 |
| Ngororero | TUYISHIME Jean Claude | SEO/Kabaya | 28/10/2019 |
| | HABUMUREMYI Theoneste | SEO/ Gatumba | 29/10/2019 |
| Ruhango | Eric | Acting DDE | 11/12/2019 |
| | NYIRAMFAMAHORO Beata | SEO/Kabagali | 30/10/2019 |
| | MUZUNGU Dinah | SEO/ Byimana | 29/10/2019 |
| Rubavu | KAYOBOTSI Emmanuel | SEO/Bugeshi | 22//10/2019 |
| | BIYINGOMA Turikunkiko Alphonse | SEO/Nyamyumba | 24/10/2019 |
| | HABARUGIRA Samuel | SEO/ Mudende | 21/10/2019 |
| Huye | MUHIRWE Protegene | DDE | 11/12/2019 |
| Kamonyi | KAYIJUKA Diogene | DDE | 11/12/2019 |

Basically, target persons were DDE in case of DCC, and SEO in case of SCC. The quarterly monitoring takes the form of semi-structured interview with target persons at their office so that they can refer to necessary information or show an evidence for responses. Interview sheets were prepared before.

In order to supplement the information from districts and sectors, the Project also conducted a questionnaire for CPD advisors dispatched to each district by IEE. The questionnaire includes the following nine questions.

**Table 2: Questions to CPD advisors**

| No. | Question |
|---|---|
| 1 | Has the DCC been established in your district? |
| 2 | When did the last DCC meeting happen? |
| 3 | What was the main topics at the last meeting? |
| 4 | When did the DCC organize a district-based CPD (if any) last time? |
| 5 | What was the topic of the district-based CPD activity (if any) last time? |
| 6 | How does the DCC manage budget issues? For example, who provides transportation fees for DCC members for meetings or CPD activities? Especially, who provides transportation fees for SEOs? How about necessary materials for meetings or CPD activities? |
| 7 | How often do SCCs report CPD activities to the DCC? (monthly, termly, never, every time they conducted activity, etc.). |
| 8 | How many SCCs regularly submit such reports to the DCC on average? |
| 9 | Has all sectors in your district established SCCs? |

Out of 30 districts, 19 CPD advisors responded to the questionnaire.

**Table 3: Respondents**

| | |
|---|---|
| **Districts whose CPD advisors responded** | Nyagatare, Gatsibo, Ngoma, Rwamagana, Nyarugenge, Burera, Gakenke, Musanze, Nyabihu, Rubavu, Ngororero, Karongi, Rutsiro, Nyamasheke, Nyaruguru, Huye, Nyanza, Ruhango, Kamonyi |
| **No response** | Kayonza, Kirehe, Bugesera, Gasabo, Kicukiro, Rusizi, Nyamagabe, Gisagara, Muhanga, Gicumbi, Rulindo |

## IV. FINDINGS FROM QUESTIONNAIRE FOR CPD ADVISORS

### 1. Establishment of DCCs and SCCs

According to 19 CPD advisors, DCCs have been established in their districts. SCCs have also been in place in many districts. The table below shows the establishment status of SCCs in each district. 232 out of 254 sectors (91.3%) based on valid responses had SCCs.

**Table 4: Establishment Status of SCCs**

| District | SCCs | # of sectors | Rate | District | SCCs | # of sectors | Rate |
|---|---|---|---|---|---|---|---|
| Nyagatare | 14 | 14 | 100% | Nyabihu | 12 | 12 | 100% |
| Gatsibo | 14 | 14 | 100% | Rubavu | 12 | 12 | 100% |
| Kayonza | No response | 12 | N/A | Ngororero | 13 | 13 | 100% |
| Ngoma | 6 | 14 | 43% | Karongi | 13 | 13 | 100% |
| Kirehe | No response | 12 | N/A | Rutsiro | 13 | 13 | 100% |
| Bugesera | No response | 15 | N/A | Nyamasheke | 15 | 15 | 100% |
| Rwamagana | 14 | 14 | 100% | Rusizi | No response | 18 | N/A |
| Gasabo | No response | 15 | N/A | Nyamagabe | No response | 17 | N/A |
| Kicukiro | No response | 10 | N/A | Nyaruguru | 14 | 14 | 100% |
| Nyarugenge | 10 | 10 | 100% | Huye | 14 | 14 | 100% |
| Gicumbi | No response | 21 | N/A | Gisagara | No response | 13 | N/A |
| Rulindo | No response | 17 | N/A | Nyanza | 10 | 10 | 100% |
| Burera | 17 | 17 | 100% | Ruhango | 9 | 9 | 100% |
| Gakenke | 19 | 19 | 100% | Muhanga | No response | 12 | N/A |
| Musanze | 1 | 15 | 7% | Kamonyi | 12 | 12 | 100% |
| | | | | **Total** | **232** | **416** | **55.8%** |
| | | | | **Valid responses** | **232** | **254** | **91.3%** |

### 2. DCC meetings and district level CPD activities

14 districts conducted DCC meetings in 2019. The recent meeting took place during the 2nd term and 3rd term in eight districts and five districts respectively. The main agenda was roles and responsibilities in many districts. Other districts discussed monitoring tools, annual plan, and training plans.

Regarding the CPD activities at the district level, not many districts conducted it. CPD took place at the sector-level rather than district level with the support from CPD advisors and other development partners (DPs). In most districts, SCCs conducted training of SBMs on a monthly basis.

### 3. Budget issues

Meetings and CPD activities may need budget such as transportation and lunch for participants. According to the CPD advisors, DCCs and SCCs did not have specific budget for the activities. They sometimes received support from DPs, mainly, Building Learning Foundation (BLF). In general, when there was a CPD activity at schools, SEOs use the budget allocated for monitoring. Schools and SEOs gave mission orders to teachers. In some schools, they were given capitation grant for transportation fees but there were also other schools whose teachers did not receive the fees.

## 4. Reporting

Even in the case of well-designed CPD, poor monitoring and reporting impede the effectiveness of professional learning and hinder its impact on student learning and achievement. Without a sense of what is functioning and why, it is hard to adopt and implement CPD for teachers that is evidence-based and designed to address potential obstacles. The creation of the online monitoring and reporting system for tracking CPD is underway. However, the system never works without data collection.

The frequency of reporting from SCCs to DCCs varies according to districts. The table below shows the frequency that districts agreed on.

**Table 5: Frequency of Reporting**

| Frequency | # of districts |
|---|---|
| Monthly | 4 |
| Quarterly | 5 |
| Termly | 1 |
| Every time CPD happened | 3 |
| Never established | 6 |

However, actual situation of reporting also depends on districts. 145 out of 254 SCCs (57.1%) have regularly reported their CPD activities to the DCCs in paper-form. There is a gap between the rate of SCC establishment and the rate of SCCs which report regularly.

**Table 6: Rate of SCCs that Report CPD Activities Regularly**

| District | SCCs | # of sectors | Rate | District | SCCs | # of sectors | Rate |
|---|---|---|---|---|---|---|---|
| Nyagatare | 14 | 14 | 100% | Nyabihu | 12 | 12 | 100% |
| Gatsibo | 14 | 14 | 100% | Rubavu | 12 | 12 | 100% |
| Kayonza | No response | 12 | N/A | Ngororero | 0 | 13 | 0% |
| Ngoma | 0 | 14 | 0% | Karongi | 0 | 13 | 0% |
| Kirehe | No response | 12 | N/A | Rutsiro | 13 | 13 | 100% |
| Bugesera | No response | 15 | N/A | Nyamasheke | 15 | 15 | 100% |
| Rwamagana | 5 | 14 | 36% | Rusizi | No response | 18 | N/A |
| Gasabo | No response | 15 | N/A | Nyamagabe | No response | 17 | N/A |
| Kicukiro | No response | 10 | N/A | Nyaruguru | 14 | 14 | 100% |
| Nyarugenge | 0 | 10 | 0% | Huye | 0 | 14 | 0% |
| Gicumbi | No response | 21 | N/A | Gisagara | No response | 13 | N/A |
| Rulindo | No response | 17 | N/A | Nyanza | 10 | 10 | 100% |
| Burera | 13 | 17 | 76% | Ruhango | 0 | 9 | 0% |
| Gakenke | 10 | 19 | 53% | Muhanga | No response | 12 | N/A |
| Musanze | 1 | 15 | 7% | Kamonyi | 12 | 12 | 100% |
| | | | | **Total** | **145** | **416** | **34.9%** |
| | | | | **Valid responses** | **145** | **254** | **57.1%** |

## V. FINDINGS FROM MONITORING VISITS

### 1. SCC Operation Status

#### A) SCC establishment

All visited SEOs confirmed that SCCs had been established.

#### B) SCC Plans

Even though SCCs have been established in all visited sectors, SCC plans existed only in four of them.
The table below shows the items that these SCCs planned.

**Table 7: Outline of SCC Plans**

| Sector | District | Planned Items |
|---|---|---|
| Kabagali | Ruhango | - Training<br>- Meeting at school and sector levels<br>- Need assessment<br>- Reporting |
| Byimana | Ruhango | - Peer learning lesson observation<br>- School based In service Training<br>- CoP<br>- Professional Learning Communities |
| Ruhango | Rutsiro | - Visiting school to help teachers about CPD<br>- Peer learning and dropout eradication |

#### A) SCC meetings

In DCC/SCC concept note, it is proposed that the SCCs meet at the end of each term to review the data collected. At this meeting, members discuss challenges faced, and any lack of action or lack of commitment to achieve the objectives of the action plan.
Out of 11 SCCs interviewed, the number of SCCs which met in the last term was six. It was likely to be hard for other SCCs to meet due to lack of transportation fee and commitment of members.

### 2. Good practices

The monitoring team found the following good practices.

#### A) School Visit

In Ruhango sector in Rutsiro district, the SCC monitor and review CPD activities by visiting school and checking the progress of CPD activities among teachers. It helps schools to resolve their problems in CPD implementation. All schools in the sector decided to meet for CPD at school every Friday.
Huye district also found model teachers in some schools and create opportunities for teachers from other schools to visit and observe their lessons on a termly basis. They use projectors to show recorded lessons for post-lesson reflection.

### B) Teacher training and reporting mechanism

During a SCC meeting in Byimana sector and Kabagali sector, Ruhango, members discussed lack of training and cooperation of teachers. They concluded that schools should organize the training themselves and conduct communities of practices (CoP). Especially in Kabagali sector, they emphasized on reporting mechanism issue. Now teachers meet and train each other as well as visit other schools to learn from one another. In Byimana sector, they now also have a reporting channel.

### C) Budget

Huye district confirmed that SEOs use budget for monitoring and schools use capitation grant when conducting DCC activities. The SIIQS project found that other districts also these resources to conduct activities.

Ruhango district was going to make the most of time and budget by combining many meetings together at one time. It is an effective and efficient way to use resources.

These examples suggest that even minimal and affordable financing encourages DCC and SCC members to process various CPD initiatives.

## 3. Challenges

The following are main challenges identified during the 3rd quarter DCC/SCC monitoring.

### A) DCC/SCC level

DCC Huye pointed out that involving parents in the DCC activities was a challenge. This challenge is common in many DCCs and SCCs. It is partly because the committees have difficulty in funding budget for the transportation and lunch for parent representatives. Budget is one of the most widespread problems.

Another reason for the low attendance of parents would be that they are not interested in teacher CPD and are busy with other duties.

Lack of time or overlapping of time has been also pointed by many DCCs and SCCs including Gatumba sector in Ngororero district and Nyabirasi sector in Rutsiro district. In the case where key members such as Vice Mayor and DDE (for DCCs) or Executive Secretory of sector and SEOs (for SCCs) place less priority on DCCs and SCCs, they may result in not conducting the activities so often as expected.

### B) School level

Challenges raised by visited districts and sectors were almost the same as those mentioned in the previous DCC/SCC quarterly monitoring reports: English proficiency of primary level teachers, insufficient formal training, overloaded timetables at schools, insufficient materials for CPD, lack of meeting rooms to gather, lack of motivation/resistance to change of teachers.

## VI. RECOMMENDATIONS

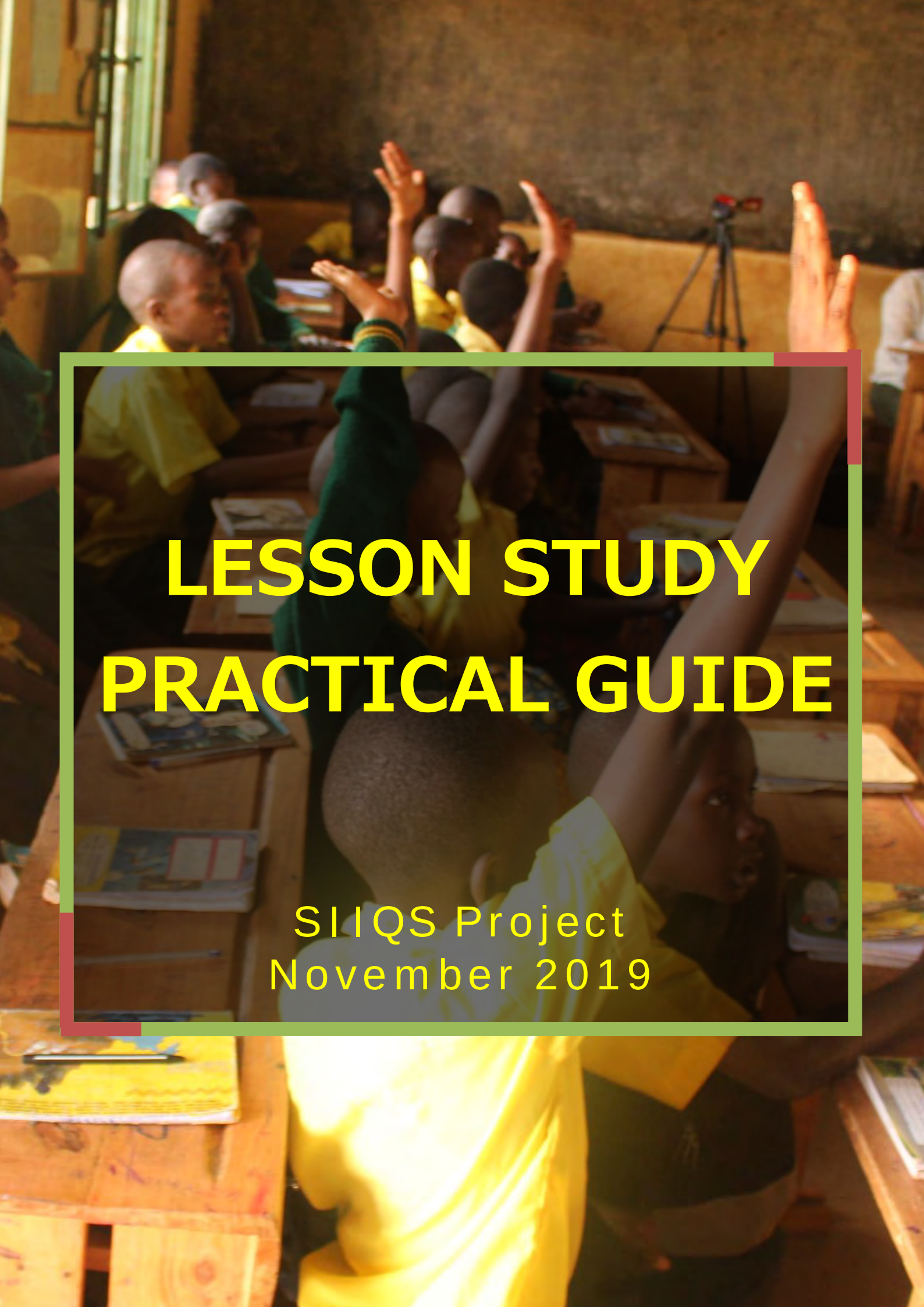
### 1. Encourage flexible funding

CPD is diversifying in Rwanda now. Various CPD approaches and methods are proposed and the variety definitely promotes active learning. To encourage teachers to be active learners, training providers and coaches should regularly update CPD methods and introduce new ideas in CPD so that teachers can continue CPD without getting burned out. Flexible funding enables such an active learning environment.

### 2. Harmonize monitoring effort

Driving the "Problem Solving Cycle" from school to national levels should be the key for success to nurture CPD across the country. Considering that more than half of the SCCs submit CPD reports to DCCs according to the questionnaire for CPD advisors, the online monitoring and reporting system that were being established now is likely to function. However, SEOs also submit paper-based monthly reports to MINEDUC which include all education issues in their respective sectors such as school facilities, drop-out rates, school hygiene and CPD. As the report form includes CPD, coordination between REB and MINEDUC to minimize duplication of SEOs' work and harmonize the system is crucial for effective and efficient monitoring.

# Appendix 15. Lesson Study Practical Guide



# LESSON STUDY PRACTICAL GUIDE

SIIQS Project
November 2019

# How to use the Lesson Study Practical Guide

This guide has been designed for District CPD Committees (SCCs), Sector CPD Committees (SCCs) and schools to understand the effectiveness of Lesson Study and to know how to put it into practice.
As a DCC/SCC member, you can use this guide to encourage schools to understand the effectiveness of Lesson Study and support them when there are challenges in implementation.
As a teacher, you can try to conduct Lesson Study by following the steps suggested in this guide.

*Effective teacher learning must be built into teachers' daily and weekly schedules*
*Schools must become the places where teachers, not just students, learn.*
Stigler and Hiebert (2009, p.37)

Your support and effort is greatly appreciated.


# Acknowledgement

This guide builds on the collaborative work in Lesson Study at six pilot schools of the SIIQS project, drawing on experience of and feedback from math and science teachers of these schools. The Project expresses its gratitude to the pilot schools and DCCs/SCCs which have supported CPD at these schools:

| | | |
|---|---|---|
| Gasabo District | : | GS Kabuye Catholique, DCC Gasabo, SCC Jabana |
| Kayonza District | : | GS Mukarange Catholique, DCC Kayonza, SCC Mukarange |
| Musanze District | : | GS Notre Dame des Apôtres Rwaza, DCC Musanze, SCC Remera |
| Rulindo District | : | EP Buhande, DCC Rulindo, SCC Bushoki |
| Rwamagana District | : | GS APAGIE Musha, GS St Aloys Rwamagana, DCC Rwamagana, SCC Musha, SCC Kigabiro |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# Introduction

## 1.1 What is Lesson Study?

**Lesson Study** is one of the Continuous Professional Development (CPD) activities to **improve the way teachers teach**. They work together in subject groups to research what happens in their lessons and to find solutions to improve their teaching. It is called "study" because it is an activity to verify effectiveness of a teaching approach, using evidence.

During Lesson Study, teachers **investigate the best teaching and learning methods for learners** in their school. In a live lesson, teacher-observers research how a lesson-giver's actions and facilitation, especially on specific problems (research topics) are effective in helping learners during lessons, and then report on the results so that all Lesson Study group members can benefit from it.

The Lesson Study process forms a continuous cycle.

## 1.2 History of Lesson Study in Japan

Lesson Study started in Japan more than 100 years ago after a new school system was introduced. Teachers wanted to apply better teaching methods for learners than the one the government recommended. Thus, they developed and proposed various teaching methods through Lesson Study Communities. Lesson Study has been conducted to date in Japan and expanded to other countries, serving various teaching approaches to the ever-changing education sector.

## 1.3 Effective CPD model

Darling-Hammond, Hyler and Gardner (2017) identified seven characteristics of effective teacher professional development. Lesson Study comprises all these features as shown in the table below.

**Table 1: Seven Characteristics of Effective Teacher Professional Development**

| Effective CPD Model Feature | Description | Interpretation in Lesson Study |
|---|---|---|
| **1: Is content focused** | Focuses on teaching strategies associated with specific curriculum content within teachers' classroom contexts. | Targets a specific lesson and develops a lesson plan |
| **2: Incorporate active learning** | Engages teachers directly in designing and trying out teaching strategies, while providing them an opportunity to engage in the same style of learning they are designing for their students. | Offers teachers active and participatory lesson planning, micro-teaching, research lesson and reflection |
| **3: Supports collaboration** | Creates space for teachers to share ideas and collaborate in their learning, often in job-embedded contexts | Encourages teachers to discuss and collaborate to develop lessons together. |
| **4: Uses models of effective practice** | Provides teachers with a clear vision of what best practices look like. | Applies a certain technique or model in the research lesson. |
| **5: Provides coaching and expert support** | Shares expertise about content and evidence-based practices, focused directly on teachers' individual needs. | Engages experts, DOS, SBM and SSL in CPD to give advices in the context. |
| **6: Offers feedback and reflection** | Provides built-in time for teachers to think about, receive input on, and make changes to their practice by facilitating reflection and soliciting feedback | Ensures the time for reflection and revision of the lesson plan both after micro-teaching and at the end of the program |
| **7: Is of sustained duration** | Provides teachers with adequate time to learn, practice, implement, and reflect upon new strategies that facilitate changes in their practice. | Consists of continuous plan, do and reflect cycle integrated in daily school life. |

# Lesson Study Steps

**How should we conduct Lesson Study at school?**

**Step 1: Research topic selection (2-3 hours)**

- ✓ Brainstorm to decide the necessary research topic (learning problems that learners currently face, challenges that teachers have with teaching etc.)
- ✓ Focus on Pedagogical Content Knowledge (PCK). PCK is a combination of what teachers know about teaching (pedagogical knowledge), and what they know about their subject (subject knowledge).

**Step 2: Lesson Design (A few weeks)**

- ✓ Conduct a study on the content of the unit
- ✓ Agree on a lesson schedule
- ✓ Develop a lesson plan and teaching materials with colleagues

### What is it?

Before starting Lesson Study, teachers form a Lesson Study group composed of those who teach the same subject or grades. One of them will deliver the research lesson on behalf of the group. Involvement of the school leaders (head teacher, deputy head teacher/director of study), and senior teachers (e.g. school subject leader/school-based mentor) and collaboration with them are highly desirable. It would be much better if the group can invite external resource persons such as the Sector Education Officer (SEO) and development partners. Then, the group decides on a problem to be addressed and the research lesson topic. The topic should be chosen from challenging ones for learners to learn and/or for teachers to teach. It is also possible to give some quizzes and identify learners' weak areas. Members agree on the research topic by discussing what pedagogical problem to solve, and what to achieve through Lesson Study. They should focus on Pedagogical Content Knowledge (PCK), a combination of what teachers know about teaching (pedagogical knowledge), and what they know about their subject (subject knowledge). Subsequently, they brainstorm as many practical measures and strategies as possible to solve the identified problem.

### What is it?

The second step is lesson design. Ideally, it starts about a month before the research lesson, as it may take a few weeks. Members conduct a study on the content of the topic, including a study on any connections with topics learned previously and those to be learned in the future, by referring to the Scheme of Work, syllabus and textbook. It is important to be aware of the expected date of the research lesson and class, and agree on the schedule for the day. Teachers should write down as detailed as possible when developing a lesson plan collaboratively in the group. Above all, they are expected to incorporate learners' perspectives – that is, to include possible learners responses to the teacher's action. They may question themselves, for example:

- *How are learners likely to think about this?*
- *What ideas are they likely to have?*
- *What questions are they likely to ask?*
- *What misunderstandings or mistakes are they likely to make?*

During the lesson design period, the Lesson Study group also develops/prepares the necessary teaching aids (flash cards, posters, materials for an experiment/observation etc.).

# Lesson Study Steps

### Step 3: Lesson Practice (Micro-teaching) (A few weeks)

- ✓ One teacher rehearses the lesson. Micro-teaching (role-play) is often used to do this, with one group member acting as the teacher and the others acting as learners.
- ✓ After micro-teaching, the group gives feedback on the lesson plan focusing on the research topic and they revise it collectively.

### What is it?

After development of the lesson plan, it is recommended that the teacher practices developing a specific teaching method and to verify that it can work well before the actual lesson delivery. Micro-teaching is often used for these purposes at this stage. The teacher teaches the planned lesson to other group members who act as learners. It can be a whole lesson or the group can only examine a certain component of the lesson plan (i.e. for a period of five to ten minutes). Micro-teaching can even be done with a small group of actual learners, if conditions permit, to get real reactions from them. In this case, other members of the Lesson Study group observe the micro-teaching.

After the micro-teaching, the group discusses what went as expected and what did not, and make modifications on the lesson plan. If group members can take photos or video recording during the micro teaching, these can be useful content for discussion. This process continues until the group confirms/observes achievement of the learning objective in micro-teaching.

### Step 4: Research Lesson (Lesson Implementation) (1 period)

The representative teacher delivers the lesson in an actual class and other members observe it by using a lesson observation form. Observers should;

- ✓ Observe the achievements of learners with regards to the research topic
- ✓ Move around the classroom to check how learners learn and to record observations (evidence) for discussion in the Reflection stage.

### What is it?

It is time to deliver the lesson to an actual class. The teacher delivers, while others observe. This is called “research lesson” because teachers analyze the effectiveness of a teaching method from lesson observation.

To make the most of the research lesson, learners should be made aware of the purpose of the research lesson and roles of observers. When there are observers who did not participate in the steps of Lesson Study, pre-lesson briefing may be useful. Providing photocopies of the lesson plan for observers would help them quickly understand.

The pre-lesson briefing can include:

- The schedule and flow for the day
- Information about the class (learners’ performance level, what they should already know with regards to the topic, and any prior activities on the topic, etc.)
- Sharing the lesson plan

A sample of the lesson observation form is attached in Appendix 1.

### Guide to Observers

It is important that lesson observation in Lesson Study is not associated with assessing teachers. Lesson Study is an opportunity for a teacher to try something new, from which everyone will learn.

Below is the guide to observers about the research lesson.

Reference: Guide for professional development using Lesson Study (based on problem solving with Bowland Maths materials) https://www.bowlandmaths.org.uk/lessonstudy/guide.html

### Step 5: Reflection (Post-lesson conference) (2-3 hours)

Reflect on the observed lesson by using a post lesson conference (ideally right after the observation).

- ✓ Give feedback on the research topic based on observation results,
- ✓ Discuss alternative ideas to address issues raised during the feedback session,
- ✓ Review the entire process of Lesson Study itself.

The Lesson Study group makes a Lesson Study report later.

### How should we observe?

- Read the lesson plan before classroom observation.
- Observe the learners learning that is taking place and do not make judgements about the teaching of the teacher.
- Focus on;
  - ➢ learners learning
  - ➢ time management
  - ➢ class management
  - ➢ use of teaching materials (textbooks, ICT, locally available materials etc.)
  - ➢ lesson objectives achieved or not?
- Refrain from talking to the learners or interfering with group discussions.
- Move around the classroom to constantly check how learners learn.
- Make notes and record observations (evidence) for discussion in the Reflection stage.

### What is it?

The reflection or post-lesson discussion should take place on the same day and in the same classroom as the research lesson.

The discussion can be comprised of four parts;

1. The Lesson Study group describes the lesson plan, which parts they carefully designed and the reasons behind it.
2. The observers describe what they observed in relation to the research topic (the problem to be addressed).
3. A wider discussion including issues other than the research topic to enable suggestions for any revisions of the lesson plan and implication for future lessons.
4. Resource persons such as the SEO and development partners highlight key points and suggest improvements.

## *Lesson Study is a Continuous Learning Process…*

A reflection in Lesson Study leads to a plan for the next Lesson Study even if the subject or topic changes. As teachers work together to conduct Lesson Studies, experience as a school is accumulated. Therefore, not only the performance of one teacher can be enhanced, but also the teaching level of entire school is expected to improve.

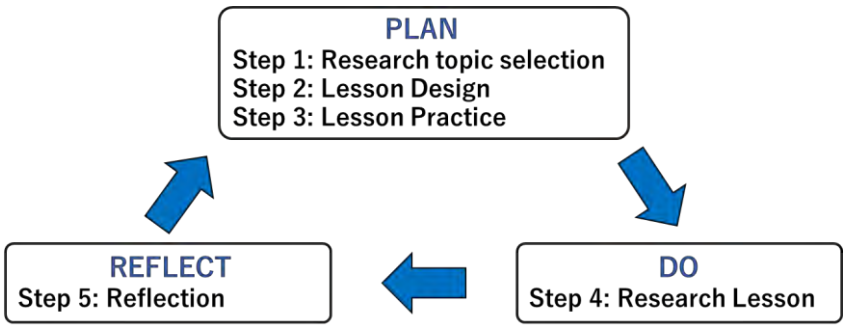


**Figure 1: Continuous Lesson Study Process**

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# Experience at Pilot Schools

SIIQS Project supported six pilot schools in implementing Lesson Study in math and science in 2017 to 2019.

**Table 2: List of Pilot Schools**

| School | District | Category | # of Lesson Study cycles conducted |
|---|---|---|---|
| EP Buhande | Rulindo | Primary | 4 |
| GS Kabuye Catholique | Gasabo | 9 year basic education | 2 |
| GS Mukarange Catholique | Kayonza | 12 year basic education | 3 |
| GS St Aloys Rwamagana | Rwamagana | Secondary | 1 |
| GS APAGIE Musha | Rwamagana | Secondary | 4 |
| GS Notre Dame des Apôtres Rwaza | Musanze | Secondary | 3 |

The following sections are findings from the Project Endline Survey in June 2019, which compared the status of teaching and learning between six pilot schools and five non-pilot schools (See Table 3 for the sample size).

**Table 3: Sample Size of the Project Endline Survey**

| Survey items | Pilot Schools | | | | Non-pilot schools | | | |
|---|---|---|---|---|---|---|---|---|
| | Primary | Lower Secondary | Upper Secondary | **Total** | Primary | Lower Secondary | Upper Secondary | **Total** |
| Lesson plan | 6 | 9 | 8 | **23** | 6 | 6 | 2 | **14** |
| Lesson video | 6 | 9 | 8 | **23** | 6 | 8 | 4 | **18** |
| Learning Achievement Test | 422 | 449 | 442 | **1,313** | 499 | 374 | 160 | **1,033** |
| Questionnaire for teachers | | | | **55** | | | | **46** |

# Lesson Study Improves Teaching Practice

## Lesson Planning

In the National Teacher CPD Framework, lesson plans should include the following information (See Competence 2.1 of the Framework for more details);

- Clear and measurable learning outcomes and objectives, and activities to achieve them
- Learning outcomes and objectives support learners to move from simple and familiar to more complex and sophisticated knowledge and skills
- Regular revision of learning and learning assessments
- Adaptions for specific learners who, for example, require where extra guidance or extension tasks
- Use a range of teaching learning resources and vary interaction patterns
- Classroom layout to ensure all learners can participate and learn

Source: Rwanda Education Board. (2019).

As a result of Lesson Study, lesson plans of the pilot schools have become more structured, specifying the **steps of the learning activity** in the "Description of teaching and learning activity" section. Activities of both the teacher and learners were arranged in sequence. They contain "**expected (correct) answers of learners**" so that a teacher and observers can properly assess learning achievement timely during the lesson. These activities, as well as those in the "Assessment" section were also consistent with the objectives of the lesson. **Teaching aids are graphically illustrated** in the plans.

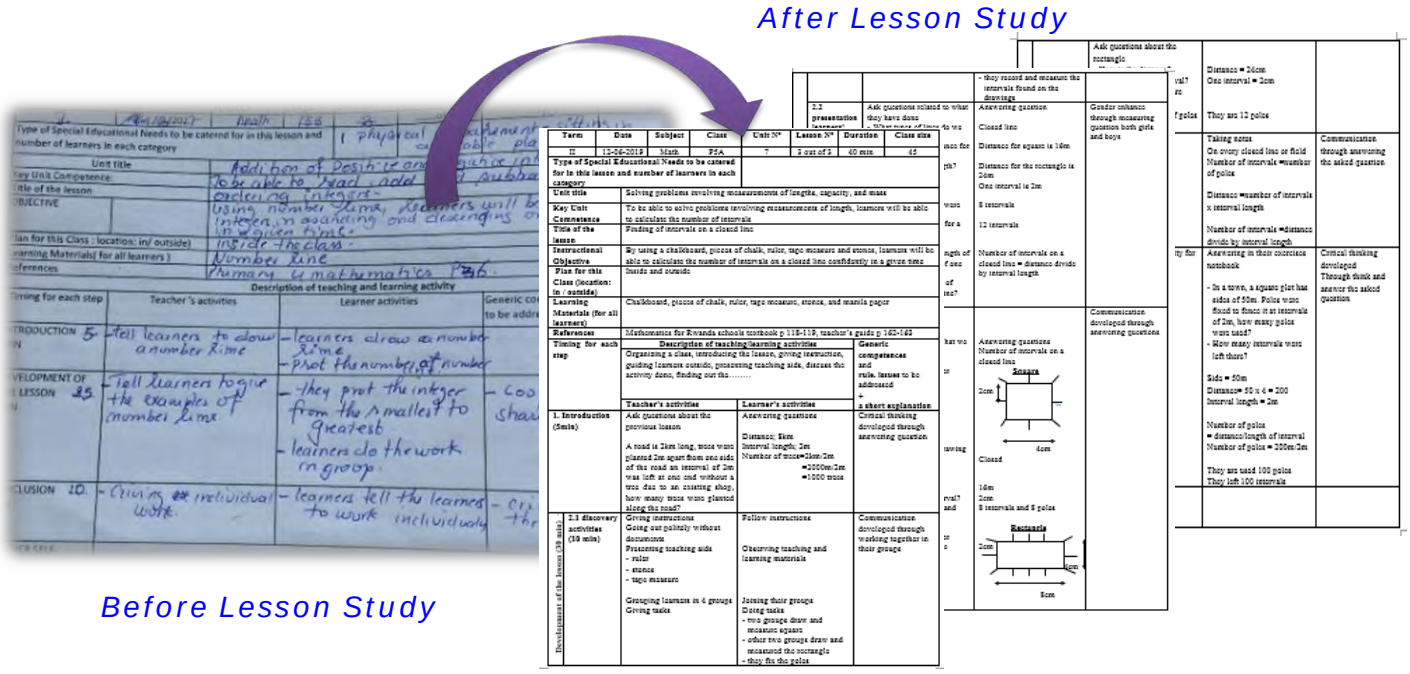



**Figure 2: Lesson Plans Before and After Lesson Study**

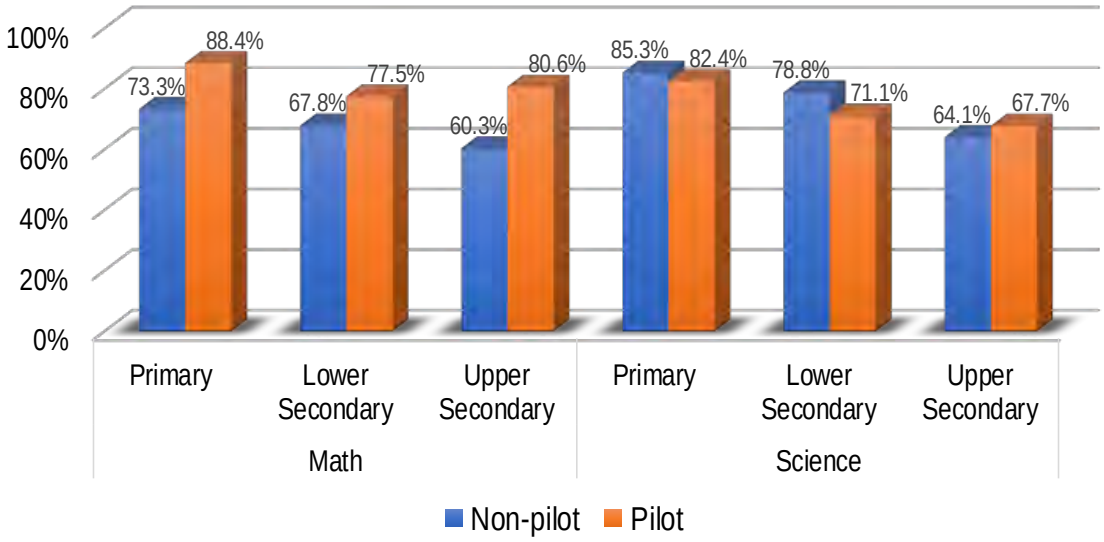
Two examples of the lesson plans developed by pilot school teachers are attached in Appendix 2, with comments on good points.

## Teachers' Facilitation

A teacher uses lessons to teach necessary subject matter and support learners in learning. We assumed that a teacher who became familiar with **Learner-Centered Methodology** through Lesson Study used more dialogue towards learning support and less for teaching. To verify this assumption, we conducted a discourse analysis of math and science lessons at pilot and non-pilot schools by transcribing and classifying teacher talks into codes. The codes were then categorized into *Learning support*, *Teaching* and *Others* according to the nature of the talks. The classification is shown in the box below.

| |
|---|
| **Learning Support Codes**: Closed Question, Open Question, Rephrase teacher, Rephrase student, Confirmation, Instruction, Encouragement |
| **Teaching Codes**: Explanation, Justification |
| (**Others**: Call attention, Point student, Clap, Impossible to listen, Others) |

The average frequency of "Learning Support" codes is illustrated in Figure 3. The rate of "Learning Support" code frequency in the pilot schools is higher than that in the non-pilot schools with some exceptions in science in primary and lower secondary levels. This implies that teachers in the pilot schools used more open dialogue to support learning, whereas teachers in the non-pilot schools directly taught subject matters. The teachers at the pilot schools improved facilitation skills and applied "**Indirect Teaching**", the ideal pedagogy in CBC, which gives learners opportunities to participate in their learning while teacher serves as a guide.




NB: "Others" codes were eliminated from this analysis to focus on essential classroom practice.

**Figure 3: Rate of Learning Support by Intervention and School Level**

### Examples of Open Questions

The following are examples of open questions that can encourage learners to think deeply.

The square has fifty meters. This fifty meter's side is 50m. How can we calculate the distance or the perimeters of that square? (Math in primary level)

A person is sitting on the chair. Between the person and the chair, which one is exerting the force on the other? Explain your answer based on Newton laws of motion. (Science in secondary level)

# Lesson Study Improves Learners' Performance

## Open-ended Responses

As teachers in the pilot schools applied indirect teaching more, the average frequency of open-ended responses was higher in the pilot schools with an exception in math in primary level (Figure 4). Overall, learners in the pilot schools were given more opportunities to express their broader ideas than in the non-pilot schools.

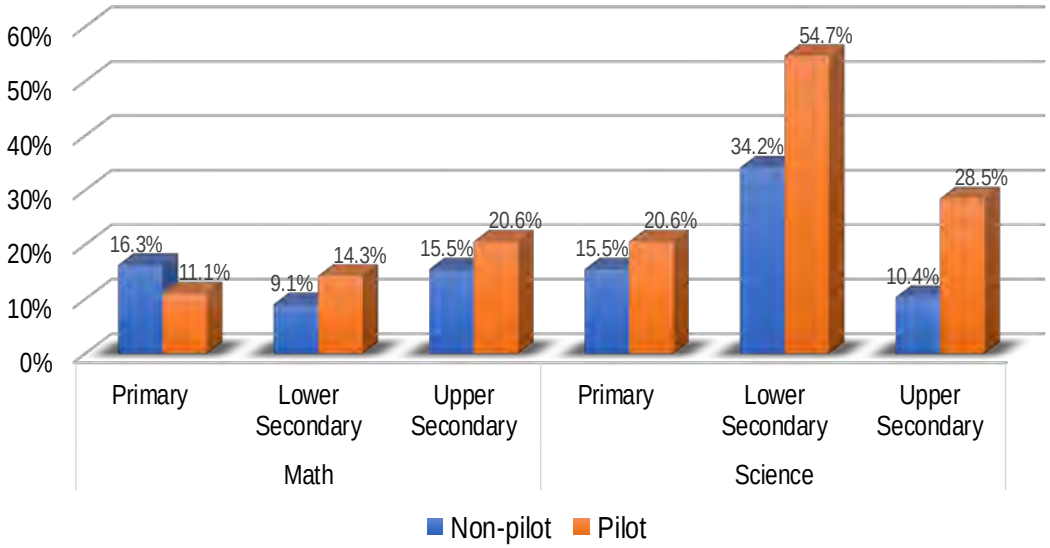



**Figure 4: Rate of Open-ended Responses by Intervention and School Level**

## Interaction among Learners

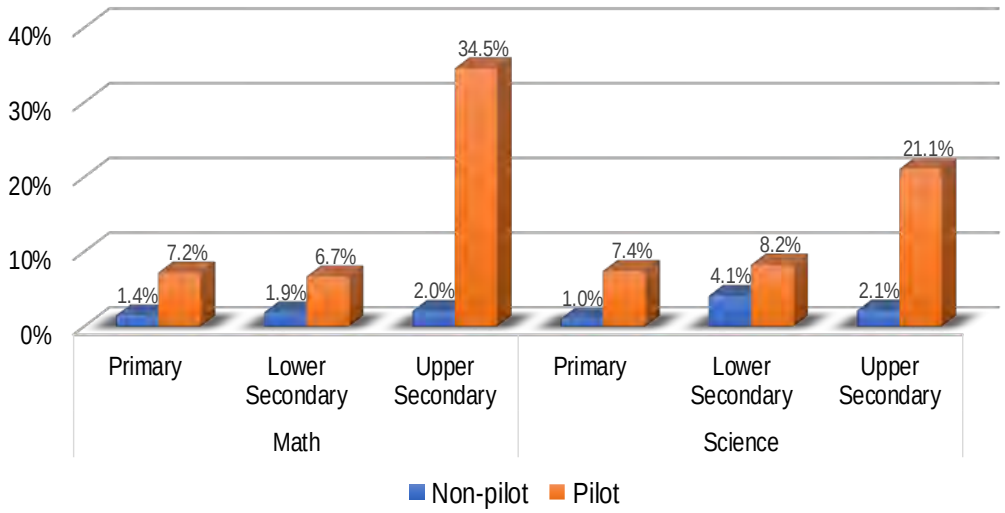
We also assumed that Learner-Centered Methodology activates more communication among learners compared to "teacher-centered lesson" where learners just respond to teachers. We thus, transcribed and classified learners' talks into codes. The codes were then categorized into *To teacher* and *To students* according to the direction of the talks, as well as *Others*. The classification is shown in the box below.

**To Teacher Codes**: Yes / No answer to teacher, One term answer to teacher, Question to teacher, Opinion to teacher, Repeating or just reading, Silent to teacher, Writing or gesture to teacher

**To Students Codes**: Yes / No answer to another student, One term answer to another student, Question to another student, Opinion to another student, Silent to another student, Presentation, Writing or gesture to another student

(**Others**: Point student, Clap, Incomplete answer, Impossible to listen, Others)

We found similar trends both in mathematics and science. The rate of "To students" code frequency in the pilot school is higher than that in the non-pilot schools at all levels as shown in Figure 5. It implies that communication among students in the pilot schools was more active, whereas students in the non-pilot schools tended to communicate directly with the teacher.

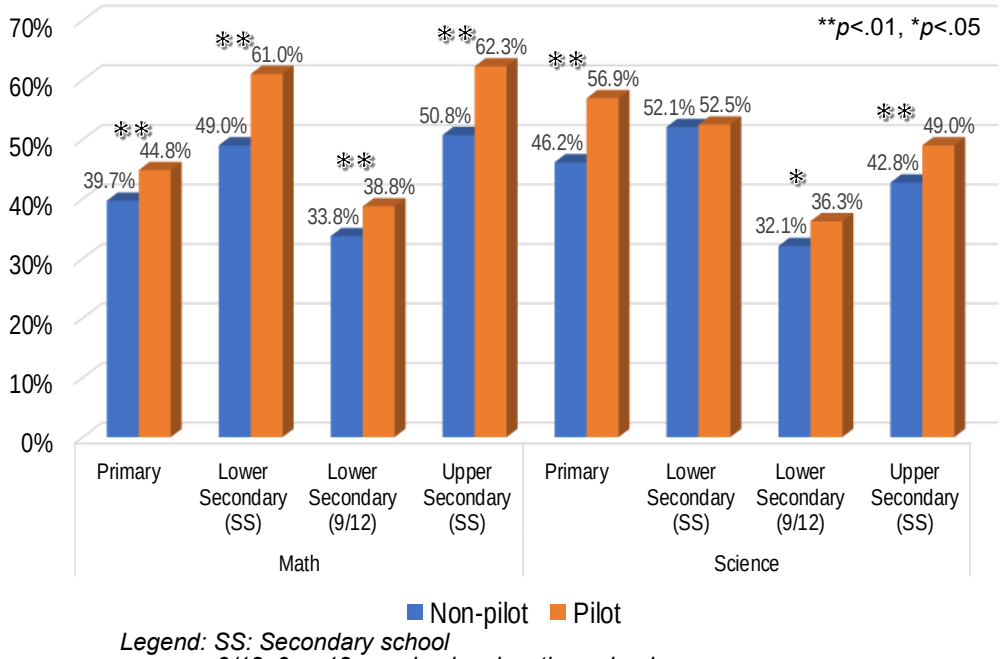



NB: "Others" codes were eliminated from this analysis to focus on essential classroom practice.

**Figure 5: Rate of Interaction among Learners by Intervention and School Level**

## Learning Achievement

The Project designed multiple-choice type mathematics and science tests for P6/S3/S6 learners at the pilot and non-pilot schools. The questions in the tests were basically chosen from new CBC-based textbooks authorized by REB, and some were selected from major international assessment tests such as Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA). The questions covered content up to P4, S1 and S4 for primary, lower secondary and upper secondary level tests respectively. Figure 6 shows average scores of the tests by intervention (pilot/non-pilot) and school levels.




*Legend: SS: Secondary school*
*9/12: 9 or 12 year basic education school*

**Figure 6: Learning Achievement Test Results by Intervention and School Level**

In mathematics, the average scores of the pilot schools were significantly higher than those of the non-pilot schools. In science, the average scores of the pilot schools were significantly higher than those of the non-pilot schools at all levels except for the lower secondary level at secondary schools. The results imply that the "indirect teaching" induced by Lesson Study improved learners' performance of the pilot schools.

# Lesson Study Changes Teachers' Belief

## Understanding of CBC

The Project investigated how teachers in the pilot and non-pilot schools understood specific teaching behaviors. Questions were prepared based on "misconceptions" confirmed by the Project throughout the project activities. Likert Scale questions (on a four-level grading scale; strongly disagree, disagree, agree, strongly agree) were given to teachers to rate their degree of agreement. Figure 7 shows the rate of teachers who understood specific teaching behaviors in a desirable direction. For instance, for Q1, 92.6% and 84.8% of teachers in the pilot and non-pilot schools respectively answered that they "strongly disagree" or "disagree" with the statement. The pilot school teachers understood the teaching behavior properly. The pilot school teachers' responses suggest that they changed their perception or awareness of CBC in a desirable direction.

### Preferable Answers to the Questions about Teaching Behavior

Q1: When students do not understand a concept, it is because students do not study harder.
A1: Disagree. Learners' understanding also depends on teaching quality and encouragement by the teacher.

Q2: When students do not understand a learning concept, it is because the teacher did not use effective L/T strategies.
A2: Agree. Lesson quality assurance is primarily the teachers' obligation.

Q3: When a student gives a wrong answer, teacher should call another student to get correct answer immediately.
A3: Disagree. The reason behind the wrong answer is meaningful for formative assessment.

Q4: Teachers should rely on students' oral responses than students' face expressions and behaviors for formative assessment.
A4: Disagree. Teachers need to observe and collect various information to conduct formative assessment.

Q5: Blackboard writing should be erased when students solve assessment question at the end of a lesson.
A5: Disagree. The assessment at the end of the lesson is not the occasion for recalling of knowledge learned but for applying the knowledge learned to solve problems.

Q6: Lesson conclusion should be given by teacher.
A6: Disagree. The new knowledge learned should be constructed by learners.

Q7: CBC should always include group work.
A7: Disagree. Teachers in CBC are encouraged to use various suitable techniques not only group work.

Q8: To treat learners equal, teachers should provide the same instruction to all learners regardless of their understanding.
A8: Disagree. Teachers in CBC are encouraged to choose suitable instructions according to individual learning needs to be inclusive.

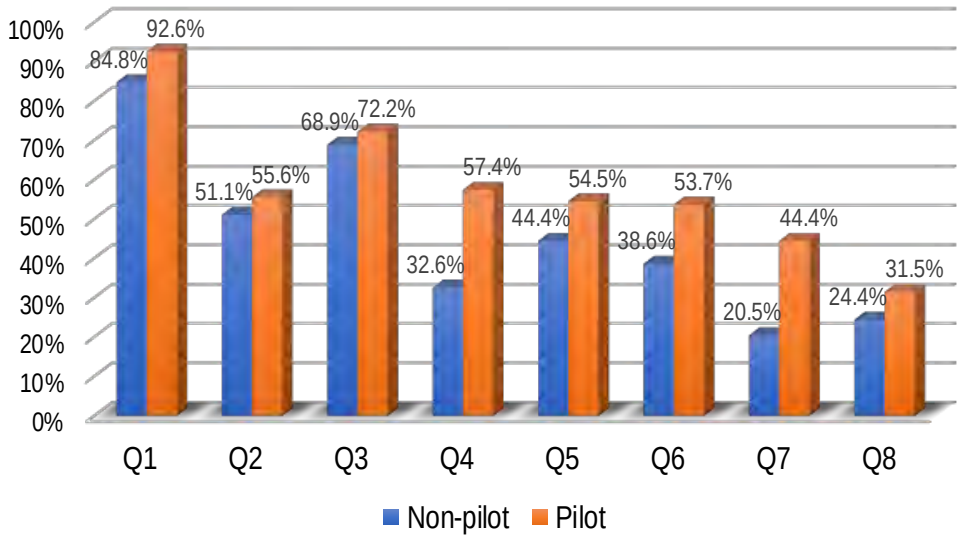



**Figure 7: Rate of Teachers who Understood Specific Teaching Behaviors in a Desirable Direction**

## Perception about School Circumstances

### Five Factors influencing teachers' participation in CPD

The Project conducted an exploratory factor analysis in 2017 to investigate characteristics of teachers who did not attend trainings. It uncovered five factors and highlighted the importance of supporting an environment that encourages teacher participation in CPD.

**Five factors influencing teachers' participation in CPD**

**Factor 1: Shared School Vision**

**Factor 2: Participatory School Management**

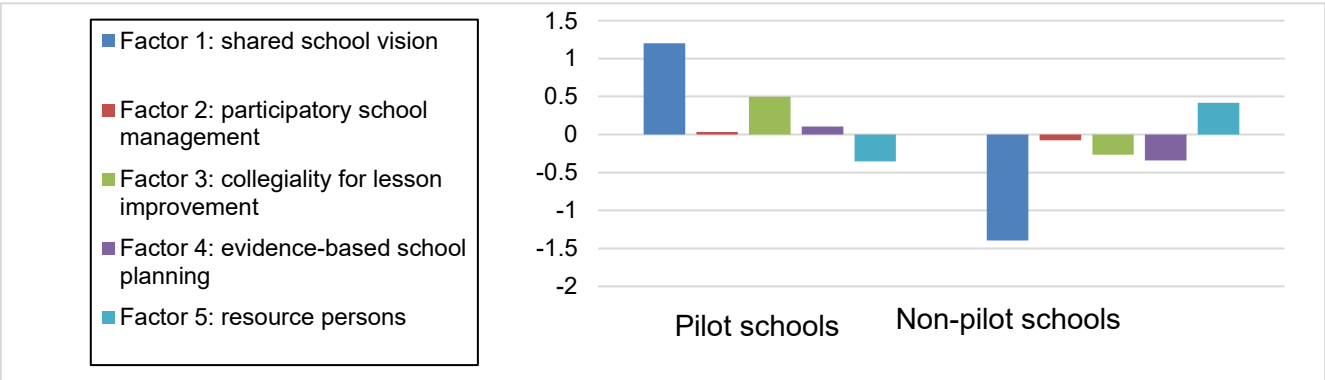
**Factor 3: Collegiality for Lesson Improvement**

**Factor 4: Evidence-based School Planning**

**Factor 5: Resource Persons**

### Findings from the Exploratory Factor Analysis

Figure 8 shows the factor scores by intervention (Pilot/Non-pilot), using teachers' responses to questions related to school circumstances. The pilot school teachers' scores for Factor 1 (shared school vision) and Factor 3 (collegiality for lesson improvement) were positive in contrast to the non-pilot school teachers' scores, while the score for Factor 5 (resource persons) was negative. Lesson Study may have contributed in transforming school visions into clear missions about teaching practices. Undoubtedly, it also promoted collegiality through collaboration. These results certainly verify the effectiveness of Lesson Study.




NB: The negative score for Factor 5 for pilot school teachers may imply that SBMs and SSLs had less of a chance to play a leading role in CPD because the project members served as resource persons in this Lesson Study program.

**Figure 8: Factor Scores by Intervention**

**Quotes from literature about Lesson Study**

*Lesson study is a comprehensive program that can provide teachers with opportunities for practice-based professional development that, until now, they have been denied. – Stigler and Hiebert (1999, p.152) –*

*The lesson-study process has an unrelenting focus on student learning. All efforts to improve lessons are evaluated with respect to clearly specified learning goals, and revisions are always justified with respect to student thinking and learning. – Stigler and Hiebert (1999, p.121) –*

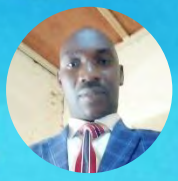
# Teachers & Education Officer's Voices about Lesson Study

UJENEZA Seraphine
Math teacher,
EP Buhande

Lesson study has given me an opportunity to learn from colleagues to improve my lessons and learners' outcomes. Making an effective lesson plan is one of benefits that I have gained from the Lesson Study program. It has made me a self-confident teacher in front of both learners and entire community

KANAMUGIRE Pascal
Head teacher,
GS Mukarange Catholique

Lesson Study has been a good opportunity for teachers to sit together to discuss issues in the teaching and learning process, challenge one another and learn from each other. Lesson Study is certainly helping in transforming curriculum to competences.



HITIYISE J Damascène
Director of Study,
APAGIE Musha

Teachers' attitudes and behaviors have gradually improved and we can attribute this improvement to Lesson Study. Throughout the course of Lesson Study, teachers have been able to open and reveal their weaknesses and welcomed their fellow teachers for support.

NUWAYO Jean Denys
DDE Rulindo

Lesson Study has promoted sharing and collaboration among teachers. Newly recruited teachers learn from experienced teachers. Even experienced teachers learn how to adapt themselves to change. CBC implies that teachers should change their behavior and attitude. Lesson Study helps teachers to focus on their subject and figure out how to teach challenging topics.

# Solutions to Some Challenges

**Q1** Should we always include group work in CBC lessons?

**A1** It is not necessary to use group work in all lessons. Teachers should be encouraged to use different methods depending on the advantages, such as individual work, solve an example question as a whole class with the teacher's guided instruction, as well as group work.

**Q2** How can we address teachers who are reluctant to participate in CPD including Lesson Study?

**A2** The main reason for such an attitude may be that they do not really understood what they would benefit from participating in CPD. School leaders and School-based Mentors can convince them by explaining the benefits of CPD including Lesson Study.

**Q3** How can our school secure CPD time in the teachers' timetable?

**A3** The following are examples of some schools putting CPD time in the timetables.

- Conduct CPD time when learners clean the school
- Set CPD time by department levels (teachers in the same department have CPD time in the same periods)
- Manipulate teachers' timetables and create one day without teaching duties per week so that they can spend the day planning lessons, marking, etc.

**Q4** How can we get budget for Lesson Study?

**A4** Lesson Study basically take place at school level, using available resources. Therefore, there should not need much budget. But it would be good if the school uses capitation grant and provides facilitation such as lunch, transportation when necessary.

Appendix 1: Sample of Lesson observation form

## LESSON OBSERVATION FORM

**School name**: …… **Teacher's name**: ……

**Class**: ……..… **Number of learners**: .....out of….. **Number of learners with SEN**: … **Subject**: …….…….

**Unit title**: …… **Lesson title**: …….……...

**Lesson nº**…… out of …… **Period**: …….. **Date**: …….……..

**Note: Please focus on learners learning, time management, class management and use of teaching materials (textbooks, ICT, locally available materials, etc.).**

| Phase | Observation on teacher's activities | Observation on learners' activities |
|---|---|---|
| **Introduction** | | |
| **Development** | | |
| **Conclusion** | | |

**Analysis and feedback**

| | Observation on teacher's activities | Observation on learners' activities |
|---|---|---|
| **Strong Points** | | |
| **Areas for Improvement** | | |

Appendix 2: Example of a lesson plan (P5 math)

**LESSON PLAN**

**School Name**: XXXXXXXXX **Teacher's name**: XXXXXXXX

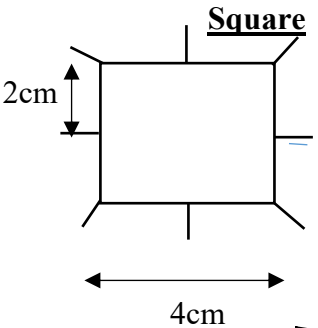
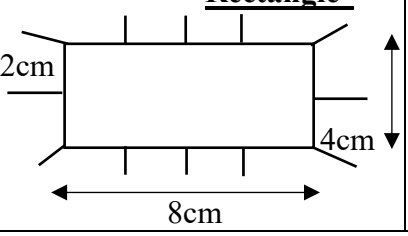
| **Term** | **Date** | **Subject** | **Class** | **Unit Nº** | **Lesson Nº** | **Duration** | **Class size** |
|---|---|---|---|---|---|---|---|
| II | 12-06-2019 | Math | P5A | 7 | 3 out of 3 | 40 min | 45 |
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | | | | | | | |
| **Unit title** | Solving problems involving measurements of lengths, capacity, and mass | | | | | | |
| **Key Unit Competence** | To be able to solve problems involving measurements of length, learners will be able to calculate the number of intervals | | | | | | |
| **Title of the lesson** | Finding of intervals on a closed line | | | | | | |
| **Instructional Objective** | By using a chalkboard, pieces of chalk, ruler, tape measure and stones, learners will be able to calculate the number of intervals on a closed line confidently in a given time | | | | | | |
| **Plan for this Class (location: in / outside)** | Inside and outside | | | | | | |
| **Learning Materials (for all learners)** | Chalkboard, pieces of chalk, ruler, tape measure, stones, and manila paper | | | | | | |
| **References** | Mathematics for Rwanda schools textbook p 118-119, teacher's guide p 162-163 | | | | | | |

| **Timing for each step** | | **Description of teaching/learning activities** | | **Generic competences** and **rule. issues** to be addressed + **a short explanation** |
|---|---|---|---|---|
| | | Organizing a class, introducing the lesson, giving instruction, guiding learners outside, presenting teaching aids, discuss the activity done, finding out the…….. | | |
| | | **Teacher's activities** | **Learner's activities** | |
| **1. Introduction (5min)** | | Ask questions about the previous lesson<br><br>A road is 2km long, trees were planted 2m apart from one side of the road an interval of 2m was left at one end without a tree due to an existing shop, how many trees were planted along the road? | Answering questions<br><br>Distance; 8km<br>Interval length; 2m<br>Number of trees=2km/2m<br>=2000m/2m<br>=1000 trees | Critical thinking developed through answering question |
| **Development of the lesson (30 min)** | **2.1 discovery activities (10 min)** | Giving instructions<br>Going out politely without documents<br>Presenting teaching aids<br>- ruler<br>- stones<br>- tape measure<br><br>Grouping learners in 4 groups<br>Giving tasks | Follow instructions<br><br>Observing teaching and learning materials<br><br>Joining their groups<br>Doing tasks<br>- two groups draw and measure square<br>- other two groups draw and measured the rectangle | Communication developed through working together in their groups |

Concreate guiding questions and expected outputs engage learners in lesson

Outside activities with various materials provide exclusive learning experiences

Appendix 2: Example of a lesson plan (P5 math)

| | | | | |
|---|---|---|---|---|
| | | | - they fix the poles<br>- they record and measure the intervals found on the drawings | |
| | **2.2 presentation learners' findings production (10 min)** | Ask questions related to what they have done<br>- What types of lines do we have?<br>- How long is the distance for squares?<br>- How long is one length?<br><br>- How many intervals were left for square?<br>- How many were left for a rectangle?<br><br>- By considering the length of distance and length of one interval how can we calculate the number of intervals on a closed line? | Answering question<br><br>Closed line<br><br>Distance for square is 16m<br><br>Distance for the rectangle is 24m<br>One interval is 2m<br><br>8 intervals<br><br>12 intervals<br><br>Number of intervals on a closed line = distance divide by interval length | Gender enhance through measuring question both girls and boys |
| | **2.3 exploitation findings production (5 min)** | Tell pupils to enter a classroom<br><br>Ask questions about what we have studied outside<br><br>Presenting manila paper where written square<br><br>Ask questions about drawing<br>- Is that figure open or closed?<br><br>- What is its distance?<br>- How long is one interval?<br>- How many intervals and poles are there?<br><br>Presenting manila paper where written rectangle | Answering questions<br>Number of intervals on a closed line<br><br>**Square**<br>  <br><br>Closed<br><br>16m<br>2cm<br>8 intervals and 8 poles<br><br>**Rectangle**<br>  <br> | Communication developed through answering questions<br><br>Clear images allow learners to move from simple to more complex knowledge, skills and concepts |

Appendix 2: Example of a lesson plan (P5 math)

| | | | | |
|---|---|---|---|---|
| | | Ask questions about the rectangle<br>- How is the distance?<br>- How long is one interval?<br>- How many intervals are there?<br>- Finding the number of poles there are | Distance = 24cm<br>One interval = 2cm<br><br>They are 12 poles | |
| | **2.4 conclusion/ summary (5min)** | Create summary with learners<br><br>Summary is constructed with learners so that learners use higher order thinking skills to retain new knowledge. | Taking notes<br>On every closed line or field<br>Number of intervals =number of poles<br><br>Distance =number of intervals x interval length<br><br>Number of intervals =distance divide by interval length | Communication through answering the asked question |
| **3. assessment (5min)** | | Giving individual activity for evaluation | Answering in their exercises notebook<br><br>- In a town, a square plot has sides of 50m. Poles were fixed to fence it at intervals of 2m, how many poles were used?<br>- How many intervals were left there?<br><br>Side = 50m<br>Distance= 50 x 4 = 200<br>Interval length = 2m<br><br>Number of poles<br>= distance/length of interval<br>Number of poles = 200m/2m<br><br>They are used 100 poles<br>They left 100 intervals | Critical thinking developed<br>Through think and answer the asked question |
| **Observation of lesson** | | | | |

Appendix 2: Example of a lesson plan (S2 biology)

**LESSON PLAN**

**School Name**: XXXXXXXXX **Teacher's name**: XXXXXXXX

| **Term** | **Date** | **Subject** | **Class** | **Unit Nº** | **Lesson Nº** | **Duration** | **Class size** |
|---|---|---|---|---|---|---|---|
| 2 | 17/06/2019 | Biology | S2A | 6 | 3 of 6 | 80min | 50 |

| | |
|---|---|
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | Take care of slow learners |
| **Unit title** | Enzymes |
| **Key Unit Competence** | To be able to explain the roles of enzymes in living organisms and how they are affected by temperature and pH. |
| **Title of the lesson** | Characteristics of enzymes |
| **Instructional Objective** | By using textbooks, learners should accurately describe the characteristics of enzymes based on enzymes made of substances and substrates |
| **Plan for this Class (location: in / outside)** | Computer laboratory |
| **Learning Materials (for all learners)** | Student's books, manila paper, and marks |
| **References** | Student's book |

| **Timing for each step** | **Description of teaching/learning activities** | | **Generic competences** and **Cross-cutting issues** to be addressed + **a short explanation** |
|---|---|---|---|
| | With student's books, learners will conduct research on enzymes characteristics and present their findings on the blackboard | | |
| | **Teacher's activities** | **Learner's activities** | |
| **1. Introduction (10min)** | Asking some questions<br>- What is an enzyme?<br>- What is a catalyst?<br>- What are the types of enzymes? | Answer teacher's questions<br>……..<br>……..<br>……. | - Critical thinking through remembering the previous lessons<br>- Communication through talk |
| **2. Development of the lesson (50 min)** **2.1 discovery activities (20min)** | - Ask students to form groups of 6 pupils<br>- Provide materials (student's book)<br>- Ask learners to open the book to page 86 and 87 and ask learners to search for characteristics of enzymes<br>- Monitor the students and help them | Form groups of 6 pupils and share responsibility<br>- Learners listen to instructions-Students conduct research on characteristics of enzymes through student's books | - Inclusive Education through the involvement of girls and boys<br>- Communication developed through discussion<br>- Cooperation developed through interaction<br>- Research and problem solving developed through search engine activity |

Appendix 2: Example of a lesson plan (S2 biology)

| | | | | |
|---|---|---|---|---|
| | | - Ask learners to record their findings (note down) and steps undergone | - Learners record their findings (note down) and steps have undergone | |
| | **2.2 presentation learners' findings production (10 min)** | - Invite representatives of the group to present their findings (one among the group members will be randomly chosen to present)<br><br>Concreate output the teacher expects or learner should find<br><br>- Request the rest of the class to write down whatever other groups are presenting<br><br>- Give time to learners to ask for clarifications | - Representatives of groups present their findings<br><br>* Enzymes are protein in nature<br>* Enzyme s are affected by temperature<br>* Enzymes work best at specific pH<br>* Enzymes remain unchanged after catalyzing a reaction<br>* Enzymes catalyze reversibly<br>Reactions<br>* Enzymes are substrate-specific<br>* Enzymes work rapidly<br>* Enzymes are efficient<br><br>Other students follow the presentations<br>- Learners write down questions and comments for clarification<br><br>- Learners ask and comments on each group presentation | - Communication developed through presentation<br>- Interpersonal relations and life skills<br>- Lifelong learning promotes the development of higher-order thinking skills (the way group members assist representative) |
| | **2.3 exploitation findings production (10 min)** | - Ask students to evaluate presentation which one among the characteristics given are correct<br><br>The teacher helps learners to judge the student findings. Put apart correct and wrong answers in order to clarify the intention of the lesson<br><br>- Check if all characteristics have been covered (*) | - Give comments on the production<br><br>- Follow to the correction of teacher<br><br>- Learners ask for clarifications and are comfortable with all the presented findings | - Critical thinking developed through judging information<br><br>Allow learners to move from simple to more complex knowledge, skills and concepts |

Appendix 2: Example of a lesson plan (S2 biology)

| | | | |
|---|---|---|---|
| **2.4 conclusion/ summary (10min)** | - Requesting learners to summarize the characteristics of enzymes by clarifying the characteristics given by themselves<br><br>- Give time to take notes (summary) | - Participating actively in summarizing the contents<br><br>- Make short notes<br><br>Learners summarize themselves so that teacher and learners are on the same page | - Creativity and innovation developed by putting information together |
| **3. assessment (20 min)** | Engage students to work individually on questions that follow:<br><br>……<br><br>- State any 6 characteristics of enzymes<br>- Explain the specificity of enzymes<br>- What do you think is the role of enzymes? | Do exercise as indicated<br>Learners should clarify:<br>- What are enzymes made of?<br>- What factors affect enzyme action?<br>- Do enzymes act on all substrates?<br>- Do enzymes change after a reaction?<br><br>Clear assessment questions | - Critical thinking developed through linking learners' findings and the next lesson |
| **Observation on lesson delivery** (to be completed by the teacher) | | | |

# ABISHYIZE HAMWE

Learners discussing in a group at GS Notre Dame des Apôtres Rwaza

Learners raising their hands at EP Buhande

A teacher monitoring learners' work at GS Kabuye Catholique

A teacher listening to learners at GS APAGIE Musha

Teachers discussing a lesson plan at GS APAGIE Musha

# NTA KIBANANIRA

The Lesson Study group discussing teaching methods at GS Notre Dame des Apôtres Rwaza

A teacher facilitating an experiment at GS St Aloys Rwamagana

Learners presenting their findings at GS Mukarange Catholique

A teacher asking giving a question to learners at EP Buhande

A teacher and learners during an outside activity at GS Kabuye Catholique

**SIIQS Project Brief**

| | | |
|---|---|---|
| **Project Title** | : | The Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS) |
| **Period** | : | January 2017 – December 2019 (3 years) |
| **Target Area** | | Nationwide |
| **Beneficiaries** | : | Teachers in primary, 9/12YBE, secondary schools |
| **Implementing Agency** | : | Rwanda Education Board and Japan International Cooperation Agency (JICA) through provision of expertise by PADECO Co., Ltd. |
| **Overall Goal** | : | Students' learning process in classroom is improved. |
| **Project purpose** | : | Implementation of CBC-based lesson in the classroom is strengthened through SBI activities. |
| **Output 1** | : | Teachers' understanding of CBC-based lesson implementation is enhanced. |
| **Output 2** | : | Problem-solving capacities are enhanced at school, sector, district, and national level. |

Rwanda Education Board

**Project for Supporting Institutionalizing and Improving Quality of SBI Activity**

# Appendix 16. Endline Survey Report

RWANDA EDUCATION BOARD
REPUBLIC OF RWANDA

# The Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS)

# Endline Survey Report

October 2019

JAPAN INTERNATIONAL COOPERATION AGENCY

PADECO Co., Ltd.

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# Abbreviations and Acronyms

| | |
|---|---|
| 9/12 YBE | 9 Years Basic Education School and 12 Years Basic Education School |
| AAT | Academic Achievement Test |
| BLS | Baseline Survey |
| CBC | Competence Based Curriculum |
| CPD | Continuous Professional Development |
| CTR | Control Group |
| DCC | District CPD Committee |
| DDE | District Director of Education |
| DEO | District Education Officer |
| DOS | Director of Study |
| ELS | Endline Survey |
| ESSP | Education Sector Strategic Plan |
| FGI | Focus Group Interview |
| GR | Graduation Rate |
| GS | Groupe Scolaire |
| HOT | Higher Order Thinking |
| HT | Head Teacher |
| INTV | Interview |
| JICA | Japan International Cooperation Agency |
| KPI | Key Performance Indicator |
| LCM | Learner-Centered Methodology |
| LS | Lower Secondary |
| PCR | Pupil Classroom Rate |
| PDM | Project Design Matrix |
| PISA | Programme for International Student Assessment |
| PR | Pass Rate |
| PS | Primary School |
| QNR | Questionnaire |
| REB | Rwanda Education Board |
| SBI | School-based In-service teacher training |
| SBM | School-based Mentor |
| SBMP | School-based Mentorship Program |
| SCC | Sector CPD Committee |
| SEO | Sector Education Officer |
| SET | Science and Elementary Technology |
| SIIQS | Supporting Institutionalizing and Improving Quality of SBI Activity |
| SS | Secondary Schools |
| SSL | School Subject Leader |
| SWOT | Strengths, Weaknesses, Opportunities and Threats |
| TIMSS | Trends in International Mathematics and Science Study |
| TRT | Treatment Group |
| US | Upper Secondary |

# 1. Introduction

The joint project between Rwanda Education Board (REB) and Japan International Cooperation Agency (JICA) has been supporting the Teacher Training Unit of Teacher Development & Management and Career Guidance & Counseling Department in REB since January 2017 to 1) improve teacher's knowledge and skills on Competence-based Curriculum (CBC) and 2) strengthen Continuous Professional Development (CPD) mechanisms. As it will end December 2019, the project conducted the "Endline Survey (ELS)" to evaluate the contribution of Project activities. In this document, we report the findings of the ELS which draws on various data such as lesson videos, lesson plans, questionnaire responses from teachers and focus group interviews of key informants, as well as academic achievement tests for students administered in target schools.

## 1.1 Background

The introduction of CBC in 2016 called for a big paradigm shift on teaching to align with national aspirations and to ensure that the knowledge, skills, attitudes and values acquired in schools meet the challenges of the 21st century. CBC requires large-scale efforts to equip teachers with the new way of teaching which fits the new curriculum. As part of the effort, REB provided a three-year CBC induction training program for teachers from 2015/16 to 2017/18.
REB and JICA launched and implemented the three-year Project for Supporting Institutionalizing and Improving Quality of SBI (SIIQS Project) in January 2017. The project has two components:
1) Enhance teacher's knowledge and skills on CBC
2) Establish coherent CPD mechanisms at the school, sector and district levels.

The Project has piloted "Lesson Study" as one of the effective CPD models which inherently engages teachers in a CPD nature. It has been practiced in Japan for about 100 years and is globally known as one of the pillars of Japanese quality education nowadays. Through the Lesson Study process, the Project has developed lesson video samples at six pilot schools. The lessons learned though this practice were also reflected in the CBC training materials, including paper-based and digital training manuals. They have been distributed to all schools across the country through CBC induction training Phase III. In addition, the Project has supported District and Sector CPD Committees (DCCs and SCCs) in the stages of establishment, planning, and monitoring and evaluation in order to strengthen CPD monitoring mechanisms. The Project aimed to harmonize these activities in order to have good learning achievements through quality lessons. The conceptual image of the Project design is shown in Figure 1-1.

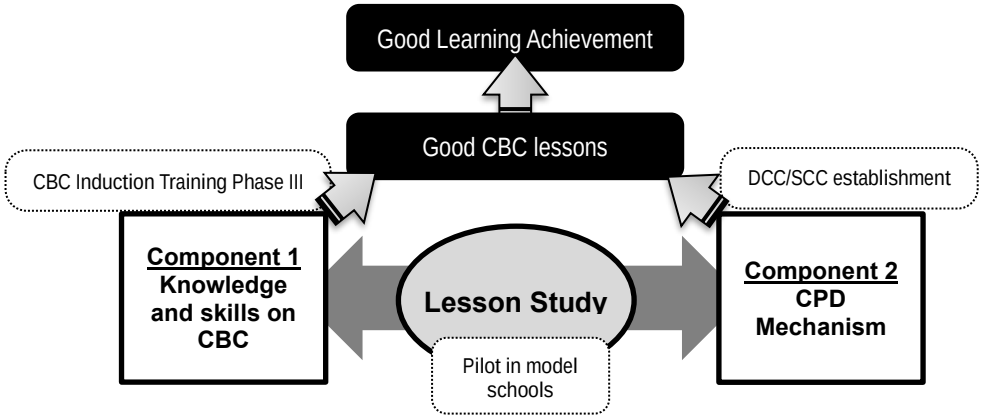



**Figure 1-1 Conceptual Image of the Project**

## 1.2 Objectives of ELS

### 1.2.1 Objectives

Now that the Project will come to end, measuring the extent of success and drawing lessons from findings is needed, in relation to the Baseline Survey (BLS) conducted in 2017. Therefore, the Project conducted ELS in June 2019 for evaluation purposes. The objectives of the ELS are summarized as follows;

- To understand the extent to which teachers understand and put CBC into practice in their teaching,
- To figure out how much CPD has been conducted at schools and its impact on academic performance,
- To identify challenges in operating DCCs and SCCs as part of the problem-solving cycle
- To draw recommendations for expansion of Lesson Study to all schools in Rwanda

### 1.2.2 Key Performance Indicators (KPIs)

The Project outline and its benchmarks (Key Performance Indicators: KPIs) are stipulated in a logical framework called the Project Design Matrix (PDM) as shown in Table 1-1.

**Table 1-1: Indicators of PDM**

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification |
|---|---|---|
| Overall Goal | | |
| Students' learning process in classroom is improved. | 1) More students in a model school than those in a control school present relevant responses to an open question posed by a teacher. | 1) Lesson observation in sampled schools |
| | 2) Result of the academic achievement test developed by the Project improves more in model schools compared to control schools. | 2) Results of the academic achievement test in sampled schools |
| Project Purpose | | |
| Implementation of CBC-based lesson in the classroom is strengthened through SBI[1] activities. | 1) Lesson plans developed by teachers in model schools include all elements specified in Competence 2.1 of the National Teacher CPD Framework. | 1) Lesson plans developed by Lesson Study in model schools |
| | 2) Teachers give more open questions in model schools compared to control schools. | 2) Lesson observation in sampled schools |
| Outputs | | |
| 1. Teachers' understanding of CBC-based lesson implementation is enhanced. | 1) Post-test results of participants in trainings and workshops including an e-learning course exceed 70%. | 1-1) Post questionnaire survey to participants in technical stream of CBC training<br>1-2) Online CPD course assessments |
| | 2) Self-evaluation of teachers' understanding of CBC-based lessons continues to be 90% or above. | 2-1) Questionnaire survey in sampled schools<br>2-2) Questionnaire survey to participants in technical stream of CBC training |
| 2. Problem-solving capacities are enhanced at school, sector, district, and national levels. | 1) All sectors implement sector-based CBC training. | 1) Monitoring conducted by REB |
| | 2) More than one good practice of school-based CPD is reported quarterly from all DCCs that have been established.<br>3) The rate of teachers' participation in school-based CPD increases from 75% (baseline) to 90%. | 2-1) Monthly Monitoring Report submitted by DCCs and SCCs<br>2-2) Quarterly Monitoring Report<br>3-1) Questionnaire in sampled schools<br>3-2) Monthly Monitoring Report submitted by DCCs |
| | 4) More than 50% of DCCs and SCCs submit monitoring reports using a developed form on a monthly basis. | 4) Monthly Monitoring Report submitted by DCCs and SCCs |

[1] SBI stands for "School-Based In-service training". This term was initially common when the Project was formulated. However, this has evolved into the broader concept named CPD and is no longer used nowadays.

The PDM was reviewed by REB and JICA to set out relevant indicators based on the latest situation and their expectation before the commencement of ELS, so that the Project team was able to objectively evaluate the achievement. Data needed to evaluate some indicators come from regular project activities, however, ELS aimed to conduct a field survey to gather additional data (indicated by underlined items in the below table).

## 1.3 Field Survey Design

### 1.3.1 Target Groups and Data Collection Methods

As Figure 1-1 highlights, the Project has been continuously providing the treatments (Lesson Study) at six model schools. Meanwhile, the Project has treated DCC and SCC so that they share CPD good practices with other schools in their area, too. The Project devised an experimental design of the treatment for the model schools and DCCs/SCCs which drew on standardized Academic Achievement Tests (AATs), lesson videos, lesson plans as well as questionnaire responses from the treatment and the control group. In addition, the Project planned a series of interviews with key informants to gather narrative evidences to consolidate findings. Thus, the field survey was designed for covering such various target groups to collect a wide range of data as shown in Table 1-2.

**Table 1-2: Outline of ELS activities**

| Target Groups | | Survey Items | Survey Instruments |
|---|---|---|---|
| Component 1: Knowledge and skills of teachers on CBC implementation | | | |
| School | Students | - Learning achievements<br>- Behavior in lessons | - Test (AAT)<br>- Lesson video recording |
| | Teachers | - Lesson preparation<br>- Behavior in lessons<br>- Awareness of CBC | - Lesson plan<br>- Lesson video recording<br>- Questionnaire |
| | Head Teachers | - Readiness of teachers for CBC | - Questionnaire<br>- Interview |
| Component 2: CPD Mechanism | | | |
| School | Teachers | - Awareness of CPD<br>- Engagement in CPD | - Questionnaire<br>- Focus Group Interview (FGI) |
| | Head Teachers | - Awareness of CPD<br>- engagement in CPD | - Questionnaire<br>- Interview |
| DCC<br>SCC | District Directors of Education (DDEs)<br>District Education Officers (DEOs) | - Awareness of CPD<br>- Good Examples | - Interview |
| | Sector Education Officers (SEOs) | - Awareness of CPD<br>- Good Examples | - Interview |

### 1.3.2 Selection of Target Schools, Sectors and Districts

To objectively verify the effects of experimental design, the Project selected schools which have similar attributes to the model schools from the list of schools we have visited in the BLS, and set them as a control group to compare with the treatment group. The composition of the treatment and the control group is shown in Table 1-3. Shortened school names in brackets are abbreviations used hereafter throughout this report.

**Table 1-3: Composition of Treatment and Control Groups**

| Group | School | Type | Treated from | # of Lesson Study since 2017 | DCC | SCC |
|---|---|---|---|---|---|---|
| TRT | EP Buhande | PS | 2017 | 4 | Rulindo | Bushoki |
| | GS Kabuye Catholique (GS Kabuye) | 9YBE | 2013 | 2 | Gasabo | Jabana |
| | GS Mukarange Catholique (GS Mukarange) | 12YBE | 2018 | 3 | Kayonza | Mukarange |
| | GS APAGIE Musha (GS APAGIE) | SS | 2017 | 4 | Rwamagana | Musha |
| | GS St Aloys Rwamagana (GS St Aloys R) | SS | 2013 | 2 | Rwamagana | Kigabiro |
| | GS Notre Dame des Apôtres Rwaza (GS NDA Rwaza) | SS (girls) | 2018 | 3 | Musanze | Remera |
| CTR | EP Bukinanyana ADEPR (EP Bukinanyana) | PS | | | Nyabihu | Jenda |
| | GS Gihogwe Catholique (GS Gihogwe) | 12YBE | | | Gasabo | Gatsata |
| | GS Bubazi | 9YBE | | | Karongi | Rubengera |
| | Lycée Notre Dame de la Visitation (LNDV) | SS (girls) | 2017 only* | 1 | Rulindo | Bushoki |
| | GS Rambura Garçons (GS Rambura G) | SS | | | Nyabihu | Rambura |

Legend: "TRT": Treatment group, "CTR": Control group, "PS": Primary School, "SS": Secondary School, "9YBE": 9 Year Basic Education School, "12YBE": 12 Year Basic Education School, "(girls)": Girls' school
*LNDV was once treated in 2017 and terminated after the first trial.

**Table 1-4: Attributes of Schools in Treatment and Control Group (2018)**

| | TRT | | | | | CTR | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Level** | **School Name** | **Pupil total** | **PCR** | **PR (%)** | **GR (%)** | **School Name** | **Pupil total** | **PCR** | **PR (%)** | **GR (%)** |
| PS | EP Buhande | 531 | 37.9 | 57.9 | 54.7 | GS Bubazi | 603 | 76.5 | 76.9 | 72.2 |
| | GS Mukarange | 1,278 | 53.3 | 96.9 | 56.3 | EP Bukinanyana | 918** | 60.3 | 71.7 | 70.8 |
| | GS Kabuye | 2,194 | 109.7 | 99.1 | 72.2 | GS Gihogwe | 1,614 | 70.2 | 99.0 | 97.1 |
| | **Average** | **1334.3** | **67.0** | **84.6** | **61.0** | **Average** | **1045.0** | **69.0** | **82.5** | **80.0** |
| LS (O' level) | GS Kabuye | 373 | 53.3 | 94.2 | 111.4 | GS Bubazi | 390 | 26.0 | 89.1 | 85.4 |
| | GS Mukarange | 889 | 80.8 | 76.9 | 64.9 | GS Gihogwe | 658 | 65.8 | 90.9 | 80.9 |
| | GS APAGIE | 285 | 35.6 | 100.0 | 100.0 | GS Rambura G | 321 | 35.7 | 100.0 | 100.0 |
| | GS St Aloys R | 431 | 47.9 | 100.0 | 93.2 | | | | | |
| | GS NDA Rwaza* | 246 | 41.0 | 100.0 | 100.0 | LNDV* | 216 | 43.2 | 100.0 | 100.0 |
| | **Average** | **444.8** | **51.7** | **94.2** | **93.9** | **Average** | **396.3** | **42.7** | **95.0** | **91.6** |
| US (A' level) | GS Mukarange | 491 | 44.6 | 82.1 | 78.71 | GS Gihogwe | 204 | 29.1 | 92.1 | 89.2 |
| | GS APAGIE | 280 | 31.1 | 99.0 | 99.0 | GS Rambura G | 469 | 33.5 | 97.8 | 97.8 |
| | GS St Aloys R | 652 | 43.5 | 100.0 | 100.4 | | | | | |
| | GS NDA Rwaza* | 360 | 30.0 | 99.0 | 96.2 | LNDV* | 175 | 21.9 | 100.0 | 100.0 |
| | **Average** | **445.8** | **37.3** | **95.0** | **93.6** | **Average** | **282.7** | **28.2** | **96.6** | **95.7** |

Legend: "Pupil total": Total number of students in each school, "PCR": Ratio of students against the number of classrooms, "PR (%)": Rate of students who passed the national exam (leaving exam) against the number of examinees."GR (%)": Rate of students who passed the national exam against total number of students in the last grade.
*Girls school, **Data in 2019.

Table 1-4 shows the attributes of schools. The treatment and the control groups in the same line correspond to each other. We reviewed school size and performance at each school to verify if the treatment and the control groups have similar traits to compare. We computed Pupil

Classroom Rate (PCR), Pass Rate (PR) of national exam and Graduation Rate[2] (GR) from available data in 2018 as a proxy performance indicator. The table indicates that they had similar traits (or the treatment group is even worse) overall for ELS to objectively evaluate according to the experimental design.

## 1.4 Survey Instruments and Method

### 1.4.1 Administration of Academic Achievement Test (AAT)

Multiple-choice type mathematics and science tests developed by the Project experts during the BLS in 2017 were used (Appendix A-1 to A-6) as AATs for this survey. The 40-minute tests were designed for P4, S1 and S4 students and used in the model schools to assess the initial level of student achievement at the start of Lesson Study. Those students in the initial survey in 2017 theoretically advanced to P6, S3 and S6 respectively. Therefore, they should have benefitted from being in the treatment group during the project, and presumably should attain better AAT results than those in the control group. Hence learners in these grades were targeted for AAT comparison.

### 1.4.2 Video Recording and Lesson Plan Collection

Surveyors used a video camera and a tripod to record entire lessons and collected lesson plans for the recorded lessons. The Project conducted Lesson Study for the below subjects in the 2nd term 2019, just before ELS started. Thus, lesson video recording basically targeted these subjects to examine the treatment effects compared to lessons in the control group. If target schools could not arrange these lessons during the survey, the surveyors recorded lessons of a similar subject (e.g. physics as an alternative of chemistry) or the same subject in a different grade.

- Mathematics (P5/S2/S5)
- Science and Elementary Technology (SET) (P5)
- Biology (S2)
- Chemistry (S5)

### 1.4.3 Questionnaire for Teachers

The questionnaire for school teachers (Appendix B) was intended to evaluate teachers' understanding of CBC and implementation of CPD. It had some questions in common with the questionnaire in BLS. It included the following items:

- Basic information (name, experience, teaching subject, etc.)
- Self-evaluation about CBC teaching practice
- Understanding of CBC
- Participation in CPD
- Perception on school management

Teachers who teach either mathematics or science subjects were the target. Collected questionnaires were analyzed quantitatively and qualitatively.

### 1.4.4 Questionnaire for Head Teachers

To collect general information about schools and status of CBC and CPD, a questionnaire for head teachers (Appendix C) was designed based on the questionnaire in BLS. It covered the following items:

- Basic information (name, school type and facilities, etc.)
- Status of CBC and CPD
- Evaluation of CBC and CPD at the school

[2] We simply calculated GR as the total number of students who passed the national exam divided by the population in the last grade as of 1st term. It can exceed 100% if a school received transfers from other schools.

The Director of Study (DOS) was allowed to answer the questionnaire on behalf of the HT, when he or she was more familiar with CBC and CPD in the school. Collected questionnaires were analyzed quantitatively and qualitatively.

### 1.4.5 Interview with Teachers

The Focus Group Interview (FGI) with teachers was organized to collect detailed information about the items in the questionnaire. Those who answered the questionnaire and had time for an interview were requested to participate. The interview sheet (Appendix D) had the following items:

- Changes in teaching practice since the introduction of CBC
- Challenges in CBC
- Participation in CPD and types of activities
- Challenges in CPD at school

Surveyors recorded the interview with a video camera as long as the HT agreed, and took notes on the interview sheet at the same time. Collected information was used as evidence for analysis.

### 1.4.6 Interview with Head Teachers

An interview sheet for HTs (Appendix E) was designed to broaden information gathered from the questionnaire for HTs. It contained the following questions (but as a semi-structured interview, the surveyors had flexibility to modify questions during individual interviews according to the answers from HTs):

- Changes in teachers' practice since the introduction of CBC
- Challenges in CBC
- Participation in CPD and types of activities
- Evaluation of CPD at school and HT's responsibility in promotion of CPD

The interview was conducted in the same manner as that for teachers. Collected information was used as evidence for analysis. The questions were developed to understand the following:

- Comprehension of CBC concept by teachers, HTs and education officers
- Impact of the CBC induction program
- Needs and gaps in implementation

### 1.4.7 Interview with DDE, DEO and SEO

Interview sheets for SCCs (Appendix F) were designed based on those for DCC/SCC quarterly monitoring to understand the status of CPD and SCC activities in respective sectors. For DCCs, only interview questions were prepared. Interview sheets for SCCs included the following items:

- Planning, implementation, monitoring and evaluation of CPD activities
- Perception about Lesson Study
- Good practices
- Challenges in DCC/SCC operation

Customized questions were included in the interview sheets for some SCCs according to their answers in DCC/SCC needs assessment questionnaire conducted in July 2019. Interviewees were DDEs as representatives of DCCs, and SEOs as representatives of SCCs. The interviews were conducted in the same manner as that for teachers. Collected information was analyzed qualitatively. SWOT analysis was applied to examine any potential of Lesson Study expansion.

## 1.5 Data Collection

The targets of the field survey were separated into two affiliations: schools and DCCs/SCCs. Hence the field survey was divided into two phases.

### 1.5.1 School Visit

The survey was organized from 10th June to 9th July 2019 as shown in Table 1-5. The survey team visited the target schools for data collection. Since lesson video recording for model schools were planned for research lessons developed through the Lesson Study, these lessons were observed on separate days from the days for AAT, questionnaire and interviews at the schools.

**Table 1-5: Survey Schedule for School Visits**

| Date | Day | District | School | Video | AAT | QNR/FGI (teachers) | QNR/INTV (HT) |
|---|---|---|---|---|---|---|---|
| 10 June | Mon | Kayonza | GS Mukarange | ✓(PS) | | | |
| 11 June | Tue | | | | | | |
| 12 June | Wed | Kayonza | GS Mukarange | ✓(LS) | | | |
| 13 June | Thu | Rulindo | EP Buhande | ✓(PS) | | | |
| 14 June | Fri | Musanze | GS NDA Rwaza | ✓ (US math) | ✓ | | |
| 15 June | Sat | | | | | | |
| 16 June | Sun | | | | | | |
| 17 June | Mon | Rwamagana | GS APAGIE | ✓(LS) | | | |
| 18 June | Tue | Gasabo | GS Kabuye | ✓(PS/LS) | ✓ | ✓ | ✓ |
| 19 June | Wed | Gasabo | GS Gihogwe | ✓(PS/LS/US) | ✓ | ✓ | ✓ |
| 20 June | Thu | Rwamagana | GS St Aloys R | ✓(LS/US) | ✓ | ✓ | ✓ |
| 21 June | Fri | Rulindo | LNDV | ✓(LS/US) | ✓ | ✓ | ✓ |
| | | | EP Buhande | | ✓ | ✓ | |
| 22 June | Sat | Rwamagana | GS APAGIE | ✓ (US) | | | |
| 23 June | Sun | | | | | | |
| 24 June | Mon | Kayonza | GS Mukarange | ✓(US) | ✓ | | ✓ |
| 25 June | Tue | Musanze | GS NDA Rwaza | ✓(LS) | ✓ | ✓ | ✓ |
| 26 June | Wed | Rwamagana | GS APAGIE | | ✓ | ✓ | |
| | | Nyabihu | GS Bukinanyana | ✓(PS) | ✓ | ✓ | ✓ |
| 27 June | Thu | Nyabihu | GS Rambura G | ✓(LS/US) | ✓ | ✓ | ✓ |
| 28 June | Fri | Karongi | GS Bubazi | ✓(PS/LS) | ✓ | ✓ | ✓ |
| 29 June | Sat | | | | | | |
| 30 June | Sun | Musanze | GS NDA Rwaza | ✓ (US science) | ✓ | | |
| 1 July | Mon | | | | | | |
| 2 July | Tue | | | | | | |
| 3 July | Wed | Rwamagana | GS APAGIE | | | | ✓ |
| 4 July | Thu | | | | | | |
| 5 July | Fri | | | | | | |
| 6 July | Sat | | | | | | |
| 7 July | Sun | | | | | | |
| 8 July | Mon | | | | | | |
| 9 July | Tue | Rulindo | EP Buhande | | | | ✓ |

Legend: "Video": Lesson video recording, "AAT": Academic Achievement Test, "QNR": Questionnaire, "FGI": Focus Group Interview, "INTV": Interview

NB: Description in the brackets in Video indicates the target levels of lesson observation.

### 1.5.2 District/Sector Education Office Visit

The visits to DCCs/SCCs were organized as part of the 2nd quarter DCC/SCC monitoring in August to September 2019 as shown in Table 1-6.

**Table 1-6: Survey Schedule for DCC/SCC Visit**

| Date | Day | District | Sector |
|---|---|---|---|
| 27 August | Tue | Nyabihu | Jenda |
| | | | Rambura |
| | | Rwamagana | Musha |
| | | | Kigabiro |
| 28 August | Wed | | |
| 29 August | Thu | Musanze | Remera |
| 30 August | Fri | Rulindo | Bushoki |
| 31 August | Sat | | |
| 1 September | Sun | | |
| 2 September | Mon | | |
| 3 September | Tue | Kayonza | Mukarange |
| 4 September | Wed | Gasabo | Gatsata |
| 5 September | Thu | | |
| 6 September | Fri | Karongi | Rubengera |

## 1.6 Sample Size

### 1.6.1 Lesson videos, Lesson Plans and AATs

Surveyors visited 11 schools and collected 41 lesson videos, 37 lesson plans and a total of 2,346 AATs. When the lessons of the target grade/subject did not take place on the day of survey, a similar grade/subject was observed instead. The sample size is shown in Table 1-7.

**Table 1-7: Sample Size of Lesson videos, Lesson Plans and AATs**

| Group | School | Type | Survey item | PS | | LS (O' Level) | | US (A' Level) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Math | SET | Math | Science | Math | Science | |
| TRT | EP Buhande | PS | Video/LP | P5 | P5 | | | | | |
| | | | AAT | 36 | 40 | | | | | |
| | GS Kabuye | 9YBE | Video/LP | P5 | P5 | n/a* | S2 (bio) | | | |
| | | | AAT | 128 | 137 | 41 | 25 | | | |
| | GS Mukarange | 12YBE | Video/LP | P5 | P5 | S2 | S2 (bio) | S5 | S2 (phy) | |
| | | | AAT | 39 | 42 | 45 | 45 | 57 | 14 | |
| | GS St Aloys R | SS | Video/LP | | | S2 | S3 (bio) | S4 | S4 (che) | |
| | | | AAT | | | 56 | 69 | 100 | 64 | |
| | GS APAGIE Musha | SS | Video/LP | | | S2 | S2 (bio) | S5 | S4 (che) | |
| | | | AAT | | | 47 | 48 | 54 | 37 | |
| | GS NDA Rwaza | SS (girls) | Video/LP | | | S2 | S2 (bio) | S4 | S4 (che) | |
| | | | AAT | | | 35 | 38 | 39 | 77 | |
| CTR | EP Bukinanyana | PS | Video/LP | P5 | P5 | | | | | |
| | | | AAT | 61 | 69 | | | | | |
| | GS Bubazi | 9YBE | Video/LP | P5 | P5 | S2 | S2 (che) | | | |
| | | | AAT | 48 | 44 | 45 | 48 | | | |
| | GS Gihogwe | 12YBE | Video/LP | P5 | P5 | S2 | S2 (bio) | n/a** | n/a** | |
| | | | AAT | 137 | 140 | 78 | 73 | n/a** | n/a** | |
| | GS Rambura G*** | SS | Video/LP | | | S2 | S2 (bio) | S5 | S4 (che) | |
| | | | AAT | | | 43 | 44 | 87 | 34 | |
| | LNDV**** | SS (girls) | Video/LP | | | S2 | S2 (bio) | S5 | S4 (phy) | |
| | | | AAT | | | 22 | 21 | 19 | 20 | |
| Total | # of Lesson Recorded | | | 6 | 6 | 8 | 9 | 6 | 6 | 41 |
| | # of Lesson Plans Collected | | | 6 | 6 | 6 | 9 | 5 | 5 | 37 |
| | # of Participants in AAT | | | 449 | 472 | 412 | 411 | 356 | 246 | 2346 |

* LS mathematics lesson at GS Kabuye could not be observed because of the timetable.
** GS Gihogwe is a 12YBE, but it does not have mathematics and science subjects in upper secondary level. Therefore, no lessons were observed and no AATs were administered in upper secondary.
*** The lesson plans in S2 math, S5 math and S4 chemistry at GS Rambura were not collected.
**** The lesson plan in S2 math at LNDV had not been prepared.

### 1.6.2 Questionnaires and Interviews at Target Schools

Table 1-8 shows the sample size of questionnaires and interviews. The questionnaire and interview for HTs were conducted at all schools. The sample size of the questionnaire for teachers was 101, and the group interview was 94. Most teachers attended both questionnaire and interview surveys.

**Table 1-8: Sample Size of Questionnaire and Interview at Schools**

| School | QNR (teachers) | FGI (teachers) | QNR & INTV (HT) |
|---|---|---|---|
| EP Buhande | 9 | 9 | 1 |
| GS Kabuye | 12 | 13 | 1 |
| GS Mukarange | 14 | 11 | 1 |
| GS APAGIE* | 8 | 9 | 1 |
| GS St Aloys R | 8 | 8 | 1 |
| GS NDA Rwaza | 4 | 3 | 1 |
| EP Bukinanyana* | 5 | 6 | 1 |
| GS Gihogwe | 16 | 12 | 1 |
| GS Bubazi | 6 | 5 | 1 |
| LNDV | 5 | 4 | 1 |
| GS Rambura G | 14 | 14 | 1 |
| Total | 101 | 94 | 11 |

* In GS APAGIE and EP Bukinanyana, interviews were conducted before questionnaire due to teachers' timetables. Therefore, sample size of the interview was larger than that of questionnaire.

### 1.6.3 Questionnaires and Interviews at DCCs and SCCs

Interviews with DCCs and SCCs were conducted at districts and sectors where ELS target schools are located. Table 1-9 shows the sample size. Interviews with DDEs Gasabo, Musanze and Rulindo, and an interview with SEO Jabana were not conducted due to last minute time conflicts.

**Table 1-9: Sample Size of Interview with DCCs and SCCs**

| DCC | INTV (DDE) | SCC | INTV (SEO) |
|---|---|---|---|
| Rwamagana | 1 | Musha | 1 |
| | | Kigabiro | 1 |
| Gasabo | 0 | Jabana | 0 |
| | | Gatsata | 1 |
| Nyabihu | 1 | Jenda | 1 |
| | | Rambura | 1 |
| Musanze | 0 | Remera | 1 |
| Rulindo | 0 | Bushoki | 1 |
| Kayonza | 1 | Mukarange | 1 |
| Karongi | 1 | Rubengera | 1 |
| Total | 4 | Total | 9 |

## 1.7 Limitation

The ELS was designed to evaluate the changes and influences which could have stemmed from Project at model schools, by comparing relevant data between the treatment group and the control group. Since schools in the control group were selected among target schools in the BLS, focusing solely on the similarity of attributes does not reflect geographical disparities when comparing. Furthermore, both the treatment and the control groups have received support from other DPs more or less in conducting CPD and improving teachers' competencies. The analysis did not eliminate changes and influences brought by such synergy effect.

# Part I

## Learning and Teaching at schools

# 2. CBC Practice in Lessons

The Project found the following changes in teaching practice.

- Lesson plans in the treatment group tended to be more detailed, embodying important elements provided in the National Teacher CPD Framework.
- Teachers in the treatment group used open questions more frequently than teachers in the control group. Their lessons have become more learner-centered in that they interacted with learners in a way that supports learning.
- Teachers in the treatment group demonstrated better understanding of the concepts of CBC.

In sum, lessons in the treatment group are transitioning to CBC more smoothly. This difference can be attributed to Lesson Study.

## 2.1 Lesson Planning

Lesson plan is a fundamental tool to "architect" a creative lesson. Lesson Study encourages teachers to spend adequate time (1-2 weeks) for developing and revising the research (demo) lesson plan. Currently, all lesson plans for observed lessons including the control group (except for four lessons) were available. Lesson plans developed in Lesson Study are attached as Appendix G-1 to G-12. The project attempted to review how the lesson plans have been changed since BLS and to evaluate the quality.

### 2.1.1 Evaluation of Lesson Plans

The National Teacher CPD Framework provides elements that should be included in a lesson plan in the description of *Competence 2.1 Plan learning outcomes and objectives*. We particularly focused on five among these elements during Lesson Study at model schools which were identified weak points at the onset of the Project (One element (No.1) is divided into two sub-elements for evaluation). And then, based on the description, we elaborated evaluation criteria for our comparative study and prepared the rubrics on a four-level scale: 0 (No description), 1 (Poor), 2 (Fair), 3 (Good) as shown in Table 2-1.

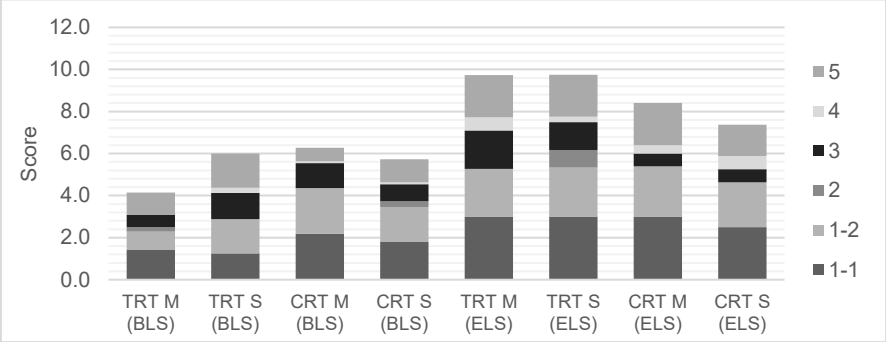
**Table 2-1: Rubric for Lesson Plan Evaluation**

| Criteria | | No description | Poor | Fair | Good |
|---|---|---|---|---|---|
| 1. Clear and measurable outcomes and objectives and activities to achieve them. | 1-1. Clear and measurable outcomes and objectives | 0 | 1 | 2 | 3 |
| | 1-2. Attainableness of Activities | 0 | 1 | 2 | 3 |
| 2. Learning outcomes and objectives support learners to move from simple and familiar to more complex and sophisticated knowledge and skills | | 0 | 1 | 2 | 3 |
| 3. Regular revision of learning and learning assessments. | | 0 | 1 | 2 | 3 |
| 4. Adaptions for specific learners. | | 0 | 1 | 2 | 3 |
| 5. Use a range of TLRs, vary interaction patterns | | 0 | 1 | 2 | 3 |

The average evaluation scores and supplementary stacked bar chart are shown in Table 2-2 and Figure 2-1 respectively; by survey type (BLS, ELS), school type (treatment, control) and subjects. Overall, the average scores of the treatment and the control groups in ELS were higher than those of BLS for each element. In addition, the average scores of the treatment group were higher than those of the control group in ELS, despite they tended to be lower in BLS. The facts implicate that teachers in Rwanda enhanced their lesson planning capacity in general, presumably because of CBC induction trainings, CPD and daily experience. However, Lesson Study did accelerate the lesson planning capacity in the treatment group more than in the control group.

**Table 2-2: Evaluation Score Lesson Plan (Average)**

| Survey | Type | Subject | *N* | 1-1 | 1-2 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| BLS | TRT | Math | 14 | 1.4 | 0.9 | 0.2 | 0.6 | 0.0 | 1.1 |
| | | Science | 8 | 1.3 | 1.6 | 0.0 | 1.3 | 0.3 | 1.6 |
| | CTR | Math | 11 | 2.2 | 2.2 | 0.0 | 1.2 | 0.1 | 0.6 |
| | | Science | 11 | 1.8 | 1.6 | 0.3 | 0.8 | 0.1 | 1.1 |
| ELS | TRT | Math | 11 | 3.0 | 2.3 | 0.0 | 1.8 | 0.6 | 2.0 |
| | | Science | 12 | 3.0 | 2.3 | 0.8 | 1.3 | 0.3 | 2.0 |
| | CTR | Math | 5 | 3.0 | 2.4 | 0.0 | 0.6 | 0.4 | 2.0 |
| | | Science | 8 | 2.5 | 2.1 | 0.0 | 0.6 | 0.6 | 1.5 |

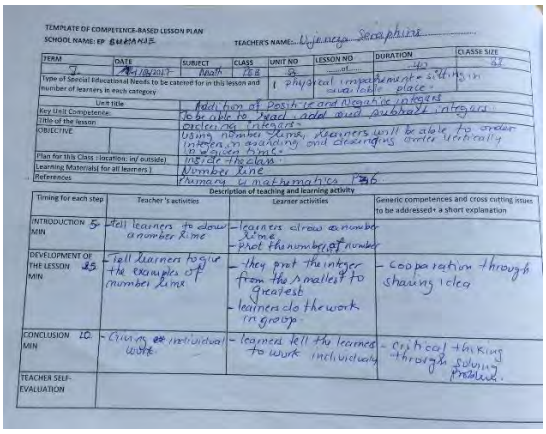



Legend: "M": Mathematics, "S": Science

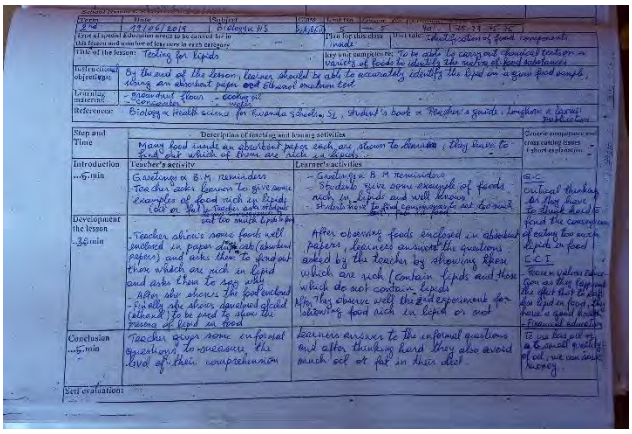
**Figure 2-1: Evaluation Scores of Lesson Plan (Cumulation of Average Score of each Criterion)**

### 2.1.2 Appearance of the Lesson Plans

The above trends were observed visually, too. During the BLS, we commonly found abstract lesson plans which simply outlined a lesson (i.e. "do group work", "ask questions" etc.) as shown in Figure 2-2, example 1. To the contrary, now we can easily find more detailed lesson plans in many schools which describe details of activities, cross cutting issues, etc., as shown in Figure 2-2, example 2. Figure 2-2, example 3 shows the image of the lesson plan developed through Lesson Study in the treatment group[3]. As it can be seen at a glance, the lesson plan is more structured to specify the steps of the learning activity. It contains "expected (correct) answers of learners" so that both a teacher and observers can properly assess learning achievement timely during the lesson. Teaching aids are graphically illustrated in the plan.

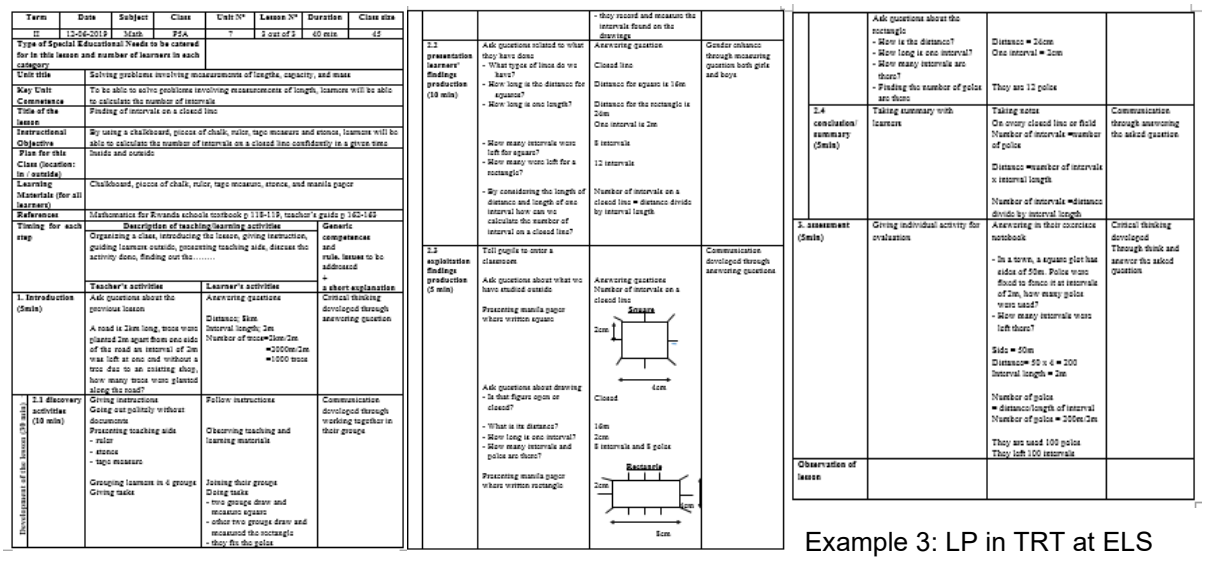



Example 1: LP in TRT at BLS



Example 2: LP in CTR at ELS

[3] The Project piloted a new lesson plan format proposed by Curriculum, Teaching & Learning Resources Department in REB.



Example 3: LP in TRT at ELS

**Figure 2-2: Examples of Lesson Plans**

The Project found the following similarities and differences between the two groups. Firstly, all lessons had the following flow as a structure: 1) Review of the previous lesson, 2) main learning activity of the lesson (e.g. group work), 3) presentation of findings/answers, 4) conclusion/summary, 5) assessment. This structure is embedded in the lesson plan template, hence it is natural that the structure of lessons was similar to each other to some extent.

Among important points in lesson planning, objectives were clearly written in the "Instructional Objectives" section on the whole. In the "Description of teaching and learning activity" section, activities of both the teacher and learners were arranged in sequence, which is easy for observers to follow. These activities, as well as those in the "Assessment" section were also consistent with the objectives of the lesson. Lesson plans of the treatment group were well written in terms of the quality of description of activities. The activities of learners were not written as mere turn-over of the action of the teacher in these lesson plans (e.g. the teacher "asks learners a question". The learners "answer the question"). Instead, the way the teacher interacts with learners, and how he/she facilitates learning were specified. What learners do or expected answers from learners were described in detail.

## 2.2 Analysis of Lesson Delivery

Lesson Study provided teachers of the treatment group with the opportunity to improve teaching and learning by taking up a real lesson and planning it together during CPD. In order to evaluate the impact of Lesson Study on lessons, we observed and video-recorded lessons at the treatment and control schools. Observed lessons were: P5 Mathematics, P5 SET, S2 Biology, S2 Mathematics, S4 Chemistry, S5 mathematics. These grades and subjects were the target of the Lesson Study for the treatment group in the second term of 2019. The same grades and subjects were video recorded as much as possible to make a fair comparison with the control group in similar conditions.

### 2.2.1 Coding

Discourse analysis was conducted, building on an analytical framework developed by Ikeya (2009). Transcribed teachers' and learners' talks, as well as some actions such as gestures and writing were classified into codes shown in Table 2-3 and Table 2-4.

**Table 2-3: Teacher Code List**

| Code | Acronym | Examples of talks |
|---|---|---|
| Explanation | Xpl | We are going to… |
| Closed Question | CQ | What is the topic? One times three is equal to? Who can tell us the content of this lesson? (one correct answer) |
| Open Question | OQ | Why? (invite diverse answers/thinking of learners) |
| Rephrase teacher | Rph-T | How can we sustain the environment?/What can we do to stop deforestation? (replace teacher's question or statement with simple/easy words the learners understand) |
| Rephrase student | Rph-S | Student: rain takes away soil.<br>Teacher: rain causes soil erosion. (Teacher gives technical terms or generalize students' statement). |
| Call attention | Agr | Are we together? |
| Point student | Po | - |
| Confirmation | Cmf | Is it true? / Do you understand? |
| Instruction | Inst | You form the groups./ Write./ Do the exercise. |
| Encouragement | Enc | Clap for him./Very good./ Wonderful |
| Justification | Jst | Okay./ Not./ Here is the correct./ |
| Clap | Cl | - |
| Impossible to listen | Imp | - |
| Others | Oth | Greeting, etc. |

**Table 2-4: Learner Code List**

| Code | Acronym | Examples of talks |
|---|---|---|
| Yes / No answer to teacher | Yn-T | Yes/No |
| Yes / No answer to another student | Yn-S | |
| One term answer to teacher | Num-T | One/ Integers/ -1 times -1/ ten point five. |
| One term answer to another student | Num-S | |
| Question to teacher | Qst-T | What is the meaning of R (Real number)? |
| Question to another student | Qst-S | |
| Opinion to teacher | Op-T | It divided by solidly. |
| Opinion to another student | Op-S | |
| Incomplete answer | Inc | Subt… |
| Repeating or just reading | Rd | Just repeat or read sentences or numbers |
| Silent to teacher | Na-T | You form the groups./ Write./ Do the exercise. |
| Silent to another student | Na-S | Clap for him./Very good./ Wonderful |
| Point student | Po | - |
| Presentation | Pr | (explanation on findings, solution, etc.) |
| Clap | Cl | - |
| Writing or gesture to teacher | Wri-T | (Write something on black board, Obey to instruction, Point out numbers or places) |
| Writing or gesture to another student | Writ-S | |
| Impossible to listen | Imp | - |
| Others | Oth | - |

Figure 2-3 shows the image of coding for a certain lesson. Lesson videos were first transcribed by surveyors and the surveyors assigned initial codes according to the coding rules explained above. Then the secondary reviewers who have similar coding experience in Japan checked transcripts and codes. Ultimately, if there were still uncertain transcripts as to what codes should be assigned, the Project experts determined the code.

**NOTE**: The analysis in this section does not include the discourses in specific learning tasks such as group work and pair work in general, as these talks are inaudible in most cases. Therefore, the results basically described **only entire classroom communications**.

| Time From | Time To | Duration | Transcript | Teachers Code | Symbol | Students Code | Symbol |
|---|---|---|---|---|---|---|---|
| 00:20:40 | 00:21:32 | 0:00:52 | T: twenty four, those who have a rectangle*2 the one written on rectangle, do you also have rectangle? Did measure wrongly? Ok, those who measured a square, put your hands up, square*2 hands up, square, group three and group four, how long is the distance?*3 square? How long is the distance? What distance did you get? sixteen meters, how long is one interval? | Explanation | Xpl | | |
| 00:21:33 | 00:21:34 | 0:00:01 | St: two meter | | | One term answer to teacher | Num-T |
| 00:21:34 | 00:21:38 | 0:00:04 | T: two meter, how many poles were are fixed? | Closed Question | CQ | | |
| 00:21:38 | 00:21:39 | 0:00:01 | St: eight trees | | | One term answer to teacher | Num-T |
| 00:21:40 | 00:22:07 | 0:00:27 | T: eight poles or eight trees, how many intervals were left there? How many? Hello that one, how many intervals? you have failed, those who have a rectangle, how long is the distance? | Closed Question | CQ | | |
| 00:22:07 | 00:22:09 | 0:00:01 | St: twenty four meters. | | | One term answer to teacher | Num-T |
| 00:22:09 | 00:22:14 | 0:00:05 | T: twenty four meters, how many intervals were left there? Number of intervals. | Confirmation | Cmf | | |
| 00:22:14 | 00:22:16 | 0:00:01 | St: two meters | | | One term answer to teacher | Num-T |
| 00:22:16 | 00:22:20 | 0:00:04 | T: two meters, how many poles were fixed? | Closed Question | CQ | | |
| 00:22:21 | 00:22:22 | 0:00:01 | St: twelve trees | | | One term answer to teacher | Num-T |
| 00:22:22 | 00:22:38 | 0:00:16 | T: twelve trees, how many intervals were left there? How long is one interval? The length of interval? How long is the length of interval? | Closed Question | CQ | | |
| 00:22:38 | 00:22:45 | 0:00:01 | St: two meters | | | One term answer to teacher | Num-T |
| 00:22:45 | 00:22:55 | 0:00:10 | T: two meters, let us go on that group, that group have the distance of twenty four meters, are you all observing? | Closed Question | CQ | | |
| 00:22:55 | 00:22:57 | 0:00:01 | St: yes | | | Yes / No answer to teacher | Yn-T |
| 00:22:57 | 00:23:19 | 0:00:24 | T: the interval length is two meters, number of interval is twelve, by considering that number, twenty four and two how can we find this one?*2 how can we find that twelve? Your hands up. Yes sifa? | Rephrase teacher | Rph-T | | |
| 00:23:18 | 00:23:17 | 0:00:02 | St: plus one | | | Yes / No answer to another st | Yn-S |
| 00:23:17 | 00:23:29 | 0:00:12 | T: what can you take please, solange can you help us? We have twenty four and two | Closed Question | CQ | | |
| 00:23:29 | 00:23:31 | 0:00:02 | St: twenty four meters divide by two meters. | | | One term answer to teacher | Num-T |
| 00:23:31 | 00:23:35 | 0:00:04 | T: divide by two, yes flowers to solange. | Encouragement | Enc | | |
| 00:23:35 | 00:23:37 | 0:00:02 | St: flowers | | | Clay | Cl |
| 00:23:38 | 00:23:51 | 0:00:13 | T: flowers, I want the other who have a square, this is wrong, those are going to enter in our class. | Call Attention | Agr | | |

| Teacher Code | | |
|---|---|---|
| Code | Frequency | % |
| Xpl | 16 | 9.8% |
| CQ | 60 | 36.6% |
| OQ | 2 | 1.2% |
| Rph-T | 14 | 8.5% |
| Rph-S | 4 | 2.4% |
| Agr | 16 | 9.8% |
| Po | 6 | 3.7% |
| Cmf | 12 | 7.3% |
| Inst | 14 | 8.5% |
| Enc | 11 | 6.7% |
| Jst | 0 | 0.0% |
| Cl | 0 | 0.0% |
| Imp | 0 | 0.0% |
| Oth | 9 | 5.5% |
| Total | 164 | 100.0% |

| Leaner Code | | |
|---|---|---|
| Code | Frequency | % |
| Yn-T | 8 | 9.5% |
| Yn-S | 1 | 1.2% |
| Num-T | 48 | 57.1% |
| Num-S | 0 | 0.0% |
| Qst-T | 0 | 0.0% |
| Qst-S | 0 | 0.0% |
| Op-T | 8 | 9.5% |
| Op-S | 0 | 0.0% |
| Inc | 0 | 0.0% |
| Rd | 3 | 3.6% |
| Na-T | 0 | 0.0% |
| Na-S | 0 | 0.0% |
| Po | 0 | 0.0% |
| Pr | 0 | 0.0% |
| Cl | 1 | 1.2% |
| Wri-T | 0 | 0.0% |
| Writ-S | 0 | 0.0% |
| Imp | 1 | 1.2% |
| Oth | 14 | 16.7% |
| Total | 84 | 100.0% |

**Figure 2-3: Sample Coding Image of Discourse**

### 2.2.2 Comparison of Open Questioning and its Responses

One of the objectives for the CBC induction is to develop Higher-Order Thinking (HOT) skills to create a knowledge-based society. Open questioning is considered one of the key techniques for HOT development. However, the Project rarely observed open questions during the BLS (REB & JICA, 2017). Therefore, REB and the Project developed the training program as part of the CBC induction training Phase III in order for teachers to enhance their open questioning techniques. Under the circumstances, the Project set out the following Key Performance Indicators (KPIs) to evaluate Project achievements as described in Section 1.2.2.

KPI for Project Purpose: Teachers give more open questions in model schools compared to the control schools.

KPI for Overall Goal: More students in a model school than those in a control school present relevant responses to an open question posed by a teacher.

To review how the open questioning techniques have been adopted by Rwandan teachers and the effectiveness of Lesson Study to the model schools, we analyzed the frequency of open questions and the responses.

#### (1) Open Questions by Teachers

Table 2-5 shows the average frequency of open questions by intervention (treatment and control), school levels and subjects. In comparison between frequency of the treatment and the control group, the higher one in each row is colored in grey.

**Table 2-5: Frequency of Open Questions by Teachers (Average)**

| Level | Subject | TRT | | CTR | |
|---|---|---|---|---|---|
| | | *n* | Frequency (%) | *n* | Frequency (%) |
| PS | Math | 3 | 1.0 | 3 | 0.5 |
| | Science | 3 | 9.3 | 3 | 4.5 |
| LS (O' Level) | Math | 4 | 2.2 | 4 | 0.2 |
| | Science | 5 | 6.3 | 4 | 5.5 |
| US (A' Level) | Math | 4 | 2.2 | 2 | 1.3 |
| | Science | 4 | 5.2 | 2 | 10.0 |

*n*: Number of lessons observed.
Higher values are indicated in grey in comparison of TRT and CTR.

Overall, teachers in Rwanda seemed to ask open questions more than previously. In addition, teachers in the treatment group used more open questions than those in the control group (as grey cells appeared more in the treatment group).

In the treatment group, for example, the following open questions appeared in the lessons.

"The square has fifty meters, this fifty meters has side, is 50m *[sic]*. How can we calculate the distance or the perimeters of that square?" (P5 math)

"How can you use to justify that PN is equal to NR?" (S2 math)

"Now, what is your conclusion? We got a case like this to the set s1 and s2? What is the conclusion here?" (S5 math)

"How can we sustain our environment?" (P5 SET)

"So, what is the function of this chlorophyll, in this process, chlorophyll, why do we put here, chlorophyll, what is the function of chlorophyll?" (S2 biology)

"Can you please give us the small reason why they are less reactive compare to group one element?" (S4 chemistry)

In addition, teachers in the treatment group often asked "why" when learners gave a certain answer, for example. They tried to stimulate learners to think more deeply.

**Box 2-1: Why mathematics teachers use fewer open questions than science?**

We found that teachers in science lessons tend to use more open questions than in mathematics. The reason is that there are various ways to describe the behavior of nature. To the contrary, mathematical answers are uniquely determined in general. Thus, teachers in mathematics classes may use more closed questions than open questions to reach intended solutions or answers.

### (2) Responses by Students

Table 2-6 shows the average frequency of open-ended responses by intervention (the treatment and control), school levels and subjects. Although the KPI offers to argue frequency of responses against the open questions, we noticed that open-ended replies were given even with closed questions, rephrases or confirmations. Moreover, some teachers encouraged students to make presentations in explaining their findings. Therefore, we reviewed open-ended responses regardless of the teacher's questioning/direction type. There are three types of open-ended responses in the coding rule; "Opinion to teacher (Op-T)", "Opinion to another student (Op-S)", and "Presentation (Pr)". We added frequencies of them to find the average frequency of open-ended responses.

**Table 2-6: Frequency of Open-ended Responses by Students (Average)**

| Level | Subject | TRT | | CTR | |
|---|---|---|---|---|---|
| | | *n* | Frequency (%) | *n* | Frequency (%) |
| PS | Math | 3 | 11.1 | 3 | 16.3 |
| | Science | 3 | 14.3 | 3 | 9.1 |
| LS (O' Level) | Math | 4 | 20.6 | 4 | 15.5 |
| | Science | 5 | 20.6 | 4 | 15.5 |
| US (A' Level) | Math | 4 | 54.7 | 2 | 34.2 |
| | Science | 4 | 28.5 | 2 | 10.4 |

*n*: Number of lessons observed.

Higher values are indicated in grey in comparison of TRT and CTR.

Again, we highlighted the more frequent occurrence in grey. Similar to the previous sub-section, students in the treatment group were given more opportunities to express open-ended responses than those in the control group.

Examples of learners' responses that appeared in the lessons are as follows:

"I borrow one from seven and remains six. Ten minus five equals five. I put a dot. Six minus zero equals six. The answer is 6.5. Then 6.5 minus 0.5, five minus five equals zero, six minus zero equals six." (P5 math)

"Midpoint it help to build a house.[sic]" (S2 math)

"My conclusion is, a vector are spanning set, because, we have seen the value of unknown vector[sic]." (S5 math)

"Soil erosion, second one is flood, third one is deforestation, and forth one is the animals. They don't ha…, they don't have food. .[sic]" (P5 SET)

"So in this topic, it shows us that photosynthesis, it helps us to get the plant we use." (S2 biology)

"The reason is this. According to group two element, we have seen that there is a strong electrostatic or a strong bond which hold the mega and outer most electrons. This means that it will be difficult to bond with other element compare to group one element, which means that group two elements have strong electrostatic force compare to group one element." (S4 chemistry)

They tried to put their thoughts into words, in response to the teacher's facilitation.
All these facts imply that Lesson Study effectively changed lessons in model schools in the desired direction.

### 2.2.3 Comparison of Degree of Learner-Centered Methodology (LCM)

#### (1) Teachers' Facilitation

A teacher uses talks to support learning and for teaching. We assumed that a teacher who became familiar with Learner-Centered Methodology (LCM) through Lesson Study used more dialogues for supporting learning and less for teaching. To verify this assumption, we attempted to compare the degree of LCM by intervention (treatment and control), school levels and subjects. We classified teacher codes to create new "combined codes" as shown in Table 2-7. In our coding rules, "Explanation (Xpl)" is assigned when a teacher conveys a subject matter and "Justification (Jst)" is given when a teacher judges true or not true. We considered they were the codes assigned when a teacher directly taught a subject matter. Whereas, "Questioning" (Closed/Open Question), "Scaffolding" (Instruction, Rephrase) and "Indirect feedback" (Confirmation, Encouragement) appears when the teacher supports students' learning. We eliminated "Others" from this analysis to focus on essential classroom practice.

**Table 2-7: Classification of Combined Teacher Codes**

| Major Category | Sub-Category | Code | Acronym |
|---|---|---|---|
| Learning support | Questioning | Closed Question | CQ |
| | | Open Question | OQ |
| | Scaffolding | Instruction | Inst |
| | | Rephrase Teacher/Students | Rph-T/S |
| | Indirect feedback | Confirmation | Cmf |
| | | Encouragement | Enc |
| Teaching | Direct feedback | Justification | Jst |
| | Explanation | Explanation | Xpl |
| Others | Class Control | Call attention | Agr |
| | | Point student | Po |
| | | Clap | Cl |
| | Other | Impossible to listen | Imp |
| | | Others | Oth |

Table 2-8 and Table 2-9 show the rate of frequency for each combined teacher code for mathematics and science respectively.

**Table 2-8: Frequency of Combined Teacher Code in Mathematics (Average in %)**

| Major Category | Sub-Category | PS | | LS (O' Level) | | US (A' Level) | |
|---|---|---|---|---|---|---|---|
| | | TRT | CTR | TRT | CTR | TRT | CTR |
| Learning support | Questioning | 36.6 | 24.8 | 18.1 | 18.4 | 28.4 | 17.4 |
| | Scaffolding | 22.2 | 24.0 | 25.5 | 17.0 | 31.2 | 16.5 |
| | Indirect feedback | 29.7 | 24.5 | 33.8 | 32.4 | 21.1 | 26.4 |
| Teaching | Direct feedback | 1.0 | 9.8 | 4.2 | 8.0 | 6.5 | 6.6 |
| | Explanation | 10.6 | 16.9 | 18.4 | 24.1 | 12.8 | 33.1 |
| Learning support total | | 88.4 | 73.3 | 77.5 | 67.8 | 80.6 | 60.3 |
| Teaching total | | 11.6 | 26.7 | 22.5 | 32.2 | 19.4 | 39.7 |

**Table 2-9: Frequency of Combined Teacher Code in Science (Average in %)**

| Major Category | Sub-Category | PS | | LS (O' Level) | | US (A' Level) | |
|---|---|---|---|---|---|---|---|
| | | TRT | CTR | TRT | CTR | TRT | CTR |
| Learning support | Questioning | 28.8 | 25.2 | 25.0 | 25.7 | 23.8 | 39.1 |
| | Scaffolding | 27.6 | 20.6 | 20.2 | 22.7 | 23.8 | 10.9 |
| | Indirect feedback | 26.0 | 39.5 | 25.9 | 30.3 | 20.2 | 14.1 |
| Teaching | Direct feedback | 3.6 | 2.6 | 9.3 | 5.8 | 3.8 | 6.3 |
| | Explanation | 14.0 | 12.1 | 19.5 | 15.4 | 28.4 | 29.7 |
| Learning support total | | 82.4 | 85.3 | 71.1 | 78.8 | 67.7 | 64.1 |
| Teaching total | | 17.6 | 14.7 | 28.9 | 21.2 | 32.3 | 35.9 |

In mathematics, we found that the rate of "Teaching" code frequency in the control group is higher than that in the treatment group (conversely, the rate of "Learning support" code frequency is higher in the treatment group). This implies that teachers in the control group directly taught subject matters, whereas teachers in the treatment group used more dialogue to support learning. Unlike mathematics, we could not find such a trend in the rate of "Teaching" code frequency in science. Trends of the treatment and the control group were similar or even higher in the treatment group than the control group in primary and lower secondary levels. These trends are summarized in Figure 2-4 (Arrows in the graph highlight the places where the treatment group is higher).

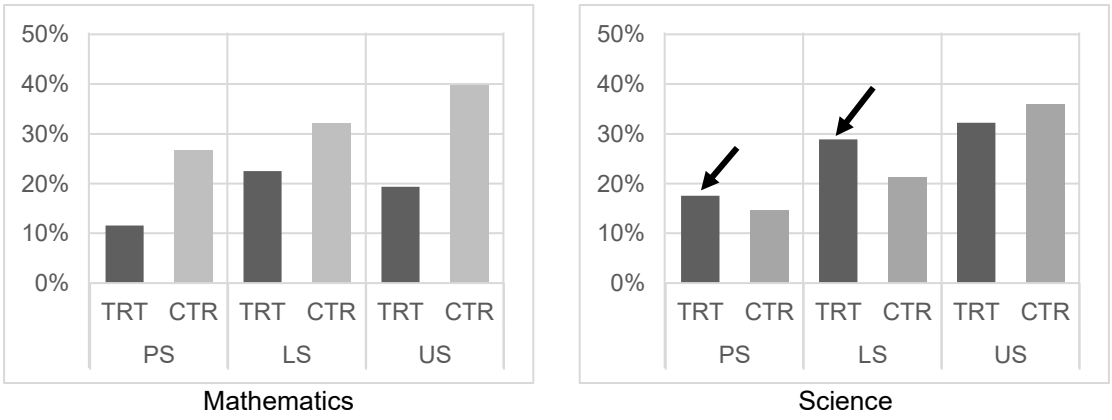



**Figure 2-4: Rate of Teaching by Intervention and School Level**

### (2) Dialogues among students

We also assumed that LCM activates communication among students compared to "teacher-centered lesson" where students just respond to teachers. We thus, classified learner codes into "To teacher" and "To students" as shown in Table 2-10. We eliminated "Others" from this analysis to focus on essential classroom practice.

**Table 2-10: Classification of Combined Learner Codes**

| Major Category | Sub-Category | Code | Acronym |
|---|---|---|---|
| To teacher | Reaction | Yes / No answer to teacher | Yn-T |
| | | One term answer to teacher | Num-T |
| | | Repeating or just reading | Rd |
| | | Silent to teacher | Na-T |
| | Active response | Opinion to teacher | Op-T |
| | | Question to teacher | Qst-T |
| | | Writing or Gesture to teacher | Wrt-T |
| To students | Reaction | Yes / No answer to another student | Yn-S |
| | | One term answer to another student | Num-S |
| | | Silent to another student | Na-S |
| | Active response | Opinion to another student | Op-S |
| | | Question to another student | Qst-S |
| | | Writing or Gesture to another student | Wrt-S |
| | | Presentation | Pr |
| Others | Class control | Point student | Po |
| | | Clap | Cl |
| | Other | Incomplete answer | Inc |
| | | Impossible to listen | Imp |
| | | Others | Oth |

**Table 2-11: Frequency of Combined Learner Codes in Mathematics (Average in %)**

| Major Category | Sub-Category | PS | | LS (O' Level) | | US (A' Level) | |
|---|---|---|---|---|---|---|---|
| | | TRT | CTR | TRT | CTR | TRT | CTR |
| To teacher | Reactions | 79.6 | 82.6 | 79.3 | 69.1 | 36.9 | 51.0 |
| | Active response | 13.2 | 15.9 | 14.0 | 29.0 | 28.5 | 46.9 |
| To students | Reactions | 1.8 | 0.0 | 0.7 | 0.6 | 1.5 | 0.0 |
| | Active response | 5.4 | 1.4 | 6.0 | 1.2 | 33.0 | 2.0 |
| | To teacher total | 92.8 | 98.6 | 93.3 | 98.1 | 65.5 | 98.0 |
| | To students total | 7.2 | 1.4 | 6.7 | 1.9 | 34.5 | 2.0 |

**Table 2-12: Frequency of Combined Learner Codes in Science (Average in %)**

| Major Category | Sub-Category | PS | | LS (O' Level) | | US (A' Level) | |
|---|---|---|---|---|---|---|---|
| | | TRT | CTR | TRT | CTR | TRT | CTR |
| To teacher | Reactions | 68.5 | 83.9 | 65.6 | 73.0 | 60.8 | 81.3 |
| | Active response | 24.1 | 15.1 | 26.1 | 23.0 | 18.1 | 16.7 |
| To students | Reactions | 1.2 | 0.0 | 1.0 | 0.9 | 0.6 | 0.0 |
| | Active response | 6.2 | 1.0 | 7.2 | 3.2 | 20.5 | 2.1 |
| | To teacher total | 92.6 | 99.0 | 91.8 | 95.9 | 78.9 | 97.9 |
| | To students total | 7.4 | 1.0 | 8.2 | 4.1 | 21.1 | 2.1 |

We found similar trends both in mathematics and science. The rate of "To students" code frequency in the treatment group is higher than that in the control group at all levels (conversely, the rate of "To teacher" code frequency is higher in the control group). It implies that communication among students in the treatment group was more active, whereas students in the control group tended to communicate with the teacher. These trends are summarized in Figure 2-5.

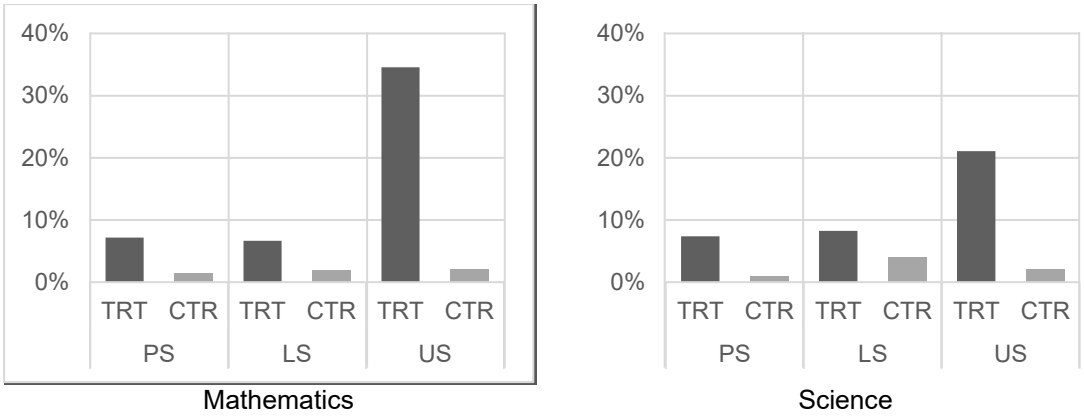



**Figure 2-5: Rate of Interaction among Students by Intervention and School Level**

## 2.3 Teachers' Perception on CBC

As described in previous sub-sections, various evidence supports that lessons in the treatment group changed in a positive direction in relation to CBC, although there were some exceptional cases. Questionnaire responses also suggest the similar trend that teachers in the treatment group changed their perception or awareness of CBC in a desirable direction.

**Table 2-13: Teachers' Perception on Lesson Delivery**

| | | Statement | TRT | CTR | |
|---|---|---|---|---|---|
| R | 1. | CBC should always include group work. | 2.47 | 2.92 | * |
| R | 2. | Lesson conclusion should be given by teacher. | 2.40 | 2.68 | |
| R | 3. | Blackboard writing should be erased when students solve assessment question at the end of a lesson. | 2.33 | 2.74 | + |
| R | 4. | When a student gives a wrong answer, teacher should call another student to get correct answer immediately. | 2.09 | 2.13 | |
| R | 5. | When students do not understand a concept, it is because students do not study harder. | 1.76 | 1.92 | |
| | 6. | When students do not understand a learning concept, it is because the teacher did not use effective L/T strategies. | 2.58 | 2.68 | |
| R | 7. | Teachers should rely on students' oral responses than students' face expressions and behaviors for formative assessment. | 2.20 | 2.63 | * |
| R | 8. | To treat learners equal, teachers should provide the same instruction to all learners regardless of their understanding. | 3.04 | 2.95 | |
| | 9. | Calling on students purposefully who make mistakes is good learning opportunities for the class. | 2.91 | 2.87 | |
| | 10. | I encourage my students to explain why they reached a certain answer in my class. | 3.56 | 3.50 | |
| | 11. | I give students enough time to think before they answer a question. | 3.51 | 3.61 | |
| R | 12. | Good questions should always have only one correct answer. | 2.27 | 2.24 | |
| R | 13. | Students should respond to questions immediately. | 2.04 | 2.24 | |
| R | 14. | Lesson should introduce one particular and standard solution only. | 2.29 | 2.18 | |

*$p<.05$, +$p<.10$

Table 2-13 represents the average scores on how teachers in the treatment and the control groups understand specific teaching behaviors. Questions were prepared based on "misconceptions" confirmed by the Project throughout the project activities. Likert Scale questions (four-level grading; 1: strongly disagree, 2: disagree, 3: agree, 4: strongly agree) were given to teachers to rate their degree of agreement. "R" in the left column represents the "Reverse items" that "1: strongly disagree" is the preferable or expected response (meaning a lower score is desired). For example, CBC requires various learning activities according to the learning needs and "group work" is one of the symbolic LCMs, but not the only technique for CBC (thus we value a negative response for Q1). We also believe that assessment questions in CBC are not just ones recalling students' prior knowledge, but ask them to apply what they learned to develop their HOT (hence Q3 expects a negative response, too).
T-test detected significant differences in Q1, Q3 and Q7. As the average scores of the treatment group are lower than those of the control group, teachers in the treatment group demonstrated better understanding particularly in these questions.

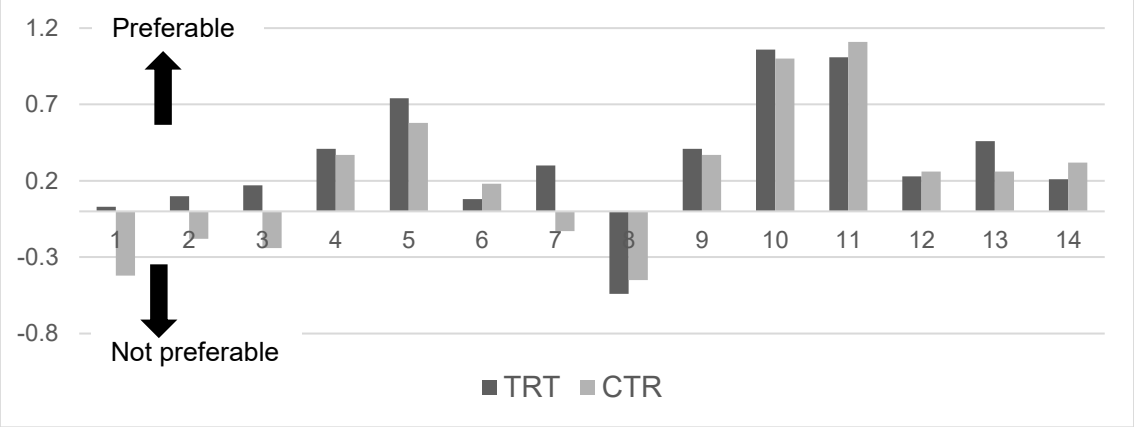



**Figure 2-6: Degree of Preference by Question**

As the grading scale ranges between 1 to 4, the boundary of positive and negative response is 2.5. Figure 2-6 represents the gaps between the average scores and 2.5 boundary for each question. We inverted scores for reverse items to make desirable answers positive for easy comparison. The average scores of the treatment group (except for Q8) are all positive, whereas scores for five questions are negative in the control group. This implies that the transition to CBC in the treatment group is much smoother than in the control group.

# 3. Learning Achievement

The "indirect teaching" in lessons of the treatment group seems to have made a positive impact on learners performance in the Academic Achievement Tests (AAT).

- Overall, the AAT results in the treatment group were better than those in the control group with a significant difference. Academic performance was higher in the treatment group.
- In most cases, the effect size in the treatment group was bigger than the control group, meaning the degree of academic improvements were higher in the treatment group.

Chapter 2 discusses the difference of lessons between the treatment and the control groups. The findings suggest that teachers in the treatment group attempted to teach the subject "indirectly". They commonly used "questioning", "rephrasing" "confirmation" and "encouragement" to prompt learners to think and avoided giving answers directly compared to teachers in the control group. In addition, open-ended questions and responses were observed more in the treatment group.

Flanders (1965) revealed that academic achievement of students who were taught in such an "indirect manner" was significantly higher than those who were taught with direct teaching. Various research also suggests that open questioning supports children's acquisition of HOT skills which are needed to solve complicated problems (i.e. Blosser, 2000).

Did the "indirect teaching" really improve academic achievement of Rwandan students, too? This chapter discusses the results of AAT administered in the treatment and the control groups.

## 3.1 Analysis of Academic Achievement Test (AAT) Results

When we designed this experiment, we reviewed Pupil Classroom Rate (PCR), Pass Rate (PR) of national exams and Graduation Rate (GR) in 2018 to compare performance of the treatment and the control groups as described in 1.3.2. We concluded that the last year's performances were similar to each other so that we could assume AAT results theoretically would be the same.

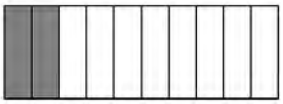
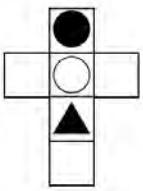
### 3.1.1 Composition of AATs

Multiple-choice type mathematics and science tests were employed for ELS as described in section 1.4.1. They were designed by the Project experts for P4, S1 and S4 students at BLS to assess the initial level of learners before starting Lesson Study. Those students who sat for BLS at model schools in 2017 theoretically promoted to P6, S3 and S6 respectively. They should have fully received the treatment effects from teachers throughout the project period, and presumably, could attain better AAT results than those in the control group. Hence AATs targeted these grades for comparison.

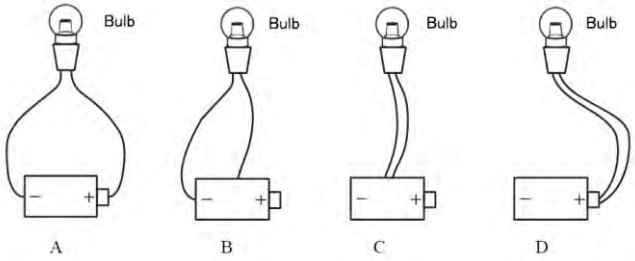
The questions in the tests were basically chosen from new CBC-based textbooks authorized by REB, and some were selected from major international assessment tests such as Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA). The questions covered content up to P4, S1 and S4 for primary, lower secondary and upper secondary level tests respectively. Considering the variety of combinations of majors in upper secondary level (A' Level), most questions for the S4 test were set from what they learned by the end of lower (O' Level) to fairly assess and compare essential mathematics and science achievement regardless of majors. Questions consist of two types: one is basic questions requiring knowledge, comprehension and operational skills (lower order thinking skills), and the other is applied questions[4] requiring HOT skills. Examples of questions for mathematics and science are shown in Table 3-1 and Table 3-2 (Entire test papers are available in Appendix H).

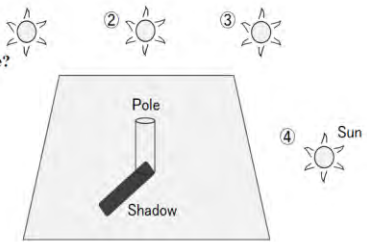
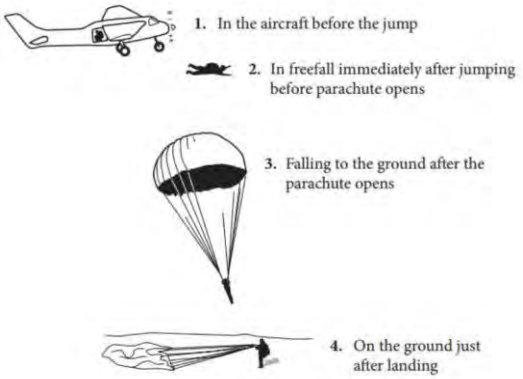
[4] Applied questions are referred to as "Application" hereafter.

## Table 3-1: Examples of Mathematics Questions

| | |
|---|---|
| Primary level (Basic) | 19. Calculate/ **Erekana igisubizo nyacyo**: 19.82 – 5.28<br>A. 14.64 B. 14.54 C. 14.66 D. 14 |
| Primary level (Application) | 9. Divide : 24.6 ÷ 0.04 .<br>A. 0.615 B. 6.15 C. 61.5 D. 615 |
| Secondary level (Basic) | 16. Which decimal number does the following shaded part express?/ **Mu mibare y' ibice ikurikira ni uwuhe ungana n'ahasharuye mu mbonerahamwe ?**<br>  <br>A. 2.8 B. 0.5 C. 0.2 D. 0.02 |
| Secondary level (Application) | 34. Which of the following cubes could be made by folding the figure below?<br>  <br> |

## Table 3-2: Examples of Science Questions

| | |
|---|---|
| Primary level (Basic) | 12. Which diagram shows the connection that can make the bulb light?<br>**Ni ikihe gishushanyo cyerekana uburyo urumuri rwo mu itara ruboneka?**<br>  |
| Primary level (Application) | ***Question 3***<br>Bacteria that enter the body are destroyed by which type of cells?<br>A. white blood cells<br>B. red blood cells<br>C. kidney cells<br>D. lung cells |

| | |
|---|---|
| Secondary level (Basic) | 9. Shadow of the pole is formed on the ground. Where does the Sun locate at?<br>**Niba Igicucu cya Pole cyiremye hasi. Izuba rihereereye he?**<br>A. ①<br>B. ②<br>C. ③<br>D. ④<br>  |
| Secondary level (Application) | ***Question 14***<br>The figure shows a parachute jumper in four positions.<br>In which of the positions does the force of gravity act on the jumper?<br>A. Position 2 only.<br>B. Positions 2 and 3 only.<br>C. Positions 1, 2 and 3 only.<br>D. Positions 1, 2, 3, and 4.<br>  |

### 3.1.2 Results of Analysis

Table 3-3 and Table 3-4 show descriptive statistics of AAT results by school levels and question type (basic/application) for mathematics and science respectively. In Rwanda, students who performed well in the national exam are promoted to Secondary Schools, and the rest are enrolled in 9/12-Year Basic Education Schools. Thus, Secondary Schools and 9/12-Year Basic Education Schools show quite different trends in terms of academic performance. We then decided to separately analyze Secondary Schools' and 9/12-Year Basic Education Schools' results. The survey could not administer AAT at GS Gihogwe which was the only 12-Year Basic Education school in the control group, so we eliminated comparative analysis for '12-Year Basic Education at upper secondary level' from this survey.

**Table 3-3: Comparison of AAT Results by Intervention and School Level (Mathematics)**

| Level | Question Type | TRT | | | CTR | | | |
|---|---|---|---|---|---|---|---|---|
| | | *n* | *Ave.* | *SD* | *n* | *Ave.* | *SD* | |
| PS | Total (33) | 203 | 14.8 | 4.5 | 246 | 13.1 | 4.1 | ** |
| | Basic (24) | | 12.4 | 3.6 | | 10.9 | 3.3 | ** |
| | Application (9) | | 2.5 | 1.5 | | 2.1 | 1.4 | * |
| LS (SS) O' Level | Total (40) | 138 | 24.4 | 6.3 | 65 | 19.6 | 5.5 | ** |
| | Basic (24) | | 16.8 | 3.8 | | 13.7 | 3.9 | ** |
| | Application (16) | | 7.6 | 3.1 | | 6.0 | 2.6 | ** |
| LS (9/12) O' Level | Total (40) | 86 | 15.5 | 4.8 | 123 | 13.5 | 4.4 | ** |
| | Basic (24) | | 10.8 | 3.5 | | 9.4 | 3.2 | ** |
| | Application (16) | | 4.7 | 2.3 | | 4.1 | 2.3 | * |
| US (SS) A' Level | Total (40) | 193 | 24.9 | 6.1 | 106 | 20.3 | 5.8 | ** |
| | Basic (24) | | 17.1 | 3.9 | | 14.1 | 3.9 | ** |
| | Application (16) | | 7.9 | 2.8 | | 6.2 | 2.5 | ** |

**$p<.01$, *$p<.05$

Figures in parentheses for "Question Type" represents the number of questions given to students. Each question is worth one mark.

Higher scores are indicated in grey in comparison of TRT and CTR.

**Table 3-4: Comparison of AAT Results by InterventSchool Level (Science)**

| Level | Question Type | TRT | | | CTR | | | |
|---|---|---|---|---|---|---|---|---|
| | | *n* | *Ave.* | *SD* | *n* | *Ave.* | *SD* | |
| PS | Total (13) | 219 | 7.4 | 2.4 | 253 | 6.0 | 2.5 | ** |
| | Basic (7) | | 5.2 | 1.4 | | 4.3 | 1.7 | ** |
| | Application (6) | | 2.2 | 1.4 | | 1.8 | 1.4 | ** |
| LS (SS) O' Level | Total (24) | 155 | 12.6 | 3.4 | 65 | 12.5 | 3.0 | |
| | Basic (15) | | 9.5 | 2.3 | | 9.7 | 2.4 | |
| | Application (9) | | 3.1 | 1.7 | | 2.9 | 1.6 | |
| LS (9/12) O' Level | Total (24) | 70 | 8.7 | 2.8 | 121 | 7.7 | 2.3 | * |
| | Basic (15) | | 6.3 | 2.1 | | 5.7 | 2.2 | + |
| | Application (9) | | 2.4 | 1.5 | | 2.0 | 1.2 | + |
| US (SS) A' Level | Total (40) | 178 | 19.6 | 4.6 | 54 | 17.1 | 5.0 | ** |
| | Basic (24) | | 12.1 | 2.9 | | 10.2 | 3.3 | ** |
| | Application (16) | | 7.3 | 2.3 | | 6.9 | 2.2 | + |

**$p$<.01, *$p$<.05, +$p$<.10
Figures in parentheses for "Question Type" represents the number of questions given to students. Each question is worth one mark.
Higher scores are indicated in grey in comparison of TRT and CTR.

Figures in parentheses for "Question Type" represents the number of questions given to students. Each question gives one mark and thus, these figures are equal to the maximum scores (full marks) for each row. In comparing the average scores of the treatment and the control groups, the higher score in each row is colored in grey. If T-test detected a statistically significant difference, a specific symbol ("**", "*" or "+") was added.

In mathematics, the average scores of the treatment group were significantly higher than those of the control group in all question types at all levels. Thus, we can conclude that the overall academic performance was better in the treatment group than in the control group.

In science, the average scores of the treatment group were significantly higher than those of the control group in all question types at all levels except for secondary school's lower secondary level. As described in 2.2.3 (1), the discourse analysis found the trend in science lessons that teachers in the treatment group still rely on "direct teaching" more than those in the control group at the lower secondary level. This may be the reason why the average score of the treatment group was lower only in science of lower secondary level.

Overall, the AAT results in the treatment group were better than those in the control group with a statistically significant difference. It implies that the "indirect teaching" induced by Lesson Study improved students' performance in treatment group.

## 3.2 Extra Analysis – Improvement in three years

As mentioned, we administered the AATs for P4/S1/S4 students in June 2017 for BLS in model (treatment) schools to diagnose their weaknesses. BLS and ELS used the same tests so that we could assess the magnitude of improvement from P4/S1/S4 to P6/S3/S6 respectively in model schools[5]. We considered that the similar assessment in the control group might give us fruitful insights, and therefore, administered the same tests for P4/S1/S4 students in the control group in February 2019. Then, we compared the results. As the data collection timing is different between the groups, it is inappropriate to apply statistical test to this comparison. We computed the "effect size" to estimate the degree of improvement for each school instead.

[5] GS Mukarange and GS NDA Rwaza joined the Project in 2018 and P4/S1/S4 data was collected in February 2019 together with the control group.

**Box 3-1: What is Effect Size?**

Effect size is a way of quantifying the size of the difference between two groups and can be applied to any measured outcome in education (Coe, 2002). It is particularly valuable for quantifying the effectiveness of a particular intervention. Effect size is symbolized by "*d*" and its magnitude is commonly represented with the scale shown in the table.

* Cohen. (1988). Statistical Power Analysis for the Behavioral Sciences.
** Sawilowsky. (2009). New effect size rules of thumb.

| Effect Size | *d* |
|---|---|
| Very small* | 0.01 |
| Small** | 0.20 |
| Medium** | 0.50 |
| Large** | 0.80 |
| Very large* | 1.20 |
| Huge* | 2.00 |

As the data collection timing is quite spread out between the groups, it is difficult to argue which group experienced better improvement. However, we assumed that the effect size for the control group was theoretically supposed to be bigger. The AATs for P4/S1/S4 for the control group were administered in February, which is four months earlier than the treatment group. Therefore, the scores were supposed to be lower than the treatment group, which took the tests in June.

The overall results are summarized in Table 3-5 and detailed results for each school by subject and school level are shown in Table 3-6 to Table 3-11 (effect sizes are presented in "*d*" in these tables).

**Table 3-5: Comparison of Effect Size by Subject and School Level (Average)**

| Level | Subject | TRT | | | CTR | | |
|---|---|---|---|---|---|---|---|
| | | Total | Basic | Application | Total | Basic | Application |
| All | Math | **1.009** | **0.837** | **0.804** | 0.693 | 0.559 | 0.503 |
| | Science | **1.091** | **1.071** | 0.693 | **0.905** | **0.910** | 0.618 |
| PS | Math | **1.857** | **1.834** | **1.035** | **1.503** | **1.502** | 0.795 |
| | Science | **1.752** | **1.639** | **1.187** | **1.413** | **1.427** | **0.819** |
| LS | Math | **0.945** | 0.703 | **0.855** | 0.622 | 0.362 | 0.550 |
| | Science | 0.670 | 0.681 | 0.300 | **0.917** | **0.977** | 0.580 |
| US | Math | 0.226 | -0.026 | 0.522 | -0.047 | -0.186 | 0.166 |
| | Science | **0.850** | **0.892** | 0.594 | 0.386 | 0.325 | 0.456 |

Grey: Higher figures in comparison of TRT and CTR, Bold: Figures exceed 0.80

In Table 3-5, figures colored in grey represent the bigger effect size between the treatment and control groups. **Bold** figures indicate scores above 0.80 which represents the improvement is "Large" or more. Overall, the improvement from P4/S1/S4 to P6/S3/S6 tended to be bigger in the treatment group than in the control group except for lower secondary science. The trend is very similar to the previous analysis.

It implies that the treatment group provides a more effective education program than the control group and Lesson Study may contribute to enhancing that effectiveness.

We found a surprising trend here that, in mathematics at upper secondary level, the improvements are small or even both the treatment and the control groups indicate a negative effect size in basic questions, meaning the average scores of S6 students for basic questions became worse than those of S4. We are not sure what the reason behind this is as this is out of the scope of the ELS. However, we guess, as questions in the AATs for upper secondary level were mostly taken from primary and lower secondary textbooks to minimize the influence of combination of majors as described in 3.1.1, students may have forgot what they learned in the past. Even with this situation, the effect size for application questions in the treatment group is relatively high, so Lesson Study may have enhanced HOT skills of those students after all.

**Table 3-6: Comparison of P4 and P6 Achievement by School (Mathematics)**

| Group | School | Grade | *n* | Total (33) | | | Basic (24) | | | Application (9) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* |
| TRT | GS Kabuye | P4 | 171 | 9.5 | 3.3 | 2.257 | 7.8 | 3.0 | 2.244 | 1.6 | 1.2 | 1.221 |
| | | P6 | 128 | 15.8 | 4.3 | | 13.0 | 3.3 | | 2.8 | 1.5 | |
| | EP Buhande | P4 | 21 | 7.8 | 2.6 | 1.057 | 7.2 | 2.1 | 0.822 | 0.6 | 0.9 | 1.126 |
| | | P6 | 36 | 11.8 | 4.7 | | 9.7 | 3.8 | | 2.1 | 1.5 | |
| | GS Mukarange | P4 | 36 | 6.0 | 3.6 | 2.257 | 5.3 | 3.1 | 2.436 | 0.7 | 0.9 | 0.759 |
| | | P6 | 39 | 14.5 | 3.9 | | 12.8 | 3.2 | | 1.7 | 1.1 | |
| CTR | GS Gihogwe | P4 | 64 | 8.9 | 3.9 | 1.341 | 7.6 | 3.3 | 1.273 | 1.3 | 1.1 | 0.871 |
| | | P6 | 137 | 13.9 | 3.6 | | 11.5 | 2.8 | | 2.4 | 1.4 | |
| | GS Bubazi | P4 | 35 | 4.5 | 3.1 | 2.218 | 3.9 | 2.3 | 2.387 | 0.6 | 1.2 | 0.761 |
| | | P6 | 48 | 12.9 | 5.1 | | 11.3 | 4.1 | | 1.6 | 1.4 | |
| | EP Bukinanyana | P4 | 56 | 7.6 | 3.1 | 0.949 | 6.7 | 2.6 | 0.845 | 1.0 | 0.9 | 0.752 |
| | | P6 | 61 | 11.2 | 3.5 | | 9.3 | 3.0 | | 1.9 | 1.4 | |

**Table 3-7: Comparison of S1 and S3 Achievement by School (Mathematics)**

| Group | School | Type | Grade | *n* | Total (40) | | | Basic (24) | | | Application (16) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* |
| TRT | GS St Aloys R | SS | S1 | 66 | 20.7 | 5.4 | 0.919 | 14.0 | 4.3 | 0.598 | 5.6 | 2.1 | 0.936 |
| | | | S3 | 56 | 25.7 | 6.1 | | 16.2 | 4.3 | | 7.8 | 3.3 | |
| | GS APAGIE | SS | S1 | 64 | 20.7 | 5.4 | 1.045 | 14.8 | 3.5 | 0.830 | 5.9 | 2.6 | 0.972 |
| | | | S3 | 47 | 25.7 | 6.1 | | 17.6 | 3.6 | | 8.1 | 3.1 | |
| | GS NDA Rwaza | SS (girls) | S1 | 34 | 17.1 | 3.9 | 1.138 | 12.8 | 3.1 | 0.792 | 4.3 | 1.7 | 1.100 |
| | | | S3 | 35 | 23.6 | 4.7 | | 16.7 | 3.0 | | 6.8 | 2.6 | |
| | GS Mukarange | 9/12 | S1 | 98 | 10.3 | 4.6 | 0.679 | 6.9 | 3.3 | 0.592 | 3.4 | 2.1 | 0.410 |
| | | | S3 | 45 | 13.5 | 3.6 | | 9.3 | 2.8 | | 4.2 | 1.7 | |
| | GS Kabuye[6] | 9/12 | S1 | - | - | - | - | - | - | - | - | - | - |
| | | | S3 | 41 | 17.7 | 5.0 | | 12.5 | 3.4 | | 5.2 | 2.7 | |
| CTR | GS Rambura G | SS | S1 | 49 | 15.9 | 6.0 | 0.304 | 11.2 | 4.2 | 0.283 | 4.8 | 2.5 | 0.222 |
| | | | S3 | 43 | 17.4 | 4.9 | | 12.1 | 3.7 | | 5.3 | 2.4 | |
| | LNDV | SS (girls) | S1 | 25 | 21.5 | 3.8 | 0.729 | 16.0 | 3.0 | 0.313 | 5.5 | 1.9 | 1.062 |
| | | | S3 | 22 | 24.0 | 3.8 | | 16.7 | 2.2 | | 7.3 | 2.3 | |
| | GS Gihogwe | 9/12 | S1 | 161 | 9.3 | 3.6 | 1.035 | 6.2 | 2.6 | 0.454 | 3.1 | 1.8 | 0.507 |
| | | | S3 | 78 | 14.2 | 4.8 | | 9.9 | 3.5 | | 4.3 | 2.4 | |
| | GS Bubazi | 9/12 | S1 | 98 | 10.3 | 3.6 | 0.420 | 7.3 | 2.7 | 0.396 | 3.0 | 2.0 | 0.410 |
| | | | S3 | 45 | 12.3 | 3.3 | | 8.6 | 2.5 | | 3.7 | 2.0 | |

**Table 3-8: Comparison of S4 and S6 Achievement by School (Mathematics)**

| Group | School | Type | Grade | *n* | Total (40) | | | Basic (24) | | | Application (16) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* |
| TRT | GS St Aloys R | SS | S4 | 125 | 21.9 | 5.2 | 0.906 | 15.0 | 3.2 | 0.824 | 6.9 | 2.8 | 0.760 |
| | | | S6 | 100 | 26.6 | 5.3 | | 17.9 | 3.3 | | 8.7 | 2.6 | |
| | GS APAGIE | SS | S4 | 45 | 21.4 | 5.8 | 0.731 | 15.8 | 4.0 | 0.355 | 5.6 | 2.4 | 1.060 |
| | | | S6 | 54 | 24.2 | 5.8 | | 16.7 | 4.1 | | 7.5 | 2.4 | |
| | GS NDA Rwaza | SS (girls) | S4 | 51 | 20.1 | 4.9 | 0.322 | 15.0 | 3.0 | 0.141 | 5.1 | 2.4 | 0.491 |
| | | | S6 | 39 | 21.7 | 6.9 | | 15.5 | 4.6 | | 6.3 | 2.8 | |
| | GS Mukarange | 9/12 | S4 | 80 | 17.7 | 3.5 | 1.057 | 13.6 | 2.5 | 1.422 | 4.1 | 1.7 | 0.223 |
| | | | S6 | 57 | 12.2 | 4.1 | ▼ | 8.6 | 3.4 | ▼ | 3.5 | 1.9 | ▼ |
| CTR | GS Rambura G | SS | S4 | 90 | 18.9 | 5.1 | 0.375 | 13.9 | 3.5 | 0.144 | 5.0 | 2.4 | 0.598 |
| | | | S6 | 87 | 20.8 | 5.9 | | 14.4 | 4.0 | | 6.5 | 2.5 | |
| | LNDV | SS (girls) | S4 | 28 | 20.1 | 4.2 | 0.469 | 14.7 | 3.2 | 0.515 | 5.4 | 1.9 | 0.267 |
| | | | S6 | 19 | 17.7 | 4.5 | ▼ | 12.9 | 3.6 | ▼ | 4.8 | 1.6 | ▼ |
| | GS Gihogwe[7] | 9/12 | S4 | 24 | 16.3 | 3.8 | - | 12.5 | 2.7 | - | 3.8 | 1.8 | - |
| | | | S6 | - | - | - | | - | - | | - | - | |

[6] GS Kabuye's lower secondary level joined Lesson Study in 2018 and thus no baseline data available for S1.
[7] We could not administer AAT for S6 in ELS.

**Table 3-9: Comparison of P4 and P6 Achievement by School (Science)**

| Group | School | Grade | *n* | Total (33) | | | Basic (24) | | | Application (9) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* |
| TRT | GS Kabuye | P4 | 170 | 4.8 | 2.2 | 1.834 | 3.6 | 1.6 | 1.706 | 1.2 | 1.0 | 1.254 |
| | | P6 | 137 | 7.9 | 2.1 | | 5.6 | 1.2 | | 2.3 | 1.3 | |
| | EP Buhande | P4 | 21 | 2.8 | 2.5 | 1.631 | 2.2 | 2.0 | 1.373 | 0.6 | 0.8 | 1.303 |
| | | P6 | 40 | 6.5 | 3.0 | | 4.3 | 1.8 | | 2.2 | 1.7 | |
| | GS Mukarange | P4 | 36 | 2.6 | 1.7 | 1.792 | 2.1 | 1.4 | 1.839 | 0.4 | 0.7 | 1.003 |
| | | P6 | 42 | 6.6 | 2.2 | | 5.0 | 1.2 | | 1.6 | 1.4 | |
| CTR | GS Gihogwe | P4 | 66 | 3.2 | 2.4 | 1.538 | 2.6 | 1.9 | 1.312 | 0.6 | 0.8 | 1.206 |
| | | P6 | 44 | 5.8 | 2.5 | | 4.1 | 1.8 | | 1.7 | 1.3 | |
| | GS Bubazi | P4 | 36 | 2.3 | 1.8 | 1.571 | 1.6 | 1.5 | 1.604 | 0.6 | 0.6 | 0.889 |
| | | P6 | 44 | 5.8 | 2.5 | | 4.1 | 1.8 | | 1.7 | 1.3 | |
| | EP Bukinanyana | P4 | 53 | 2.2 | 2.0 | 1.129 | 1.5 | 1.4 | 1.365 | 0.7 | 1.0 | 0.363 |
| | | P6 | 69 | 4.8 | 2.6 | | 3.7 | 1.8 | | 1.2 | 1.3 | |

**Table 3-10: Comparison of S1 and S3 Achievement by School (Science)**

| Group | School | Type | Grade | *n* | Total (40) | | | Basic (24) | | | Application (16) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* |
| TRT | GS St Aloys R | SS | S1 | 71 | 12.1 | 3.3 | 0.337 | 9.0 | 2.4 | 0.268 | 3.1 | 1.6 | 0.265 |
| | | | S3 | 69 | 13.0 | 4.1 | | 9.6 | 2.7 | | 3.4 | 1.8 | |
| | GS APAGIE | SS | S1 | 53 | 10.3 | 2.6 | 0.567 | 8.1 | 2.2 | 0.648 | 2.2 | 1.5 | 0.145 |
| | | | S3 | 48 | 11.9 | 2.8 | | 9.5 | 2.0 | | 2.4 | 1.5 | |
| | GS NDA Rwaza | SS (girls) | S1 | 44 | 9.4 | 2.5 | 1.229 | 7.1 | 1.7 | 1.079 | 2.3 | 1.5 | 0.810 |
| | | | S3 | 38 | 12.8 | 2.6 | | 9.4 | 2.1 | | 3.4 | 1.4 | |
| | GS Mukarange | 9/12 | S1 | 154 | 6.4 | 2.5 | 0.546 | 4.3 | 2.1 | 0.730 | 2.1 | 1.3 | 0.021 |
| | | | S3 | 45 | 7.9 | 2.7 | | 5.9 | 2.1 | | 2.0 | 1.5 | ▼ |
| | GS Kabuye[8] | 9/12 | S1 | - | - | - | - | - | - | - | - | - | - |
| | | | S3 | 25 | 10.1 | 2.4 | | 7.2 | 2.0 | | 3.0 | 1.3 | |
| CTR | GS Rambura G | SS | S1 | 62 | 10.7 | 2.6 | 0.554 | 8.6 | 2.1 | 0.963 | 2.2 | 1.3 | 0.466 |
| | | | S3 | 44 | 13.5 | 2.4 | | 10.6 | 1.8 | | 2.8 | 1.5 | |
| | LNDV | SS (girls) | S1 | 22 | 7.7 | 2.4 | 1.403 | 6.1 | 2.0 | 0.988 | 1.6 | 1.0 | 1.293 |
| | | | S3 | 21 | 10.6 | 3.4 | | 7.7 | 2.4 | | 3.0 | 1.8 | |
| | GS Gihogwe | 9/12 | S1 | 68 | 5.8 | 2.5 | 0.698 | 4.0 | 2.0 | 0.839 | 1.8 | 1.3 | 0.238 |
| | | | S3 | 73 | 7.8 | 2.2 | | 5.8 | 2.1 | | 2.0 | 1.1 | |
| | GS Bubazi | 9/12 | S1 | 92 | 4.8 | 3.1 | 1.014 | 3.2 | 2.1 | 1.119 | 1.6 | 1.4 | 0.321 |
| | | | S3 | 48 | 7.6 | 2.5 | | 5.6 | 2.0 | | 2.1 | 1.2 | |

**Table 3-11: Comparison of S4 and S6 Achievement by School (Science)**

| Group | School | Type | Grade | *n* | Total (40) | | | Basic (24) | | | Application (16) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* | *Ave.* | *SD* | *d* |
| TRT | GS St Aloys R | SS | S4 | 78 | 19.9 | 3.8 | 0.770 | 12.1 | 2.6 | 0.733 | 7.9 | 2.0 | 0.544 |
| | | | S6 | 64 | 22.3 | 4.1 | | 13.6 | 2.7 | | 8.7 | 2.2 | |
| | GS APAGIE | SS | S4 | 52 | 14.8 | 4.9 | 0.888 | 9.4 | 3.4 | 0.662 | 5.4 | 2.3 | 0.702 |
| | | | S6 | 37 | 18.1 | 4.8 | | 11.2 | 3.2 | | 6.9 | 2.2 | |
| | GS NDA Rwaza | SS (girls) | S4 | 50 | 13.7 | 4.2 | 0.750 | 8.1 | 2.8 | 1.167 | 5.6 | 2.1 | 0.509 |
| | | | S6 | 77 | 18.0 | 3.6 | | 11.3 | 2.4 | | 6.7 | 1.9 | |
| | GS Mukarange | 9/12 | S4 | 34 | 10.6 | 3.0 | 0.992 | 6.2 | 2.0 | 1.005 | 4.4 | 1.7 | 0.619 |
| | | | S6 | 14 | 14.7 | 2.9 | | 9.0 | 2.0 | | 5.7 | 1.9 | |
| CTR | GS Rambura G | SS | S4 | 60 | 16.8 | 4.5 | 0.635 | 10.6 | 3.3 | 0.440 | 6.2 | 2.2 | 0.668 |
| | | | S6 | 34 | 19.4 | 4.0 | | 11.9 | 2.7 | | 7.6 | 1.9 | |
| | LNDV | SS (girls) | S4 | 28 | 12.5 | 4.7 | 0.137 | 7.4 | 3.3 | 0.210 | 5.1 | 2.1 | 0.243 |
| | | | S6 | 20 | 13.1 | 3.8 | | 7.5 | 2.2 | | 5.7 | 2.1 | |

[8] GS Kabuye joined lower secondary level Lesson Study in 2018 and thus no baseline data available for S1.

# 4. Other Findings

In addition to the quantitatively assessed changes discussed in the previous chapters, the Project observed various changes in the lessons.

- Teachers demonstrated improvement in teaching with Lesson Study (see 4.1 Case Studies)
- Many good practices which were not observed in the BLS were seen, while some challenges remained.

## 4.1 Case Studies

We picked two lessons (P5 math and S2 physics) from the treatment group as case studies to describe details of the Project intervention and improvements as outputs.

Table 4-1 is the case study of P5 math lesson at EP Buhande in the Rulindo district. Evidence of improvements as results of a Lesson Study is displayed after general information such as teacher profile, key advice from the Project and outlines of the lesson.

**Table 4-1: Case Study of EP Buhande P5 Math**

| | |
|---|---|
| School name | EP Buhande (Rulindo District) |
| Teacher | Ujeneza Seraphine |
| Teacher profile | The demo teahcer, Ms. Ujeneza Seraphine, has been involved in Mathematics Lesson Study group at Buhande primary school since the Project commenced in 2017. She is one of the biggest beneficiaries who received a lot of advice from the Project. |
| General issues on lessons | National exam pass rate for P6 is around 60% in this school. Main challenge of teachers here was to support "slow learners".<br>Teachers overall struggled to harmonize lesson objectives and learners' traits such as learning needs, understanding level, English skills and personalities. When teachers pay much attention on learning needs, teachers tend to fail achiving lesson objectives and vice versa. |
| Key advice from the Project | To overcome the above challenges the Project gave the following advice;<br>- Structure lesson content from simple example to complex problems to scaffold learners.<br>- Give sufficient time for individual work prior to groupwork to address learning needs of each student.<br>- Ask students for not only answers but also the process to reach answers so that the teacher can identify each student's way of thinking to guide. When students give wrong answers, the teacher should clarify the reasons for mistakes and errors.<br>- Guide students to copy any important information on notebooks as slow learners generally copy answers only.<br>- Give more opportunities for students to read and write in English. Even in teaching mathematics, it should be the time for most slow learners to learn English. At the same time, explain important mathematics concept both in English and Kinyarwanda in order to guide all student to achieve objectives. |
| Grade/Subject | P5 Mathematics |
| Unit | Solving problems involving measurements of lengths, capacity, and mass |
| Topic | Finding intervals on a closed line |
| Objective | Learners will be able to calculate the number of intervals on a closed line confidently in a given time. |

| | |
|---|---|
| Key Strategy | Use real objects (stones) and put on a school yard to clarify the relationships between number of objects and intervals.<br> |
| Evidence of improvement areas observed in the lesson | **Evidence 1: Devising teaching and learning aids**<br>The lesson was carefully structured from simple to complex problems. In order to have learners understand the lesson objective that the number of intervals is equal to the number of objects in a closed line (perimeter of a pond and a field, etc.), the teacher delivered the lesson by:<br>- Incorporating a hands-on activity (to measure perimeter and put stones at equal intervals<br>- Using a poster explaining a question with illustration<br>- Presenting materials sequentially from simple ones (the poster of a question with illustration) to complex (the poster of a questions in texts)<br>- Preparing enough teaching and learning aids for groups in advance such as tape measures, stones, worksheets and markers.<br>Besides, she showed careful consideration about learners by adjusting the position of a poster on the chalkboard to make sure that it is visible even for learners sitting in the back row, after walking around the class to check their activity.<br>Remaining issues<br>The teacher should have explained the procedure of the activity and ensured that learners understand it before letting them go outside, but they went out because they were not used to such a way. They were confused about what to do, and what and where to write in the worksheet. This resulted in their failure to present the results using the worksheet.<br><br>**Evidence 2: Confirmation of understanding of the important concept**<br>After substituting figures into formulas to find the number of intervals or the number of trees, he teacher repeatedly asked learners what the figures substituted such as perimeter, interval, the number of intervals and the number of trees. She had found that some learners did not understand the concept well while she was monitoring their calculation before. She used to explain all important concepts herself before, but she tried to wait patiently for learners to reach the answers by themselves.<br>Remaining issues<br>The teacher did not have learners explain or ask them for the reasons when they gave wrong answers in the lesson. Her colleague who observed the lesson advised in the post-lesson reflection conference that she should have asked learners for the reason in such a situation. To make the most of learners' wrong answers for deepening their understanding is part of key advice which the Project has highlighted.<br><br>**Evidence 3: Consideration of learners' English level and flexible code switching**<br>The following actions by the teacher indicate her consideration of learners' English level:<br>- She asked learners for the date and the lesson title, and wrote them on the chalkboard, while pronouncing them at the beginning of the lesson.<br>- Subsequently, she put on the chalkboard a manila paper with the following review questions were written:<br>Intervals on an open line: A road is 2 km long. Trees were planted 2m apart alongside of the road. An interval of 2m was left at an end without a tree due to an existing shop. How many trees were planted along the road?<br>After reading out the question, she had them solve in pairs. She used to jump into groupwork before. |

| | |
|---|---|
| | - She let learners read aloud the questions before they solve them on the chalkboard. She seemed to incorporate the Project's advice that teachers should consider improving learners' English level even in mathematics lessons.<br>- She used gestures to explain open or closed lines well, which had not been seen before. She used code switching flexibly both in mass teaching and in monitoring individual learners' work, according to their reaction. She used to regard code switching as inappropriate before.<br><u>Remaining issues</u><br>The level of English in exercise questions is by far high compared to the learners' level. It would have been much better if the teacher had read out questions together with learners, pointing from one word to another on the chalkboard, and had confirmed their understanding of the questions and the meaning of some important words before moving to individual work. It is recommended that, when supplementing in Kinyarwanda, she should also rephrase it in plain English so that they understand the correspondence between the two languages. |
| Overall Comments | On the day of the lesson observation, learners were so nervous that some of them could not fully concentrate on the lesson because there were a lot of visitors including video-shooting staff. Cameras and microphones often disturbed classroom communication. In spite of such difficult conditions, the teacher paid much attetion on learners' learnring and used vairous effecive techniques to support them according to their learning needs.<br>If the Lesson Study group had studied the content more deeply during Lesson Study, the lesson would have been delivered differently. The learning objective of the lesson is to understand the relationship between the number of intervals and the number of trees on a closed line, with attention to the difference between an open line in the previous lesson. In this lesson, the teacher was not able to let learners notice the relationship because of extra task of finding the perimeter of a square or a rectangle, which was guided in the textbook. When discussing what would have been appropriate during the post-lesson reflection conference, the demonstrator pointed out that finding the perimeter of shapes had become the objective against the original purpose. This can be regarded as a important statement considering the lesson objective. Indeed, giving the length of perimeter of a round pond might have worked better in this lesson. It is desirable that the Lesson Study group study contents, taking into consideration what they should focus on and what exercise questions would appropriate to achieve lesson objectives, not just following the content in the textbook. |

Table 4-2 is the case study of S2 physics lesson at GS Mukarange Catholique in Kayonza district. The information is structured in the same manner as above.

**Table 4-2: Case Study of GS Mukarange Catholique S2 Physics**

| | |
|---|---|
| School name | GS Mukarange Catholique (Kayonza District) |
| Teacher | Uwineza Emmanuel |
| Teacher profile | This school joined model schools in 2018 and conducted Lesson Study in primary level. Secondary level started Lesson Study in 2019. On the day of the survey, the demo teacher did not prepare the lesson plan and did it after the lesson. He had participated in the Lesson Study though this lesson was not the one that the Project supported. |
| General issues on lessons | National exam pass rate for S3 is around 75% in this school. Main challenge of teachers was to manage large classes. Teachers have been eager to develop their teaching skils through Lesson Study. |
| Key advice from the Project | The learning objectives in science lessons are to get learners interested in natural phenomena around them, have them think why and solve it through scientific experiments and critical thinking according to their developmental stage. The Project gave the following advice; |

| | |
|---|---|
| | - Plan experiments using locally available materials as much as possible to develop skills and attitudes required for experiments and equip them with scientific thinking process (assumption, experiment/observation, recording, consideration and conclusion) through experience.<br>- Encourage them to discover important points and explain them, not do it as teacher.<br>Regardless of the repeated advice, the Project had never observed lessons where learners conduct experiments at lower secondary level because of insufficiency of teaching and learning materials and difficulty in letting many learners conduct experiments in a crowded classroom, not in a laboratory, which the school did not have. |
| Grade/Subject | S2 Physics |
| Unit | Archimedes' principle and atmospheric pressure |
| Topic | Principle of Archimedes |
| Objective | After the lesson, each learner should be able to verify and explain Archimedes' principle very well |
| Key Strategy | Encourage learners to discover Archimedes' principle through an experiment.<br> |
| Evidence of improvement areas observed in the lesson | **<u>Evidence 1: Experiment in groups</u>**<br>The lesson objective was to let learners confirm and understand the Archimedes' principle that a body immersed in a fluid is subjected to an upwards force equal to the weight of the displaced fluid. The teacher distributed a spring balance, a weight, a beaker, water to each group and put a poster of experimental procedures on the chalkboard. Then they moved to the experiment in groups. The teacher had learners record the results of observation as to gravity of the weight, its gravitiy under the water, difference of the gravity and how much volume the water increased when the weight was put under water.<br>It should be highliy appreciated that the teacher tried to get learners to understand the principle through an experiment, considering that teachers generally tend to just teach definition and formula in textbooks so that learners memolize them.<br><u>Remaining issues</u><br>Although learners were interested in the experiment, it took too much time and there were experimental errors among groups, because not all learners fully understood the experimental procedures and they were not used to experiments in terms of how to read the scale and how to use the spring balance. Given the 40-minute lesson for an experiment, more time should have been allocated without the review of the previous lesson. It is desirable to give two periods (80 minutes) for an experiment. Scientific experimental process includes assumption, experiment/observation, recording, consideration and conclusion. Learners should make it a habit to record results of observation individually, even in a group experiment. To do so, a worksheet should be carefully considered so that they can copy it on their notebook and write down on it.<br><br>**<u>Evidence 2: Comparison of results by groups on the chalkboard</u>**<br>The teacher had every group record results of the experiment on a piece of paper and write on the chalkboard. He added explanation, comparing the results of the groups.<br><u>Remaining issues</u><br>Due to running short of time, the teacher rushed into conclution that a body immersed in a fluid |

| | |
|---|---|
| | is subjected to an upwards force equal to the weight of the displaced fluid by himself, though it should have been discovered by learners. Besides, the volume of the weight equaled to 30ml, but the most spring balances indicated 0.2N. It would be unreasonable to conclude that the Alchimedes' principle was proved from the two figures. Falure and errors are inevitable in experiments, as a mismatch between the buoyancy and the volume in this expertiment. The teacher could have let learners think the reason of the mismatch, apart from rushing into conclution. |
| Overall Comments | Pupils' English level is likely to prevent them from explaining their ideas in primary education. In spite of improvement as they go up to next grades, they are not given opportunities to think and explain by themselves, contrary to the Project's advice. Science lessons can more easily lead to deeper learning because there can be many opportunities for them to think, such as to describe assumption based on their experience and explain what can be led from the results of the experiment.<br>Ideally, more experiments could be conducted in the future, but teachers should experience them ahead of learners. It is not easy to include experiments in every lesson and there are topics where experiments are not suitable.<br>They may borrow ideas from videos of experiments on Youtube. They can increase ideas of experiments and share them as common assets among colleagues. If teachers can collaboratively develop a collection of scientific experiments including templates of worksheets, experiments can become familiar for themselves as well. |

## 4.2 Good Practices and Challenges

During the ELS, the Project found good points and challenges that are common in the lessons. Good points indicate teachers' efforts in improving teaching, which can contribute to improved learning, but some challenges observed in BLS remained.

Table 4-3 lists good teaching practices at schools where we observed, organized according to the flow of lessons.

**Table 4-3: Improvements in Teaching**

| Stage | Improvements |
|---|---|
| 1) Review of the previous lesson | The teacher:<br>- reviewed what learners studied in the previous lessons, and explained the relationship between them and the current lesson (EP Buhande, P5 SET; GS Kabuye, S2 Biology; GS Mukarange, S2 Biology; GS Mukarange, S5 Math)<br>- explained the relationship between the current lesson and what learners learned in earlier grades (GS St Aloys R, S3 Biology; GS St Aloys R, S4 Chemistry)<br>- let learners have time to look at their notebooks to reflect the previous lesson, without instructing it (GS APAGIE, S5 Biology)<br>- asked learners not only to give terms that they studied before, but also to explain their definitions (GS Kabuye, P5 SET) |
| 2) Main learning activity of the lesson | The teacher:<br>- led learners to the main theme of the lesson step by step through logical guided instruction, not through one-way instruction or lecturing (GS APAGIE, S2 Math)<br><u>In group work</u><br>The teacher:<br>- chose an appropriate activity for group work, which can deepen individual learning through group discussion (Buhande, P5 SET; St Aloys R, S3 Biology)<br>- gave a question or activity of a new topic which can be solved by learners by employing what they learned before (EP Buhande, P5 SET; GS St Aloys R, S2 Math; GS St Aloys R, S3 Biology; GS NDA Rwaza, S5 Math)<br>- asked for the reason why the learner reach the answer, monitoring individual |

| Stage | Improvements |
|---|---|
| | learners' work (GS Mukarange P5 SET)<br>- gave additional support for slow learners or groups with slow learners, walking around the class (GS NDA Rwaza, S5 Math)<br>- had all group members (not only one representative) write their findings in their notebooks (GS St Aloys R, S2 Biology)<br>- gave different questions to different groups, and had group members explain their answers to other group' members (GS Kabuye, P5 Math)<br>- had learners exchange their notebooks and mark answers each other (GS Kabuye, P5 Math; GS Gihogwe, P5 Math)<br><u>In science experiments</u><br>The teacher:<br>- moved to experiments after clarifying the its objective and methods (GS Saint Aloy R, S3 Biology; GS St Aloys R, S4 Chemistry)<br>- had all group learners write their findings from the experiment in their notebook (GS St Aloys R, S3 Biology; GS St Aloys R, S4 Chemistry)<br>- made sure that learners would find something new from the experiment (the teacher did not explain the results before the experiment) (GS Gihogwe, S2 Biology; GS Mukarange, S2 Physics, GS St Aloys R, S3 Biology; Gs St Aloys R, S4 Chemistry) |
| 3) Presentation of findings/answers | The teacher:<br>- purposefully pointed a learner who did not raise a hand (LNDV, S2 Math)<br>- assisted learners who had difficulty in explaining in English so that they can construct sentences (EP Buhande, P5 SET)<br>- facilitated all learners' learning by rephrasing their presentations, adding explanation when necessary, asking for the reasons why they thought so, and asking other learners to correct wrong answers (EP Buhande, P5 SET; GS Mukarange, P5 SET; GS Kabuye, P5 SET; GS Mukarange, S2 Biology; GS Kabuye, S2 Biology; GS Gihogwe, S2 Math; LNDV, S2 Physics; GS St Aloys R, S3 Biology; GS APAGIE, S5 Math; GS Mukarange, S5 Math; LNDV, S5 Math) |
| 4) Conclusion/ summary | The teacher:<br>- summarized the lesson by quoting what learners spoke (GS Mukarange, P5 SET)<br>had learners take notes of important content (GS Mukarange, P5 SET; GS APAGIE, S2 Biology; GS St Aloys R, S3 Biology)<br>- linked mathematical or scientific content with real life (GS NDA Rwaza, S5 Math) |
| 5) Assessment | The teacher:<br>- gave applied assessment questions requiring higher order thinking based on what learners learned, as well as basic assessment questions (GS Mukarange, S2 Biology)<br>- had individual learners solve questions and collected the piece of paper to mark later (GS NDA Rwaza, S2 Biology; GS St Aloys R, S3 Biology) |

## 4.3 Remaining Challenges

Remaining challenges are listed anonymously according to the flow of lessons in Table 4-4. These should be addressed in future training programs.

**Table 4-4: Remaining Challenges in Teaching**

| Phase | Challenges |
|---|---|
| 1) Review of the previous lesson | The teacher:<br>- reviewed what learners studied in the previous lessons just for formality and did not explain or imply the links between them and the current lesson |

| Phase | Challenges |
|---|---|
| 2) Main learning activity of the lesson | The main learning activity was done by group work in almost all lessons, regardless of subjects and grades. Teachers are advised to use different methods depending on the advantages, such as individual work, solve an example question as a whole class with the teacher's guided instruction, as well as group work. Below is current status of group work and areas for improvement.<br><u>Activity in group work</u><br>- Activities were not well organized because they mixed what learners know from experience, what they acquired as knowledge, and what they have to examine scientifically.<br>- Many activities did not go beyond finding the definition or explanation of a term from the textbooks. Individual work can enhance learning more than group work in such a case if it does not entail further discussion.<br>- Besides, it is better to facilitate learning a new topic by using what learners studied before in math lessons or developing scientific thinking through experiments and observations in science lessons, rather than to have them find from textbooks. In this way, the teacher can lead to discovery of a new thing at the end. Such an activity can be done by group work.<br><u>Typical group work in math lessons</u><br>- Calculation excises as main activities were done by group work, but they should have been done as individual work to develop individual learners' thinking and skills. If the activities in groups were for "communication", which was prescribed in the curriculum, the teacher could allocate time to communicate with others not in calculation exercises but in finding a new formula or marking answers each other. This can deepen individual learners' thinking.<br><u>The way of conducting group work</u><br>- Group work started without proper instruction. In spite of a new topic, groups were told to work on the experiments/observations or math problems, which caused their confusion. There were many cases where the teacher ended up explaining methods group by group, as learners asked many questions because of little prior instruction. Lessons cannot be effective unless clear objectives and methods have been clarified in advance, especially in experiments.<br>- Learners' work was not carefully monitored though the teacher walked around in the class.<br><u>The way of learners' taking notes</u><br>- Only representatives of groups wrote down answers on papers, but all learners should have taken notes of answers and findings on their notebooks not only in calculation exercises but also in experiments. |
| 3) Presentation of findings/answers | The teacher:<br>- explained unilaterally without quoting or referring to the answers of groups presented on the chalkboard<br>- repeated the same questions such as "do you understand?" meaninglessly<br>- uttered the beginning part of an answer to let learners say the following part<br>- did not give the time for asking the teacher questions<br>- had groups present their answers always in the same order, though it should have been carefully planned by monitoring group work before, in order to stimulate learning |
| 4) Conclusion/ summary | The teacher:<br>- lectured and did not have time for interaction<br>- did not give learners time to take notes |
| 5) Assessment | The teacher:<br>- gave assessment questions requiring recalling of a definition or a formula only<br>- gave assessment questions as group work for just confirming learners' understanding |

# Part II

## CPD at school, Sector and District

# 5. CPD at School

The CPD activities at the school level are analyzed in terms of the schools' arrangement, effectiveness, and teacher participation.

- Schools regularly organized CPD activities, once a term or more and almost all teachers attended them.
- Availability of resource materials has improved, but is not yet sufficient.
- Lesson Study embraces features of effective professional development.
- Lesson Study and the degree of participation in school-based CPD had a positive correlation with teachers' perception about school circumstances
- Teachers' self-evaluation on their understanding of CBC philosophy was high.

This chapter also drew on responses of a similar survey on a national scale to generalize challenges recognized by teachers and education officers.

## 5.1 Overview

Concerning school-based CPD, the Project organized questionnaires and interviews with stakeholders, which are teachers themselves and HTs as school leaders at the target schools. Additionally, the analysis of these surveys is supplemented by analyzing a large-sample survey questionnaire conducted for CBC needs assessment in February 2019 which targeted teachers, HTs and education officers.

For evaluation of CPD at the school level, a model of effective professional development proposed by Darling-Hammond, Hyler and Gardner (2017) is referred to below. They identified seven characteristics of effective professional development as follows:

1. Is content focused
2. Incorporates active learning utilizing adult learning theory
3. Supports collaboration, typically in job-embedded contexts
4. Uses models and modeling of effective practice
5. Provides coaching and expert support
6. Offers opportunities for feedback and reflection
7. Is of sustained duration

The status of CPD taking place at schools is assessed according to these elements, using narrative data from questionnaires and interviews with teachers and HTs.

## 5.2 Implementation of School-based CPD

### 5.2.1 CPD Setting at Schools

As a result of the concerted effort by the education sector in promoting CPD, all target schools were aware of CPD. According to the questionnaire for HTs, nine out of eleven schools allocated dedicated CPD time in teachers' timetable and the number of periods for CPD per week is either one or two. It should be noted that the understanding of CPD time is different between the HT and teachers, or among teachers. Even though a HT answered that there was CPD time in the timetable, some teachers answered that they did not have CPD time in their timetable. However, it can be said that CPD is conducted regularly at all schools, once a term or more and teachers participate in it.

The teachers' work seems overloaded. A third of teachers (most of whom taught primary level) have more than 40 periods to teach per week. In this situation, securing time when colleagues gather for CPD activities would be difficult. This was evident in the interviews with teachers too; in more than half of the schools, teachers recognized that the 'time' was a challenge. Interestingly,

however, only a few HTs mentioned this problem. This shows a gap between teachers and school leaders.

### 5.2.2 Resource Materials

Resource materials are important references used during CPD at the school level. The questionnaire for teachers asked about the materials that they referred to when preparing lessons. Figure 5-1 shows the rate of teachers who referred to each document by category of school, regardless of intervention (treatment and control). Almost all teachers used CBC textbooks authorized by REB. Considering that the rate was less than 40% as of BLS in March 2017[9], availability of textbooks and teachers' readiness to use textbook have improved. The curriculum and syllabus were also referred to by many teachers, if not all. The problem is that it does not necessarily mean that teachers have been given enough materials. The questionnaire for HTs revealed that these materials were available for some teachers or subjects, or even for a few teachers or subjects, which means that teachers share the resources as shown in Figure 5-2.
When it comes to teachers' use of reference materials (softcopy) and information on internet, there is a gap between secondary school teachers and primary school teachers (Figure 5-1). Many primary school teachers did not access these materials, which may reflect low accessibility to computers and internet, and/or teachers' low IT skills.

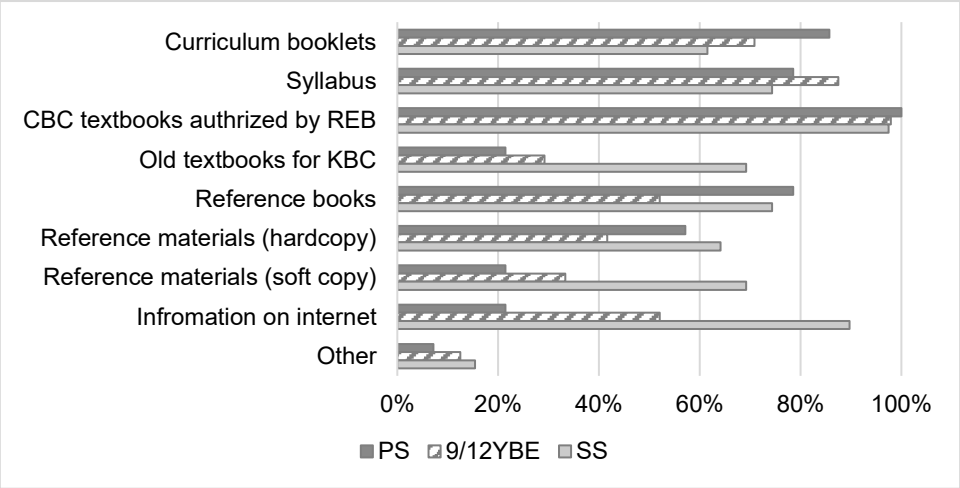



**Figure 5-1: Resource Materials Used by Teachers**

[9] The low rate of textbook use in 2017 may be partly because CBC had not been introduced in P3, P6, S3 and S6 at that time.

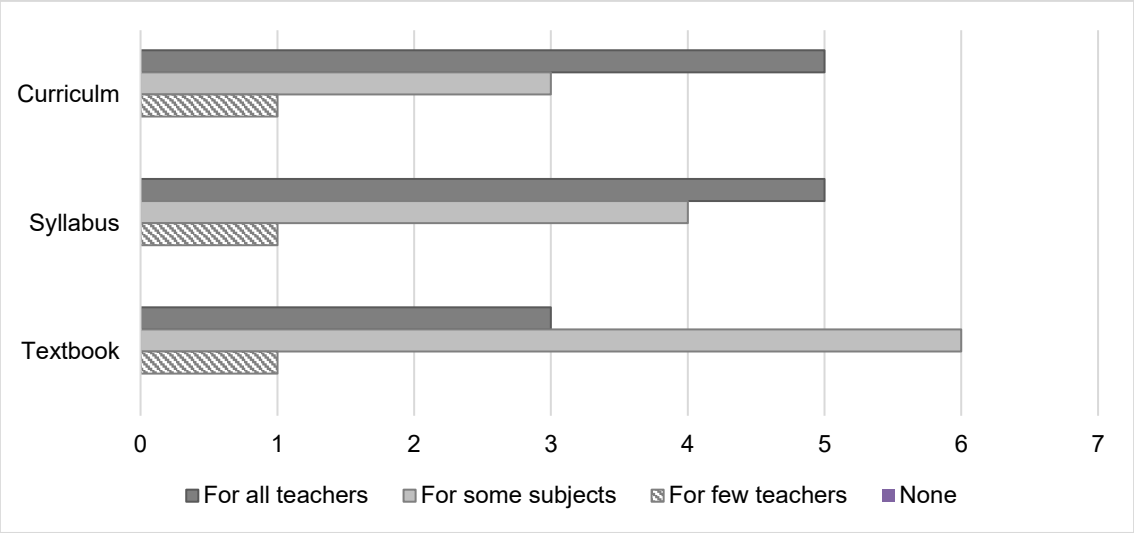



**Figure 5-2: Available Resources at School Level**

### 5.2.3 Effectiveness of CPD

#### (1) Evaluation of Effectiveness of School-based CPD

Darling-Hammond et al. (2017) proposed seven features of effective teacher professional development from review of studies on professional development demonstrating a positive relationship between teacher professional development, teachers' practices and learners' performances. Lesson Study has all these features as explained in Table 5-1.

**Table 5-1: Seven Effective Features of Teacher Professional Development**

| Feature | Description | Interpretation in Lesson Study |
|---|---|---|
| 1: Is content focused | Focuses on teaching strategies associated with specific curriculum content within teachers' classroom contexts. | Picks up a specific lesson and develops a lesson plan |
| 2: Incorporates active learning | Engages teachers directly in designing and trying out teaching strategies, providing them an opportunity to engage in the same style of learning they are designing for their students. | Demonstrates the lesson in micro-teaching in front of other teachers to confirm the practicability of the developed lesson plan. |
| 3: Supports collaboration | Creates space for teachers to share ideas and collaborate in their learning, often in job-embedded contexts | Encourages teachers to discuss and collaborate to develop a lesson together. |
| 4: Uses models of effective practice | Provides teachers with a clear vision of what best practices look like. | Is a study to develop a model lesson. |
| 5: Provides coaching and expert support | Shares expertise about content and evidence-based practices, focused directly on teachers' individual needs. | Incorporates evidence-based practices given from experts or literature. |
| 6: Offers feedback and reflection | Provides built-in time for teachers to think about, receive input on, and make changes to their practice by facilitating reflection and soliciting feedback | Ensures the time for reflection and revision of the lesson plan both after micro teaching and at the end of the program |
| 7: Is of sustained duration | Provides teachers with adequate time to learn, practice, implement, and reflect upon new strategies that facilitate changes in their practice. | Is conducted in steps, normally taking a few months to a year to complete. |

Source: Created by the Project by referring to Darling-Hammond et al. (2017). Effective Teacher Professional Development, pp. v-vi

As shown in Table 5-2, we examined CPD activities in the schools from the perspective of these features, referring to information provided by each school. For the treatment group, Lesson Study is evaluated as a CPD activity. Due to limited information from questionnaires and interviews from the control group, the CPD activities are evaluated on whether they have the features or not. The CPD activities in the control group did not have all the features.

**Table 5-2: Evaluation of CPD from Effectiveness Perspective**

| Category | School | Feature | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| TRT | EP Buhande, GS Kabuye, GS Mukarange, GS APAGIE, GS St Aloys R, GS NDA Rwaza | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CTR | EP Bukinanyana | ✓ | ✓ | ✓ | | | | ✓ |
| | GS Gihogwe | ✓ | | ✓ | ✓ | ✓ | | ✓ |
| | GS Bubazi | ✓ | ✓ | ✓ | | | | ✓ |
| | LNDV | ✓ | | ✓ | | | | ✓ |
| | GS Rambura G | ✓ | ✓ | ✓ | | | | ✓ |

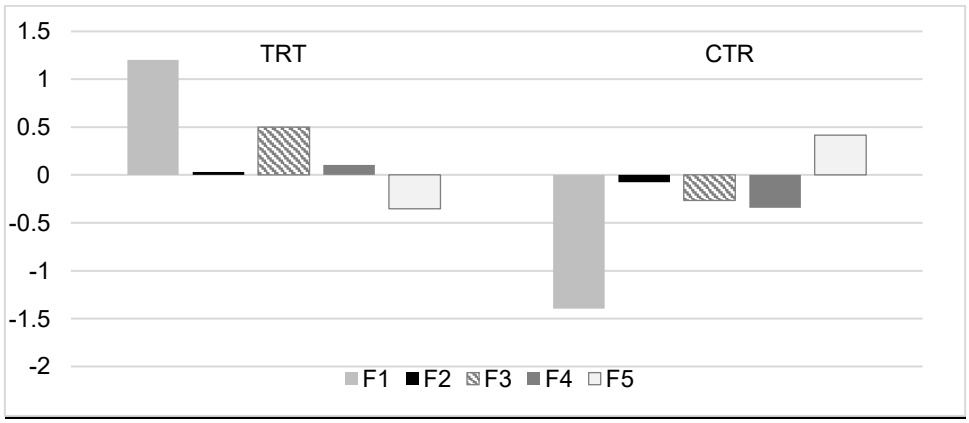
Note: It does not necessarily mean that CPD activities in CTR do not actually have the features, even if such information was not found from the questionnaire and interviews.

### (2) Relationship Between CPD and Teachers' Perception About School Circumstances

The BLS report did an exploratory factor analysis to investigate characteristics of teachers who did not attend trainings. It presented five factors and highlighted the importance of supporting an environment that encourages teacher participation in CPD.

ELS also conducted an exploratory analysis. Figure 5-3 shows the factor scores by intervention (treatment and control), using teachers' responses to questions related to school circumstances. The treatment group's scores for factor 1 (shared school vision) and 3 (collegiality for lesson improvement) were positive in contrast to the control group's scores, while the score for factor 5 (resource persons) was negative. Lesson Study may have contributed in transforming school visions into clear missions about teaching practices. Undoubtedly, it also promoted collegiality through collaboration. This result verifies the effectiveness of Lesson Study.

Regarding factor 5, however, it implies that SBMs and SSLs had less of a chance to play a leading role in CPD because the project members served as resource persons in Lesson Study. This should be carefully considered in future CPD programs.




Note: Factor 1: shared school vision, Factor 2: participatory school management, Factor 3: collegiality for lesson improvement, Factor 4: evidence-based school planning, and Factor 5: resource persons

**Figure 5-3: Factor Scores by Type of Schools**

### 5.2.4 Influence of School Management

School leadership definitely plays a key role in creating a supporting environment for CPD. According to the responses in the questionnaire and interview with HTs, "support" can be classified into technical, administrative and financial support. Technical support for example, is to develop training materials and to give advice or feedback to teachers. Administrative support is to facilitate CPD activities such as allocation of CPD time in timetables, assignment of resource persons such as SBMs, and monitoring of teachers' participation. Financial support is to provide necessary expenses for activities including teachers' transportation expenses on the weekends, and training material cost.

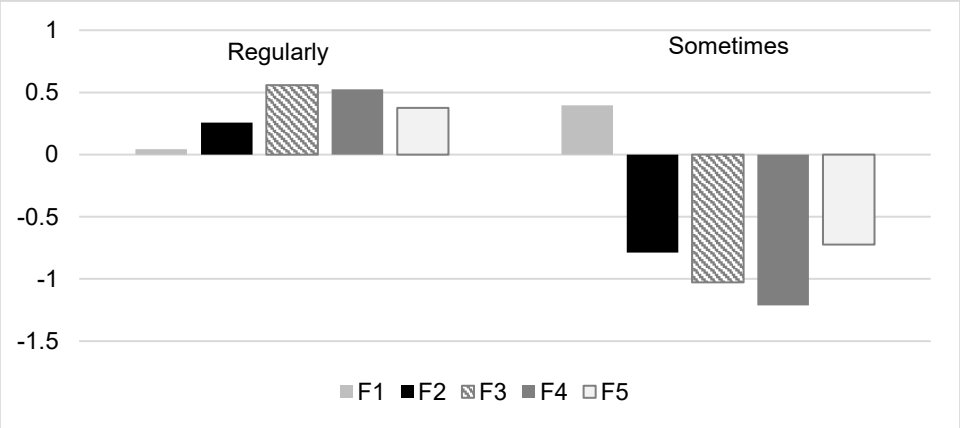
In the questionnaire and interview, all school leaders mentioned these three types of support more or less. As to technical support, some school leaders observed teachers' lessons to give feedback and to identify CPD needs. For example, in GS St Aloys R, the DOS identified CPD is needed in lesson planning. Teachers were not able to differentiate cross-cutting issues and generic competencies. Therefore, he developed training material on his own and planned training. After the training, teachers were grouped by departments and were requested to develop a lesson plan. Developed lesson plans were presented and discussed about on another occasion for CPD. The DOS of GS Gihogwe conducted lesson observation together with the SBM and planned CPD activities. Administrative support is the type of support which most school leaders focused on. The HT of EP Buhande allocated two periods on Thursday afternoon for CPD activities. At EP Bukinanyana, the HT provided time for CPD, while pupils cleaned the school. The DOS of GS APAGIE monitored CPD activities. Financial support was basically given in non-monetary forms. Lunch was provided at GS Mukarange and GS St Aloys R when CPD was conducted on weekends. Provision of necessary materials were mentioned by many school leaders including EP Buhande, GS Kabuye, GS APAGIE, GS St Aloys R and LNDV. The HT of GS NDA Rwaza emphasized the importance of enhancing teachers' intrinsic motivation, not extrinsic motivation such as monetary incentives.

### 5.2.5 Teachers' Participation in School-based CPD

The Education Sector Strategic Plan (ESSP) 2018/19- 2023/24 sets out to strengthen teacher CPD across all levels of education as one of its nine priorities, and the improvement of teachers' competencies to deliver the new curriculum appropriately as one of the outcomes under this priority. Participation in CPD is regarded as a teachers' duty.

Among valid responses in the questionnaire for teachers at the target schools, all teachers attended CPD activities at school level except for two teachers who answered CPD was never conducted. In other words, 98% of teachers attended CPD. More than 70% of them attended regularly. This is significant progress since BLS in 2017, where 25% of teachers did not attend school-based CPD at all.

Furthermore, the degree of participation seems to be correlated with teachers' perception about school circumstances. An exploratory factor analysis of the questionnaire for teachers found that those who regularly attended CPD tend to have more positive views about school circumstances such as school management, collegiality, school planning and resource persons. However, the factor of school vision negatively affected the degree of participation. This reason should be further investigated.




Note: Factor 1: shared school vision, Factor 2: participatory school management, Factor 3: collegiality for lesson improvement, Factor 4: evidence-based school planning, and Factor 5: resource persons

**Figure 5-4: Factor Scores by Degree of Participation in CPD**

### 5.2.6 Teachers' Self-evaluation on CBC

As CPD activities have been conducted at the school level and lessons have been transforming in a good direction, teachers' self-evaluation on CBC is also deemed to have improved. Guskey (2002) proposed a model of teacher change, which states that the teachers' practice in the classroom following professional development brings about positive learning outcomes, which eventually leads to change in the teachers' belief and attitude.

The analysis of valid responses of the ELS questionnaire for teachers found that 97.9% of them agreed or strongly agreed that they understand the philosophy of CBC. Similarly, 97.9% agreed or strongly agreed that they are confident in conducting CBC lessons. As for the improvement in the understanding of CBC since its introduction, the rate was 89.6%. This positive change in teachers' understanding was acknowledged by almost all HTs (DOS). They answered that teachers' practice has changed since the introduction of CBC "moderately" or "very much", except for one DOS who did not answer the question. The changes reported during the interview with HTs were about teaching style. Teachers used to deliver lessons in lecture style, where the teacher speaks more than learners do. Nowadays, they try to engage learners by preparing lesson plans well, and using teaching aids.

## 5.3 Findings and Lessons from a Similar Survey

A nationwide, sampling online survey was administered by REB in cooperation with the Project and British Council in February 2019. The online survey was designed to identify issues and challenges with CBC as well as CPD implementation. Its targets were teachers, HTs, SEOs and DDEs/DEOs. The sample size is shown in Table 5-3. The overall coverage was 6.4% of total population.

**Table 5-3: Sample Size of Nationwide Survey**

| Category | Number of respondents | Coverage against all population |
|---|---|---|
| Teachers | 4,178 | 6.0% |
| HTs | 497 | 11.2% |
| SEOs | 87 | 20.9% |
| DDEs/DEOs | 22 | 24.4% |
| Total | 4,784 | 6.4% |

Note: "Coverage against all population" for teachers and head teachers are based on number of teachers (69,602) and head teachers (4,412) in 2017 Education Statistics (Ministry of Education, 2018)

The objectives and target group were quite similar to our ELS. Hence it should be fruitful to review the data again and analyze it independently in order to consolidate our understanding about the issues of CPD, though it is not a part of the ELS. So therefore, we focused much attention on analyzing narrative (open-ended) answers which were not intensively reviewed in the original analysis because of their difficult-to-aggregate nature. We applied a "text mining" method which uses a software called KH Coder[10].

### 5.3.1 Challenges of Teachers' Attendance to CPD

In the nationwide survey, primary and secondary teachers who never attended school-based CPD this year (*N*=414) described the reasons. Among them, 389 valid responses were analyzed. 39 morphemes with high frequency (more than four appearances) were used to draw a co-occurrence network diagram (Figure 5-5). Morphemes with higher frequencies are depicted by a bigger circle. Words were automatically grouped and separated by color. Eight groups were extracted which can be named: 1) Time/timetable, trainers, 2) head teacher/school leadership, 3) new teacher, 4) awareness 1 (no knowledge), 5) awareness 2 (first time to hear), 6) not planned, 7) organized or introduced, and 8) attended last year.

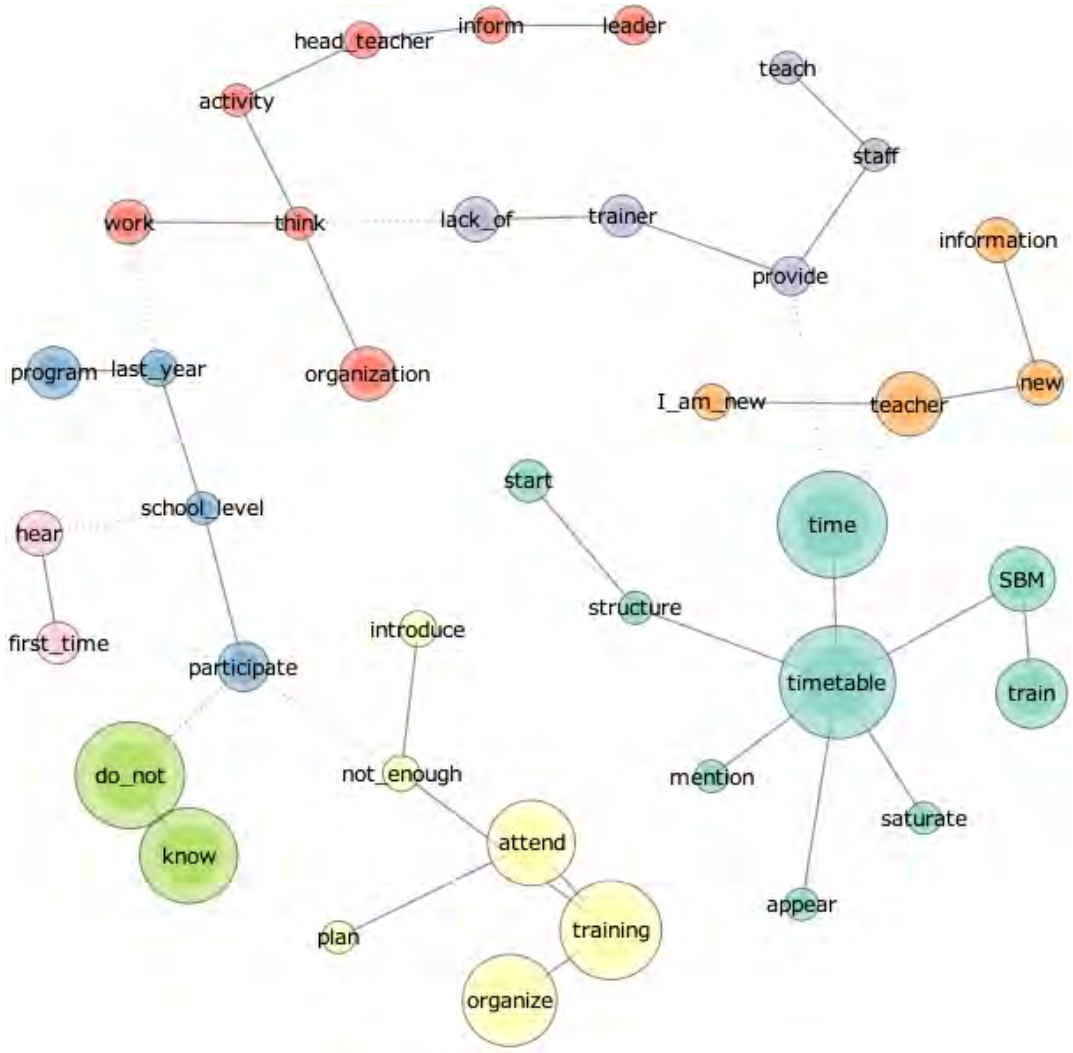



**Figure 5-5: Text Mining of Challenges of CPD from Teacher' Point of View**

[10] Text mining by KH Coder identifies "morphemes" (the smallest meaningful unit of language) by their frequency of appearance and visualizes the intensity of their relationship by classifying them into groups ("communities").

### 5.3.2 Challenges of Teachers' CPD Observed by Education Officers

After the initial screening, 120 valid responses from SEOs, DDEs and DEOs were used for this analysis. 30 morphemes with high frequency (more than four appearance) were used to draw co-occurrence network diagrams. Morphemes with higher frequencies are indicated by a bigger circle. Words were automatically grouped and separated by color. Eight groups were extracted which can be named: 1) Time and budget, 2) financial means, 3) head teacher, 4) resource persons' timetable, 5) difficulties of monitoring school-based activity, 6) lack of material and facility, 7) transport fee, and 8) availability of committee members.

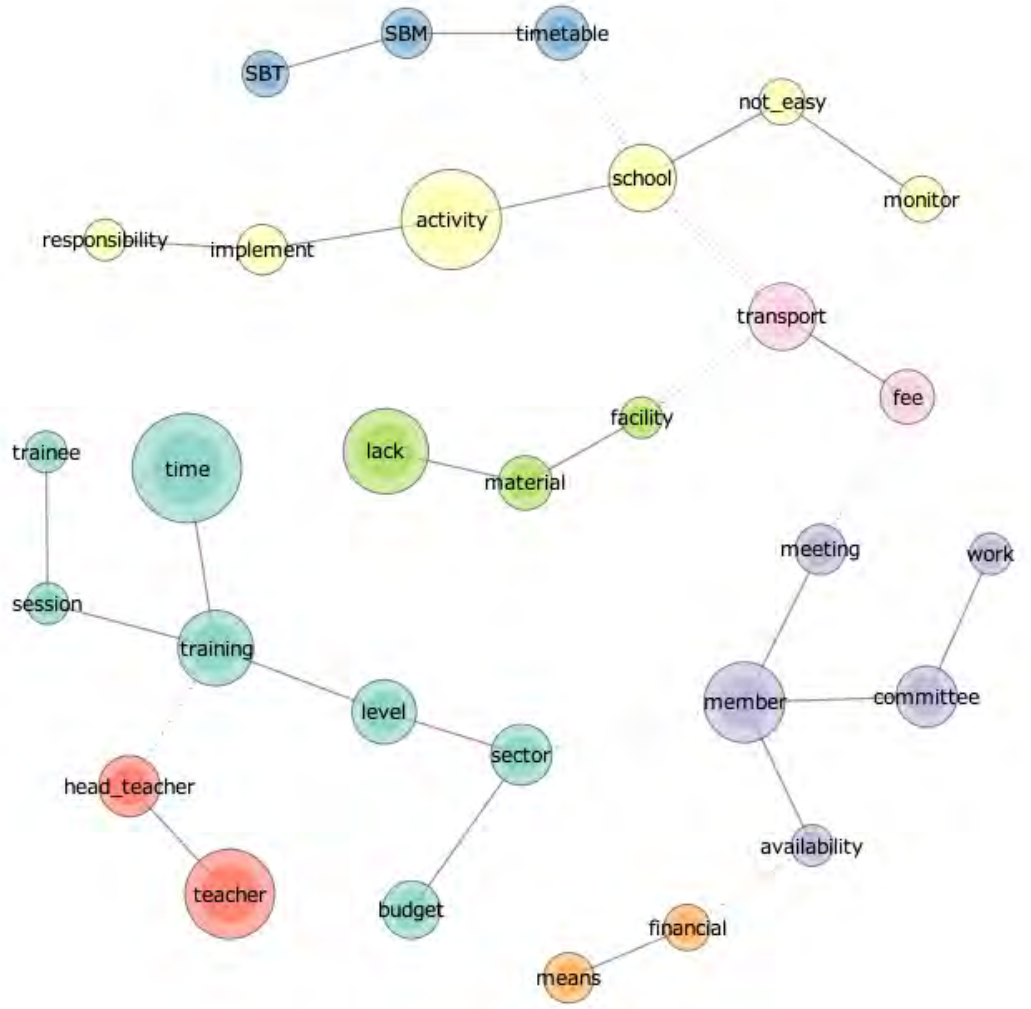



**Figure 5-6: Text Mining of Challenges of CPD from Education Officers' Point of View**

### 5.3.3 Commonly Recognized Challenges in CPD

The text mining revealed that there were challenges commonly recognized by teachers and education officers. They are *lack of time*, *unavailability and insufficient capacity of resource persons*, and *unsupportive school leadership*. Indeed, these are important factors for effective CPD too, as discussed earlier. Challenges of budget and lack of monitoring systems were raised by the education officers only. Budget may not be an obstacle for CPD as long as CPD takes place at the school level with minimal costs.

# 6. Potential for Nation-wide CPD mechanism

SEOs of the sectors where the treatment schools are located are willing to expand Lesson Study to other schools. DCCs and SCCs have had challenges including commitment of stakeholders, budget and time. Now that REB officially requested districts to include CPD in districts' performance contracts, DCCs and SCCs should be activated. For expansion of Lesson Study, DCCs and SCCs should ensure that schools allocate sufficient time for CPD in teachers timetables. In addition, CPD monitoring mechanisms from school to national levels must be strengthened.

## 6.1 Overview

Lesson Study was continuously conducted at six schools and there has been an impact in teaching and learning as discussed before. It is important to disseminate lessons learned or scale up the model to other schools. DCC and SCCs are expected to play a key role in sharing such information or knowledge among neighboring schools. Thus, we investigated the possibility of Lesson Study expansion by reviewing functionality of DCC/SCCs and analyzing their internal and external environments.

## 6.2 Status and Activity of DCCs and SCCs

The interview with DDEs revealed that DCCs did not meet so often, although the Project confirmed that DCCs had been established in the districts. SCCs also existed but the status varied from one sector to another. In some sectors, SCCs have become a platform where members plan, conduct and monitor CPD activities at the sector or school level. In other sectors, SEOs have coordinated similar tasks independently of SCCs, because of difficulty in gathering all members at one time. These days, Mentor trainers were tasked with conducting training for SBMs at each sector on a monthly basis, using CPD manuals. Many sectors have conducted this CPD activity successfully. SCCs are more likely to work well than DCCs, given the smaller coverage of schools and geographical areas. On the other hand, both DCCs and SCCs were struggling to raise awareness of key persons such as vice mayors and executive secretaries, arrange time for meetings, and secure budget for operation.

## 6.3 Potential of Lesson Study Expansion

### 6.3.1 Education Officer's View about Expansion of Lesson Study

Out of five SEOs from the sectors where the treatment schools are located, and who we could visit, four were familiar with Lesson Study, but one (SEO of Kigabiro), was not aware of it. This may be attributed to the degree of support provided by the Project. The Project team has supported the model schools in the four sectors more intensively than St Aloys R in the Kigabiro sector. They had chance to visit another model school to observe and learn from a research lesson with model school teachers. However, GS St Aloys R was given less support because the school was mature enough to conduct Lesson Study by teachers themselves.

The four SEOs took Lesson Study as a beneficial CPD program and pointed to improvement of teachers' skills in lesson plan development and assessment, and positive change in teachers' confidence, for example.

They were willing to expand this experience to other schools in their sector. SEO Mukarange has already taken action by including it in the sector performance contracts (Imihigo). Teachers from GS APAGIE Musha in Musha sector visited other schools to train teachers on various areas, not just Lesson Study.

As for possible strategies to share with other schools, they mentioned the following:

- Introducing Lesson Study to HTs
- Introducing Lesson Study in a sector level CPD activity
- Conducting an Open Day to demonstrate an outcome of Lesson Study
- Including Lesson Study in the sector action plan or performance contract (Imihigo)

The key for SCCs to make them happen seems to depend on whether they can link their work with the existing resources (training materials, resource persons, allocated budget, etc.).

### 6.3.2 SWOT Analysis

Basically, the SEOs appreciated the impact of Lesson Study, but there are challenges that may hinder the expansion of Lesson Study through DCCs and SCCs. In order to understand the current situation more comprehensively, the Project conducted a SWOT analysis for Lesson Study expansion in those sectors as shown in Table 6-1. While there are strengths and opportunities for expansion, the weaknesses and threats are serious problems in Lesson Study. Some weaknesses such as overloaded timetables and no follow-up from SCC are common regardless of type of CPD.

**Table 6-1: SWOT Analysis for Lesson Study Expansion**

| Strengths | Weaknesses |
|---|---|
| - Teachers in the treatment group to serve as trainers on Lesson Study<br>- Direct contribution to improvements in actual lesson delivery<br>- Low cost at school level<br>- Positive impact on collegiality and teachers' confidence | - Many steps to be taken to complete<br>- Teachers' overloaded timetables<br>- Lack of experienced resource persons<br>- No constructive follow up system by SCC |
| Opportunities | Threats |
| - Increasing teacher's awareness about Lesson Study<br>- Sector CPD training as an opportunity to introduce Lesson Study<br>- Possible inclusion of Lesson Study in the performance contract<br>- CPD to be included in districts' performance contracts (Imihigo) | - Time conflict with other forms of CPD activities both at school and sector levels |

### 6.3.3 Way Forward

In September 2019, REB issued a letter to Mayors requesting inclusion of CPD in their performance contracts (Imihigo). In response to this, districts are required to allocate budget for CPD as well. This is likely to grow the momentum toward planning and implementation of CPD at district, sector and school levels. In these circumstances, weaknesses listed in the SWOT analysis should also be tackled to expand Lesson Study to more schools. The following measures should be taken by different stakeholders.

#### (1) Arrange Timetables

As recommended in the National Teacher CPD Framework, HTs should include CPD time in the school timetable for all teachers. If finding the time for all teachers to meet is difficult, HTs may start with allocating CPD time by department levels to promote collaboration among teachers who teach the same subjects. In doing so, teachers may be able to plan ahead for Lesson Study activities throughout the term, for example.

### (2) Foster CPD Monitoring Mechanism from School to National levels

Teachers should be able to get feedback and support from experts to continuously improve their competences. Monitoring from SCCs can serve as an opportunity for teachers to gain objective feedback from external experts. It would also motivate them to continue CPD. To enable such monitoring, schools and the SCC of the sector should closely communicate their activity plans with each other. Furthermore, the communication between SCCs and DCC of the district should be also strengthened so that information such as good practices, challenges and activity plans are shared for continuous improvement in activities. REB should eventually monitor CPD at different levels through this mechanism. The education sector is going to launch online monitoring tools for DCCs and SCCs to report their activities on a termly basis. The online monitoring is expected to strengthen the mechanism.

# Part III

# Conclusion

# 7. Conclusion

## 7.1 Findings and Discussion

The SIIQS Project has worked on improving teachers' understanding and skills in CBC and learners' HOT skills through Lesson Study. It also has raised awareness of education stakeholders and conducted monitoring to enhance conducive CPD environments which enable teachers to continuously improve lessons.

In Part I, we examined changes in lessons in the treatment group in comparison with those in the control group. The analysis revealed that teachers' understanding of CBC in the treatment group was higher and lesson plans improved much more than in the control group. Teachers in the treatment group improved facilitation skills and applied "indirect teaching", the ideal pedagogy in CBC. Learners in the treatment schools were more likely to enjoy more opportunities to interact with each other and construct knowledge by themselves than in the control schools. The overall results of AATs in the treatment group was significantly higher than in the control group and implied that HOT skills especially improved. These findings suggest that teachers' proficiency in CBC can improve by continuing Lesson Study, which can lead to improvement in academic performance and development of HOT skills.

In Part II, we investigated supporting mechanisms which could enable sustainable implementation of Lesson Study or CPD by teachers. Lesson Study satisfies all of the features of effective teacher professional development identified by Darling-Hammond et al. (2017). Teachers' perception towards school circumstances including school management and collegiality was positive in the treatment schools where Lesson Study was implemented. In fact, CPD had been implemented in all schools in some form, and teachers who participated in CPD regularly had more positive views towards school circumstances than those who participated here and there. In short, Lesson Study and frequent participation in CPD had a positive correlation with teachers' perception about school circumstances. On the other hand, teachers and local education officers recognized obstacles for CPD such as lack of time, unavailability and insufficient capacity of resource persons, and unsupportive school leadership. These are among the features of effective professional development and should be addressed by DCCs and SCCs in order to expand Lesson Study at Rwandan schools. SEOs of the sectors where the treatment schools are located were willing to disseminate Lesson Study to other schools in their areas, and even had ideas to make it happen.

## 7.2 Achievement of PDM

To sum it up, most KPIs stipulated in the PDM have been achieved and we can conclude that the SIIQS Project has been successfully implemented.

Table 7-1 summarized the achievement of each KPI with findings from the ELS underlined. Positive changes were seen across all KPIs, and Lesson Study is likely to have contributed to them. As to regards with implementation of CPD and sustainability of Lesson Study, however, the following challenges were often reported from various stakeholders.

Challenges of CPD

- Lack of time
- Unavailability and insufficient quality of resource persons
- Insufficient support from school leadership
- Lack of budget

**Table 7-1: Achievement of the KPIs in the PDM**

| Narrative Summary | Objectively Verifiable Indicators | Achievement |
|---|---|---|
| Overall Goal | | |
| Students' learning process in classroom is improved. | 1) More students in a model school than those in a control school present relevant responses to an open question posed by a teacher. | Students in the model (treatment) schools were given more opportunities to present open-ended responses. |
| | 2) Result of the academic achievement test developed by the Project improves more in model schools compared to control schools. | The overall results of AATs in the treatment group was significantly higher than in the control group and implied that HOT skills especially improved. |
| Project Purpose | | |
| Implementation of CBC-based lesson in the classroom is strengthened through SBI[11] activities. | 1) Lesson plans developed by teachers in model schools include all elements specified in Competence 2.1 of the National Teacher CPD Framework. | Lesson plans of the treatment group became more detailed and included most elements stipulated in the National Teacher CPD Framework. |
| | 2) Teachers give more open questions in model schools compared to control schools. | Teachers in the treatment group gave more open questions than those in the control group. |
| Outputs | | |
| 1. Teachers' understanding of CBC-based lesson implementation is enhanced. | 1) Post-test results of participants in trainings and workshops including an e-learning course exceed 70%. | Not evaluated in the ELS |
| | 2) Self-evaluation of teachers' understanding of CBC-based lessons continues to be 90% or above. | Teachers understanding of CBC was nearly 98%. |
| 2. Problem-solving capacities are enhanced at school, sector, district, and national level. | 1) All sectors implement sector-based CBC training. | Not evaluated in the ELS |
| | 2) More than one good practice of school-based CPD is reported quarterly from all DCCs that have been established. | Not evaluated in the ELS |
| | 3) The rate of teachers' participation in school-based CPD increases from 75% (baseline) to 90%. | 98% of teachers participated in CPD in the sampled schools (treatment and control groups). |
| | 4) More than 50% of DCCs and SCCs submit monitoring reports using a developed form on monthly basis. | Not evaluated in the ELS |

Now that REB requested districts to include CPD in their district performance contract (Imihigo) and the momentum towards CPD keeps growing. The solutions are to secure CPD time for teachers and to operationalize DCC/SCC activities in order to support schools in their locality. The following actions should be taken by stakeholders.

- Strengthen school leadership so that HTs fully understand the importance and benefit of CPD, and allocate time for CPD in teachers' timetables
- Assess capacity of resource persons regularly and provide training based on their needs to develop their skills effectively and efficiently
- Build capacity of DCCs and SCCs by raising awareness of stakeholders such as vice mayors and executive secretaries of sectors
- Establish effective monitoring mechanisms from school to national levels

[11] SBI stands for "School-Based In-service training". The terminology was common when the Project was formulated. However, the idea has evolved into the broader concept named CPD and is no longer used nowadays.

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# Appendices

# Appendix A
# Academic Achievement Test

A-1: P4 level math

A-2: P4 level science

A-3: S1 level math

A-4: S1 level science

A-5: S4 level math

A-6: S4 level science

# JICA SIIQS Project

## Mathematics Test for Primary School Pupils

Names/ **Amazina:**_____ _____ _____

School/ **Ikigo**: _____ Class/ **Umwaka:** _____

Student Number/ **Numero y'umunyenshuri:** _____

***** Sample/ **Urugero** **********

Calculate/**Erekana igisubizo nyacyo** 2 + 5 =

A. 0 ✓B. 7 C. 10 D. 3

Circle or ✓ here. Choose only one answer.

Koresha akaziga cg ushyireho aka kamenyetso: ✓ kugisubizo nyacyo

**********

1. 7 + 2 = ☐

A. 5 B. 72 C. 9 D. 27

2. The digit in the thousand's place in 72081 is … **Umubare uri mu mwanya w'ibinyagihumbi muri** 72081 **ni....**

A. 7 B. 2 C. 0 D. 8

3. Calculate/ **Erekana igisubizo nyacyo** : $8 \times 7$

A. 42 B. 49 C. 56 D. 15

4. Add/ **Erekana igisubizo gihwanye na** :

$$\begin{array}{r} 1\ 4 \\ +\quad 7 \\ \hline \\ \hline \end{array}$$

A. 7 B. 11 C. 21 D. 111

5. Calculate/ **Erekana igisubizo nyacyo** : 10 – 2 + 5

A. 3 B. 7 C. 13 D. 17

6. Multiply / **Erekana igisubizo nyacyo**: $302 \times 50$

A. 1600 B. 16000 C. 1510 D. 15100

7. Divide/ **Erekana igisubizo nyacyo** : $276 \div 4$

A. 59 B. 69 C. 79 D. 64

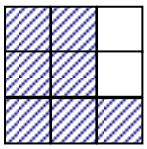
8. Add / **Erekana igisubizo nyacyo**: 597 + 236

A. 733 B. 833 C. 823 D. 723

9. Subtract/ **Erekana igisubizo nyacyo** : 600 – 236

A. 264 B. 374 C. 464 D. 364

10. What fraction of the diagram below is shaded?/ **Ni uwuhe mugabane ungana n 'ahasharuye muri iki gishushanyo?**



A. $\frac{7}{2}$

B. $\frac{9}{7}$

C. $\frac{7}{9}$

D. $\frac{2}{7}$

11. Which of the following fractions is the smallest?/ **Mu migabane ikurikira ni uwuhe muto kurusha iyindi?**

$\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}.$

A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$

12. Calculate/ **Erekana igisubizo nyacyo** : $\frac{2}{7}+\frac{3}{7}$

A. $\frac{6}{7}$ B. $\frac{5}{14}$ C. $\frac{5}{7}$ D. $\frac{8}{7}$

13. Simplify/ **Erekana igisubizo nyacyo** : $\frac{2}{5}\times\frac{3}{4}$

A. $\frac{3}{10}$ B. $\frac{3}{5}$ C. $\frac{5}{9}$ D. $\frac{8}{15}$

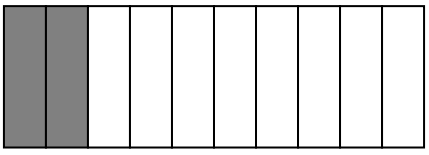
14. $\frac{4}{6}-\frac{1}{6}=\mathrm{m},$ m is …

A. $\frac{1}{3}$ B. $\frac{1}{9}$ C. $\frac{1}{18}$ D. $\frac{1}{2}$

15. Which of the following is equal to 0.4? / **Mu mibare ikurikira ni uwuhe ungana na 0.4?**

A. 4 B. $\frac{4}{10}$ C. $\frac{4}{100}$ D. $\frac{1}{4}$

16. Which decimal number does the following shaded part express?/ **Mu mibare y' ibice ikurikira ni uwuhe ungana n'ahasharuye mu mbonerahamwe ?**



A. 2.8 B. 0.5 C. 0.2 D. 0.02

17. Change $\frac{123}{100}$ to a decimal number. / **Ni uwuhe mubare ungana na $\frac{123}{100}$ uwuhinduye mbibice?**

A. 0.23 B. 1.023 C. 1.23 D. 12.3

18. Calculate/ **Erekana igisubizo nyacyo**: 0.23 + 1.37

A. 0.7 B. 1.7 C. 1.6 D. 1.5

19. Calculate/ **Erekana igisubizo nyacyo**: $19.82 - 5.28$

A. 14.64 B. 14.54 C. 14.66 D. 14

20. Change 1.25 metres to centimetres. / **Uhinduye metero 1.25 muri centimetero, nikihe gisubizi bingana?**

A. 12.5 cm B. 125 cm C. 1250 cm D. 102.5 cm

21. Emmanuel gets 0.5 litres of tomato juice from 5 tomatoes. How many litres of the juice can he get from 15 tomatoes? / **Manweli akura 0.5 litiro z'umutobe mu nyanya 5. Azakura litiro z'umutobe zingahe mu nyanya 15?**

A. 1.5 litres B. 2 litres C. 2.5 litres D. 3 litres

22. A book contains 130 pages. Claudine read 78 pages of it. Which of the following shows the rest of the pages left? / **Igitabo gifite impapuro 130. Kolodina amaze gusoma impapuro 78 zacyo. Ni ikihe kigereranyo k'impapuro asigaje gusoma mu bigereranyo biri hasi?**

A. $130 + 78 = \square$

B. $\square - 78 = 130$

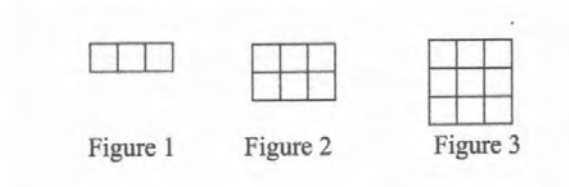
C. $130 \div 78 = \square$

D. $130 - 78 = \square$

23. About how long is this picture of a pencil?/ **Ugereranyije, iyi karamu ifite uburebure bungana bute?**

A.5 cm B. 10 cm C. 20 cm D. 30 cm

24. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6? / **Aha ni intangiriro y'igishushanyo cy'amabati. Iki gishushanyo nigikomeza, kizaba kiriho amabati angana ate?**




A. 12 B. 15 C. 18 D. 21

25. Find the collect sign to compare the following number./ **shyiramo ikimenyetso gikwiye mu kugereranya imibare ikurikira**

Seven hundred/Magana arindwi ☐ 617 + 83

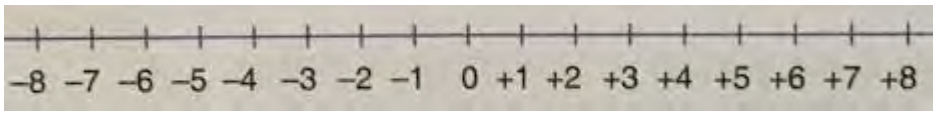
A. =

B. >

C. <

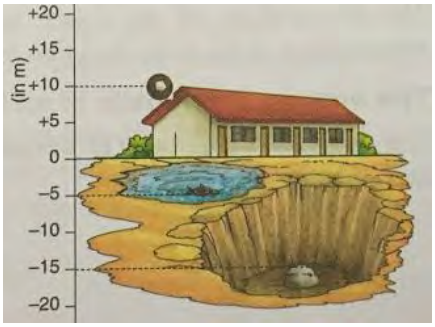
D. None of the above/ **nta na kimwe muri ibyo gihari**

26. What is the distance between -3 and +6 on the number line? **Ni iyihe ntera iri hagati ya -3 na +6**




A. 3 B. 9 C. -3 D. -9

27. Study the diagram below and find the position of the top of the roof./ **reba kugishushanyo gikurikira maze werekane aho igisenge cy'iyo nzu kiri**




A. -5 m

B. 0 m

C. +5 m

D. +10 m

28. Find the LCM of 12 and 15 / **Niyihe LCM ya 12 na 15**

A. 3 B. 27 C. 60 D. 180

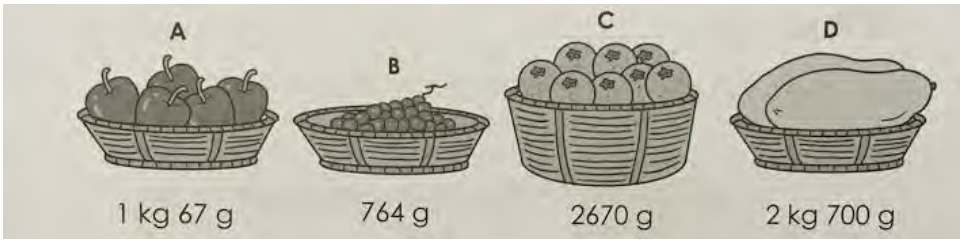
29. Evaluate/ **Erekana igisubizo nyacyo** $\sqrt{16}$

A. 3 B. 16 C. 4 D. 8

30. Calculate/ **Erekana igisubizo nyacyo.** 5 m 25 cm – 1 m 40 cm

A. 4 m 15 cm B. 6 m 65 cm C. 4 m 65cm D. 3 m 85 cm

31. Find the correct answer./ **Erekana igisubizo nyacyo:**



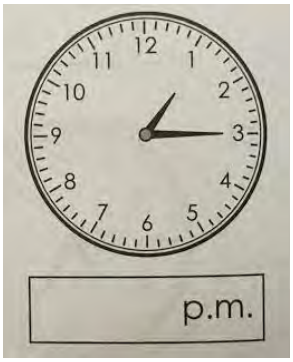

A. Basket A is the lightest./ **Igiseke A nicyo cyoroshye kurusha ibindi**

B. Basket C is the heaviest./ **Igiseke C nicyo kiremereye kurusha ibindi**

C. Basket A is lighter than Basket B /**Igiseke A cyoroshye kurusha igiseke B**

D. Basket D is heavier than Basket C / **Igiseke cya D kiremereye kurusha igiseke cya C**

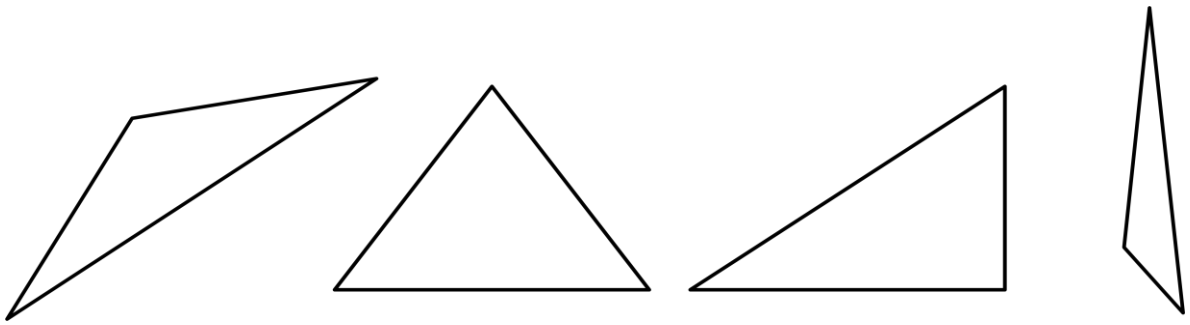
32. What time is it? / **Hitamo igisubizo cyerekana isaha kuri iki gishushanyo**




A. 1:15 B. 1:03

C. 3:01 D. 3:10

33. Choose right angled triangle. / **Hitamo ishusho ya mpandeshatu igororotse**



A B C D

# JICA SIIQS Project

## Science Test for Primary School Pupils

Name (**Amazina**): _____ _____

School (**Ikigo):** _____ Class (**Umwaka**): _____

Circle or tick only ONE letter of the best answer from A, B, C and D

**(Shyira akamenyetso kugisubizo kimwe cy'ukuri hagati y'ibisubizo A, B, C na D)**

**********Sample/ **Urugero** **********

Calculate / Kora iyi mibare: 2 + 5 =

A. 0

(B.) 7

C. 10

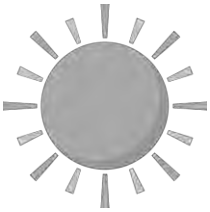
D. 3

**Circle or ✓ here.**

**Caho akaziga cg ushyire akamenyetso ka ✓**

**********

1. Which one is a living thing? Muri ibi bintu bikurikira ni ikihe gifite ubuzima?



Sun/ **Izuba**

A.

Rock/ **Urutare**

B.

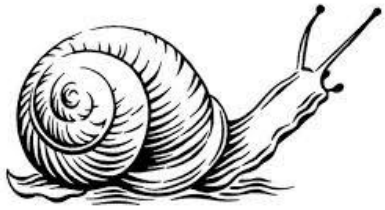
Tree/ **Igiti**

C.

Water/ **Amazi**

D.

2. A snail is a living thing./ **Ikinyamunjongo ni ikinyabuzima**



**Snail**

Which is a wrong explanation about it? / **Mu bisobanuro bikurikira ni ikihe kitari ukuri?**

A. A snail change its size.
**Ikinyamunjongo gihindura ingano yacyo**

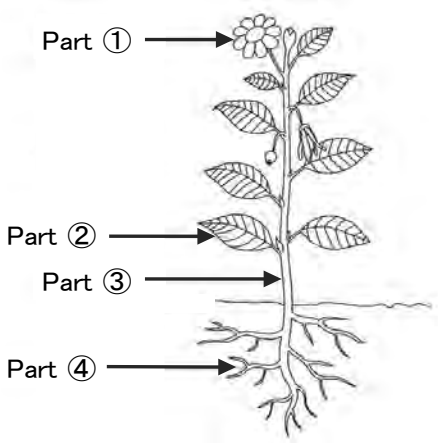
B. A snail moves.
**Ikinyamunjongo kiragenda**

C. A snail does not reproduce its children.
**Ikinyamunjongo ntikibyara**

D. A snail needs food.
**Ikinyamunjongo gikenera kurya**

The diagram shows flowering plants/ **Iki gishushanyo kiragaragaza ibice by'ikimera gifite indabyo**

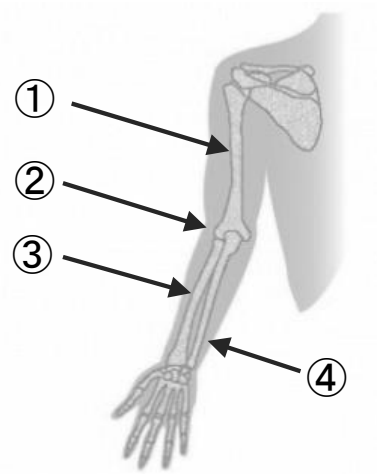
3. What is the name of part ④? **Igice cya ④ cy' icyo gishushanyo kitwa ngo iki?**
   A. Flower/ **Ururabyo**
   B. Stem/ **Igihimba**
   C. Leaf/ **Ikibabi**
   D. Root/ **Umuzi**




4. Which part absorbs water from the soil?
   **Ni ikihe gice cy'ikimera gikurura amazi mu butaka?**
   A. part ① / **Igice cya ①**
   B. part ②/ **Igice cya ②**
   C. part ③/ **Igice cya ③**
   D. part ④/ **Igice cya ④**

5. Which one is an important thing for plant growth? /
   **Muri ibi bintu bikurikira ni ikihe gifite akamaro kanini mu gukura kw 'ikimera?**
   A. Electricity/ **Amashanyarazi**
   B. Sunlight/ **urumuri rw'izuba**
   C. Oil/ **Amavuta**
   D. Salt/ **Umunyu**

6. The diagram shows bones of the right arm and hand.
**Iki gishushanyo kirerekana amagufa y' ukuboko kw'iburyo n'ikigan za cyakwo.**




You can bend your arm at the joint.

**Ushobora guhinira ukuboko munkokora**

Which part is the joint of the arm? **Ni ikihe gice kiri mu ifatanyirizo ry' ukuboko?**

A. ①
B. ②
C. ③
D. ④

7. Which of the followings is **NOT Correct** on the explanation of Animals?
**Mu bisobanuro bikurikira ni ikihe kitari ukuri ?**

A. Vertebrate has five categories namely fish, amphibian, reptiles, birds and mammal / **Ibinyabuzima bigira urutirigongo birimo amoko atanu (5): amafi, ibikeri, ibikururanda, ibiguruka, n'ibinyamabere**
B. Invertebrate animals do not have backbone/ **Ibinyabuzima bitagira urutirigongo**
C. Mammals have udder/ **ibinyamabere bifite icebe**
D. All domestic animals are mammals/ **Amatungo aba mu rugo yose ni inyamabere**

8. Which animal(s) belong to mammal? **Mu nyamaswa zikurikira , inyamabere ni izihe?**

① Rabbit/ **Urukwavu**

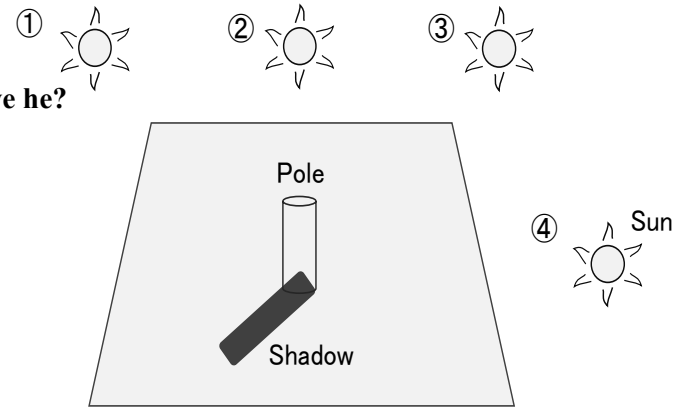
② Cow/**Inka**

③ Chicken/**Inkoko**

④ Snake/**Inzoka**

A. ① is mammal. / **① ni inyamabere**
B. ①and② are mammal. / **① na ② ni inyamabere**
C. ①, ② and ③ are mammal. / **①, ② na ③ inyamabere**
D. ①, ②, ③ and④ are mammal. / **①, ② , ③ na ④ ni inyamabere**

9. Shadow of the pole is formed on the ground.
Where does the Sun locate at?
**Niba Igicucu cya Pole cyiremye hasi. Izuba rihereye he?**



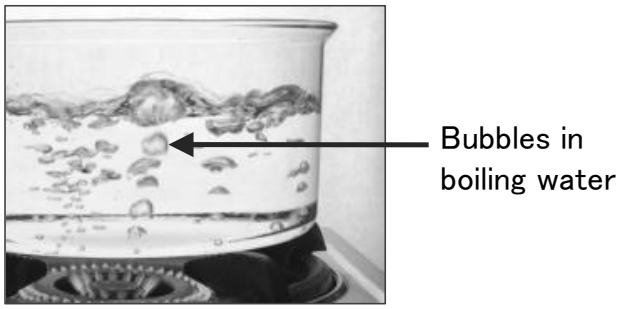

A. ①
B. ②
C. ③
D. ④

10. The moon does <u>not</u> give off its own light. Why can you see the Moon?

**Ukwezi ntikumurikisha urumuri rwakwo. Kuki tukubona?**

A. It bends light from the Sun / **kugonda urumuli ruva mu zuba**
B. It gets through light from the Sun / **gufatira murumuli ruva ku zuba**
C. It takes in light from the Sun / **kwihereza ku rumuli rw'izuba**
D. It reflects light from the Sun / **kumurikisha urumuli ruturutse ku zuba**

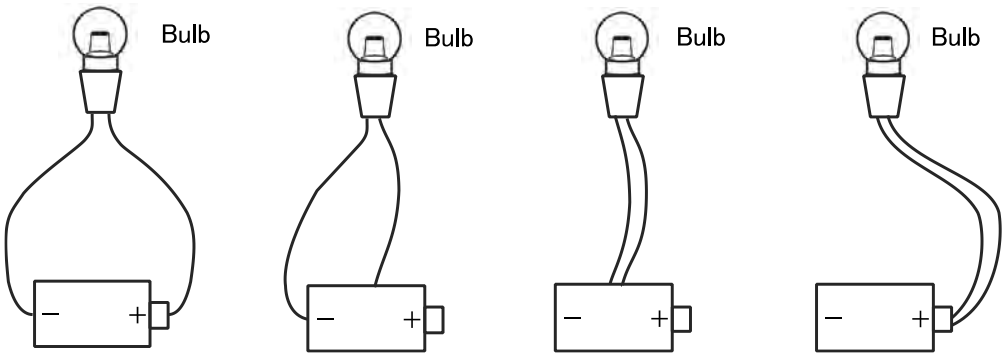
11. In the photo, water is boiling.
What is in the bubbles of boiling water?
**Iyi foto irereka amazi abira.**
**Ni iki kiri muri turiya tubumbe tugaragara mu mazi ari kubira?**




A. Air / **Umwuka usanzwe**
B. Ice / **Barafu**
C. Water vapour/ **Umwuka w'amazi**
D. Glass / **Ikirahure**

12. Which diagram shows the connection that can make the bulb light?

**Ni ikihe gishushanyo cyerekana uburyo urumuri rwo mu itara ruboneka?**



13. Which one can conduct electricity?
**Ni ikihe muri ibi bintu gishobora gutwara umuriro w'amashanyarazi?**

Plastic bag/ **ishashi**

A.

Iron nail/ **umusumari**

B.

Glass bottle/ **icupa ry'ikirahure**

C.

Wood ruler/ **ilati y'igiti**

D.

14. Which one is a **Wrong** explanation about sound? / **Mu bisobanuro bikurikia ni ikihe kitari cyo kubijyanye n' ijwi?**

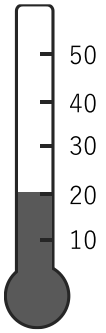
A. Sound does not travel through water./ **Ijwi ntirishobora kwambukiranya amazi**

B. Sound travels through the air. / **Ijwi rishobora kwambukiranya umwuka**

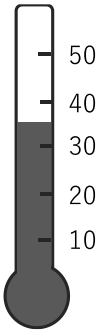
C. Sound travels through the wall./ **Ijwi rishobora kwambukiranya igikuta**

D. Sound travels through the human body./ **Ijwi rishobora kwambukiranya umubiri w'umuntu**

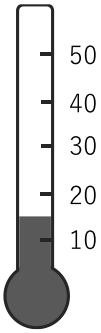
15. Which thermometer reading shows the hottest?/ **Ni ikihe gipimo cy'ubushyuhe kerekana ubushyuhe bwinshi muri ibi bikurikira?**



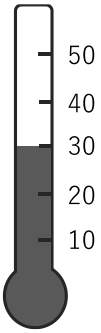

A.




B.




C.




D.

16. Which of the following is attracted by a magnet?
**Ni ikihe muri ibi bikurikira gifatwa na rukuruzi?**

A. Aluminium foil./ **Ishashi ya Aluminiyumu**

B. Paper bag/ **Urupapuro rwo gutwaramo ibintu**

C. Pencil/ **ikaramu y'igiti**

D. Iron nail/ **Umusumari**

17. Which of the following statements is NOT correct about types of Food?

**Ni iyihe ngingo muri izi zikurikira ITAVUGA ukuri kuri ubu bwoko bw'ibiryo?**

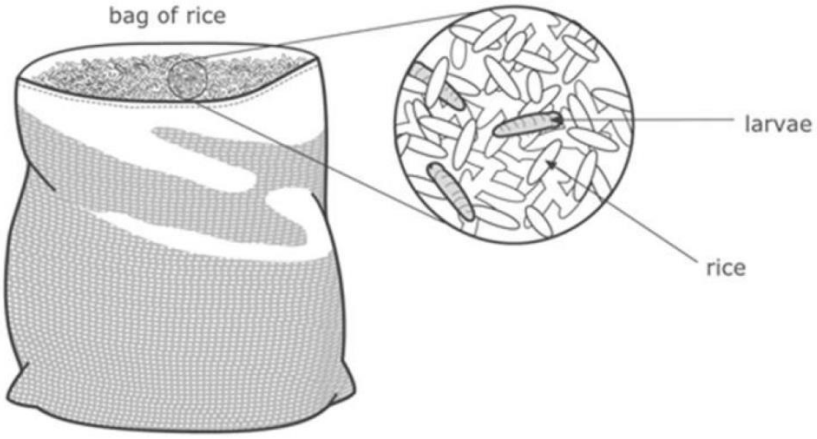
A. Fruit and Vegetables keep us hungry. / **Imbuto n'imboga zituma dusonza**

B. Dairy (milk) products make our bones strong./**Amata n'ibiyakomokaho bituma amagufa yacu akomera**

C. Grains (or cereals) give us energy./ **ibinyampeke bitwongerera imbaraga**

D. Meat helps us grow and makes us strong./ **Inyama zituma dukura tukanakomera**

18. Larvae were found in a bag of rice. What best explains the larvae got there? / **Udusimba twabonetse mu mufuka w'umuceli. Ni ikihe gisobanuro cyagaragaza neza aho twaturutse?**




A. They came from water in the bag./ **Twaje mu mazi yari mu mufuka**

B. They came from the air in the bag. / **Twaje mu mwuka wari mu mufuka**

C. They came from the rice itself./ **Twaje mu muceri ubwawo**

D. They came from eggs laid by insects./ **Twaturutse mu magi yatewe n'utundi dusimba**

**END**

Appendix A-3

# JICA SIIQS Project

## Maths Test for Secondary School Students (Lower Secondary)

Name:_____ _____ _____
First name Middle name Family name

School: _____ Class: _____ Student Number: _____

***** Sample **********

Calculate 2 + 5 =

A. 0 ✓B. 7 C. 10 D. 3

**Circle or ✓ here.**

**Choose only one answer.**

**********

1. Calculate : $8 \times 7$

A. 42 B. 49 C. 56 D. 15

2. Calculate : $4 + 4 \div 4 - 4$

A. 0 B. 1 C. -2 D. 8

3. Simplify : 26 – 32 + 43

A. 29 B. 49 C. 37 D. 101

4. Simplify : 23 – (– 42)

A. 29 B. 21 C. -19 D. 65

5. Find the remainder of the following : $489 \div 37$

A. 13 B. 6 C. 7 D. 8

6. The sum 691 + 208 is closest to the following sum

A. 600 + 200 B. 700 + 200 C. 700 + 300 D. 900 + 200

7. Multiply : $-12 \times (-25)$

A. 120 B. –240 C. –300 D. 300

8. Subtract : 2.201 – 0.753

A. 1.448 B. 1.458 C. 1.548 D. 1.558

9. Divide : $24.6 \div 0.04$.

A. 0.615 B. 6.15 C. 61.5 D. 615

10. Multiply 0.203 by 0.56

A. 0.1288 B. 0.01288 C. 0.11368 D. 0.011368

11. Calculate the following : $\frac{3}{8} \div \frac{3}{4}$

A. $\frac{9}{32}$ B. $\frac{1}{2}$ C. $\frac{3}{4}$ D. $-\frac{1}{2}$

12. Simplify : $\frac{3}{4} + \left(\frac{2}{3} \times \frac{1}{4}\right)$

A. $\frac{1}{8}$ B. $\frac{5}{16}$ C. $\frac{5}{6}$ D. $\frac{11}{12}$

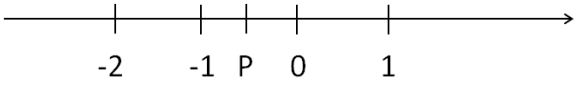
13. Which of the following fractions is the smallest? $\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}$.

A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$

14. In which list of fractions are all of the fractions equivalent respectively?

A. $\frac{1}{2}, \frac{2}{4}, \frac{4}{6}$ B. $\frac{2}{3}, \frac{4}{6}, \frac{8}{12}$ C. $\frac{2}{5}, \frac{4}{10}, \frac{8}{50}$ D. $\frac{3}{4}, \frac{2}{4}, \frac{4}{6}$ E. $\frac{3}{4}, \frac{4}{6}, \frac{6}{8}$

15. What number does the letter P represent on the number line below?

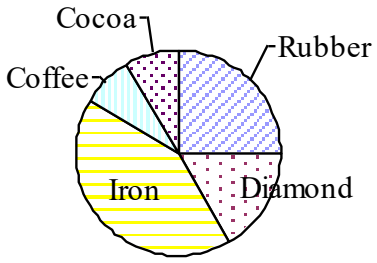



A. $-\frac{3}{2}$ B. $-\frac{1}{2}$ C. $\frac{1}{2}$ D. $\frac{3}{2}$

16. Change 35% to the simplest fraction.

A. $\frac{7}{2}$ B. $\frac{7}{20}$ C. $\frac{7}{200}$ D. $\frac{7}{2000}$

17. The pie graph below shows the main export of a country. What percentage of the shaded portion of the exports is rubber?




A. 10% B. 15% C. 20% D. 25%

18. Find the value of $x$, if $12x - 10 = 6x + 32$ .

A. 5 B. 6 C. 7 D. 8

19. If the ratio 7 to 13 is the same as the ratio $x$ to 52, what is the value of $x$?

A. 7 B. 13 C. 28 D. 364

20. An American tourist wants to change $30.00 American dollars to Rwandan francs. How much Frw will he receive if $1.00 exchanges for 820 Rwf?

A. 246 Rwf B. 2,460 Rwf C. 24,600 Rwf D. 820 Rwf

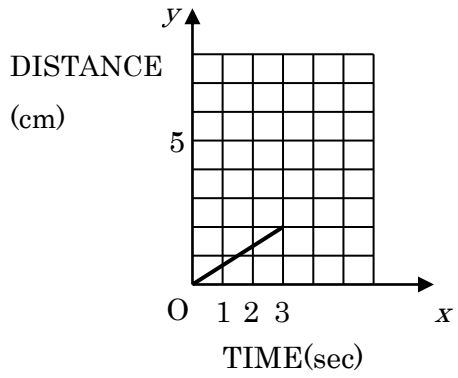
21. If $x$ is proportional to $y$ in the following table, find the value of $p$ and $q$ below.

| $x$ | 3 | 6 | $q$ |
|---|---|---|---|
| $y$ | 7 | $p$ | 35 |

A. $p = 14, \quad q = 31$ B. $p = 10, \quad q = 14$

C. $p = 10, \quad q = 31$ D. $p = 14, \quad q = 15$

22. This graph shows how fast an ant walks along the straight line. If this ant keeps walking at the same speed as ever, what is the distance that this ant walks in 30 seconds?




A. 5cm B. 6cm C. 20cm D. 25cm

23. The table represents a relation between $x$ and $y$. What is the missing number in the table?

A. 9

B. 10

C. 11

D. 12

| $x$ | $y$ |
|---|---|
| 2 | 5 |
| 3 | 7 |
| 4 | ? |
| 7 | 15 |

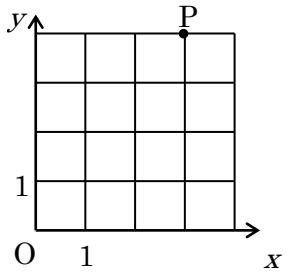
24. What are the coordinates of point P?

A. (3, 4)

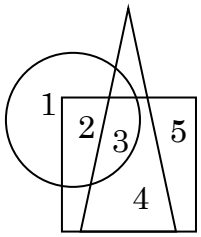
B. (4, 3)

C. (–3, 4)

D. (3, –4)



25. In the figure below, which number belongs to the square, the circle and not to the triangle?




A. 1

B. 2

C. 3

D. 4

E. 5

26. Which is the smallest number among the following?

700mm, 6cm, 0.15m, 0.002km

A. 700mm B. 6cm C. 0.15m D. 0.002km

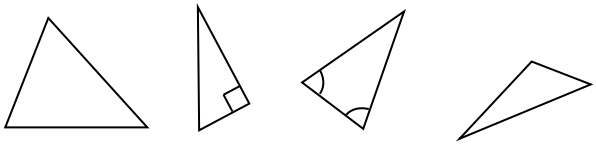
27. Which of the following is the closest to the value of

$\pi : \frac{\text{circumference}}{\text{diameter}}$ ?

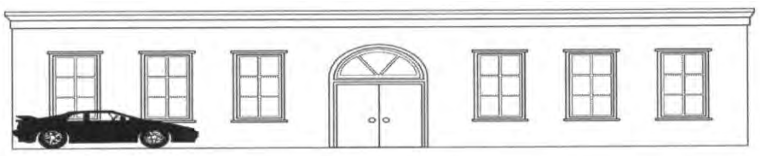
A. 1.5 B. 2.1 C. 3.1 D. 4.1

28. Which of the following is an isosceles triangle?

A. B. C. D.



29. The car is 3.5m long. About how long is the building?



A. 18m B. 14m C. 10m D. 4m

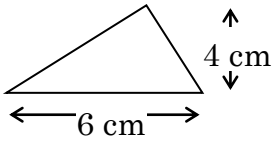
30. Which of the following is the area of a triangle whose base and height are 6 cm and 4 cm respectively?

A. 10 $cm^2$

B. 12 $cm^2$

C. 24 $cm^2$

D. 10 cm



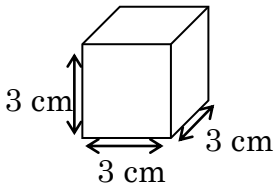

31. What is the volume of the cube below?

A. 9 $cm^3$

B. 18 $cm^3$

C. 27 $cm^3$

D. 64 $cm^3$



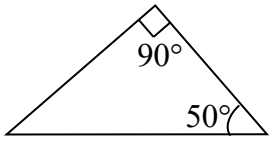

32. What is ∠ABC in the triangle below?

A. 20°

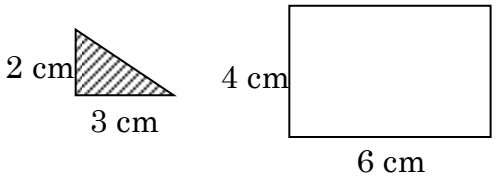
B. 40°

C. 50°

D. 80°

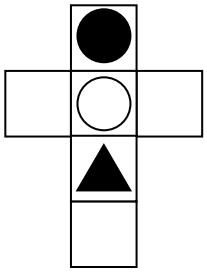



33. How many of the shaded right-angled triangles below are needed to cover exactly the surface of the given rectangle?



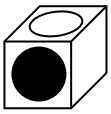

A. Four B. Six C. Eight D. Ten

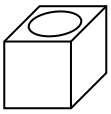
34. Which of the following cubes could be made by folding the figure below?



A.

B.

C. 

D. 

35. Find the highest common factor (HCF) and the least common multiple (LCM) of 12 and 18.

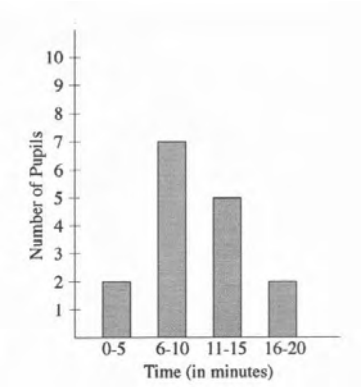
A. HCF = 4, LCM = 36

B. HCF = 6, LCM = 36

C. HCF = 6, LCM = 48

D. HCF = 8, LCM = 48

36. The graph shows the time of travel by students from home to school. How many pupils must travel for MORE THAN 10 minutes?




A. 2

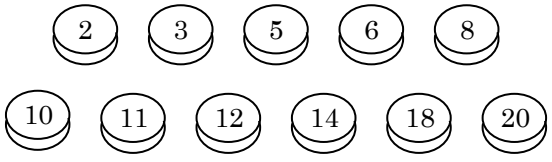
B. 5

C. 7

D. 8

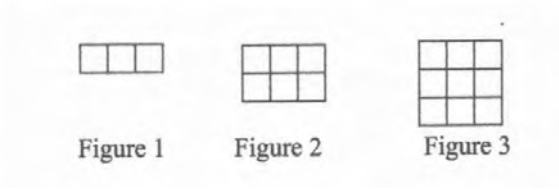
E. 15

37. The eleven chips below are placed in a bag and mixed. Emmanuel draws one chip from the bag without looking. What is the probability that Emmanuel draws a chip with a number that is a multiple of three?




A. $\frac{1}{11}$ B. $\frac{1}{3}$ C. $\frac{4}{11}$ D. $\frac{3}{11}$

38. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6?



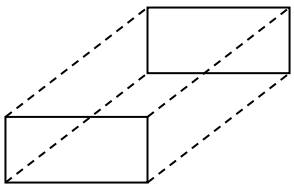

A. 12 B. 15 C. 18 D. 36

39. How many Common Multiples of 2 and 3 are between 1 and 20?

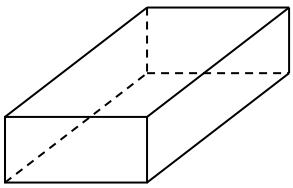
A. 1 B. 3 C. 6 D. 10

40. Which of the dotted lines in the shapes drawn below show the hidden edges of the cuboid?

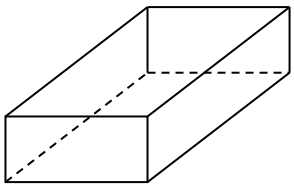
A.



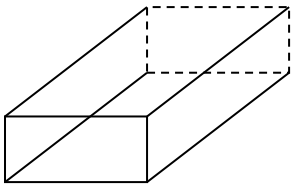
B.



C.



D.



Appendix A-4

# JICA SIIQS Project

## Science Test for Secondary School Students (Lower Secondary)

Name:_____ _____ _____
First name Middle name Family name

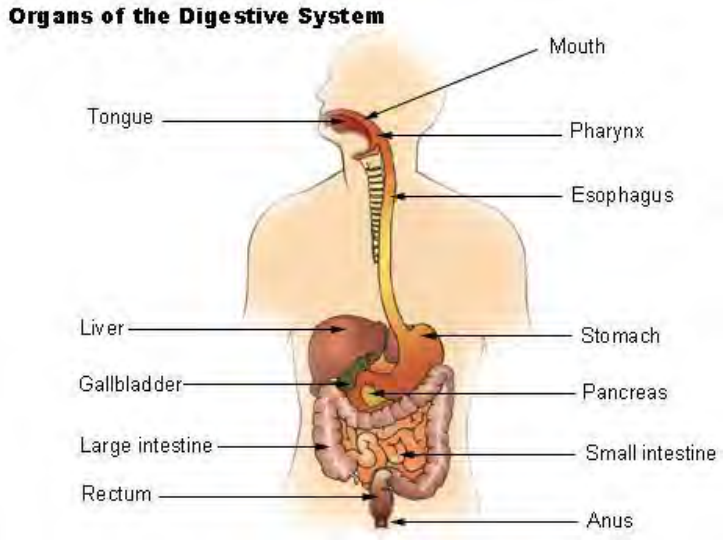
School: _____ Class: _____ Student Number: _____

### PART A

**Circle the letter of the best answer choice from A, B, C and D. (Choose Only ONE Answer)**

***Question 1***

Digestion is the process by which food is broken into simple substances which can be used by the body. It is an important process because it allows the body to get useful nutrients from the food that we eat. In which organ do we absorb important nutrition such as amino acids and glucose?




A. stomach

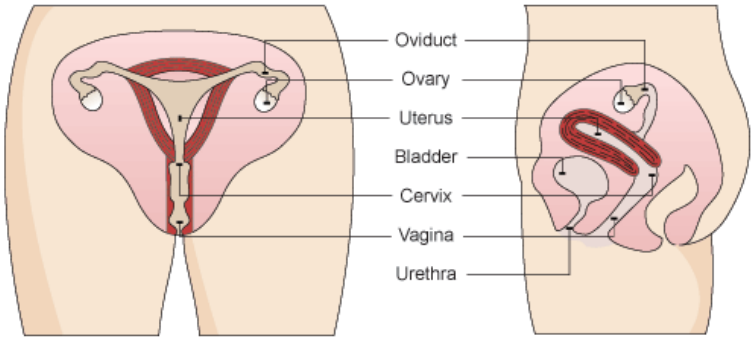
B. small intestine

C. large intestine

D. liver

***Question 2***

The figure below shows the female reproductive system. In which organ does fertilization take place?




A. ovary

B. oviduct

C. uterus

D. cervix

***Question 3***

Which of the following foods is correctly matched to its group?

A. ground nuts → energy giving

B. eggs → protective

C. carrots → energy giving

D. bananas → body building

***Question 4***

Which one of the following is the most effective preventive measure against the spread of sexually transmitted infections amongst the youth in schools?

A. seeking medical attention

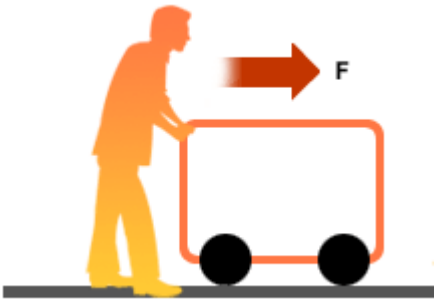
B. use of condoms

C. circumcision

D. taking a shower daily

***Question 5***

A force of 20N pushes a box 5m in the direction of the force. Calculate the work done.




A. 4 N/m

B. 15 Nm

C. 25 Nm

D. 100 Nm

***Question 6***

When suspended freely, a magnet always faces

A. Up-Down direction

B. North-South direction

C. West-East direction

D. Free direction

***Question 7***

Below are some examples of second class levers. Which statement for the second class levers is correct?

A. the load lies in between the effort and the fulcrum.

B. the fulcrum is always between the load and the effort.

C. the effort lies in between the load and the fulcrum.

D. it can be categorized into wheel, screws and gears.

***Question 8***

If you have a mixture of iron filings and sand, how can you separate them?

A. put them in water and boil them to remove sand

B. use magnet to attract iron filings

C. use filter to collect sand only

D. burn them to remove iron filings and cool them down

***Question 9***

Which one of the following consists of only materials that are ALL non-magnetic?

A. aluminium foil, piece of paper

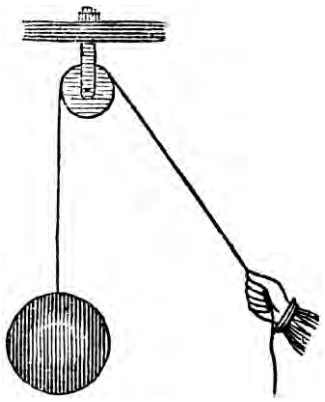
B. iron nails, plastic bottle

C. piece of glass, sewing needle

D. steel wool, water

***Question 10***

Which statement on the single fixed pulley is NOT correct?



A. it is made up of only one pulley which is fixed

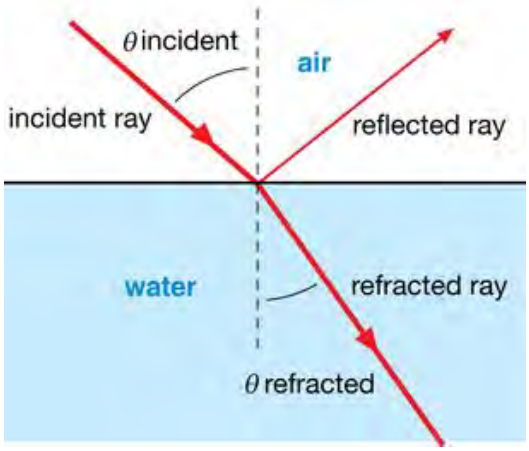
B. it reduces the effort needed and it changes the direction of the force

C. effort distance is equal to the load distance

D. it enables us to raise a load much higher than the person doing it

***Question 11***

Below is the diagram of incident ray, refracted ray and reflected ray at the boundary of air and water. Which statement is correct?




A. angle of incident is equal to angle of refraction

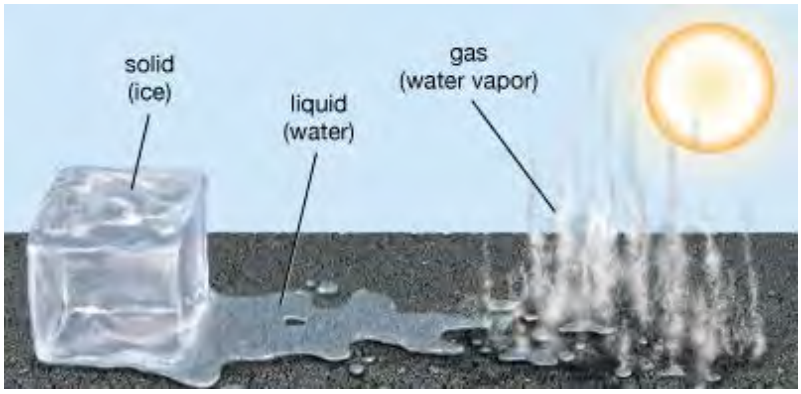
B. angle of incident is bigger than angle of refraction

C. angle of incident is smaller than angle of refraction

D. angle of reflection is equal to angle of refraction

***Question 12***

What do you call the process of the change of the states from gas to liquid?




A. evaporation

B. melting

C. condensation

D. sublimation

***Question 13***

Which statement on the inclined plane is NOT correct?

A. it is also known as a slope

B. the effort required to lift the brick when using an inclined plane is smaller than the effort required without the inclined plane

C. a bigger force is required when using the steep inclined plane, and a smaller force is required when the inclined plane is gentle.

D. it enables us to lift a plank of wood on a inclined plane by reducing the amount of work

End of Part A

## PART B

***Question 1***

Bacteria that enter the body are destroyed by which type of cells?

A. white blood cells

B. red blood cells

C. kidney cells

D. lung cells

***Question 2***

Many seeds can germinate in the light or in the dark. State two conditions necessary for germination.

A. Water and Air

B. Soil and Water

C. Sun light and Air

D. Germ and Soil

***Question 3***

The following table shows the classification of some animals into two categories.

| Category 1 | Category 2 |
|---|---|
| Rabbit | Frog |
| Giraffe | Spider |
| Elephant | Lion |

Which of the following was used to classify these animals?

A. organs used in breathing

B. food source

C. method of reproduction

D. pattern of movement

***Question 4***

What happens to the particles (molecules) of a liquid when the liquid cools?

A. They slow down.

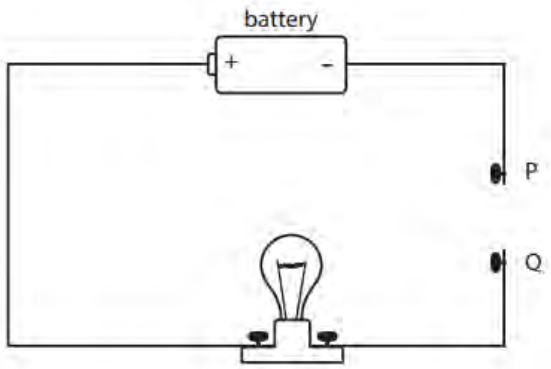
B. They speed up.

C. They decrease in number.

D. They decrease in size.

***Question 5***

Rods made of different materials are connected between points P and Q in the circuit diagram shown below.




Which rod would cause the bulb to light?

A. copper rod
B. wood rod
C. glass rod
D. plastic rod

***Question 6***

A student sets up an investigation to test the strength of magnets. He has several magnets of different sizes, shapes, and masses. He uses the magnets to lift metal paper clips. How is the strength of a magnet defined in the investigation?

A. by the mass of the magnet lifting the metal paper clips
B. by the size of the magnet lifting the metal paper clips
C. by the number of metal paper clips lifted by the magnet
D. by the time the metal paper clips stay on the magnet

***Question 7***

An object has a density of 1.1 g/cm$^3$. Liquid X, Y and Z have a density of

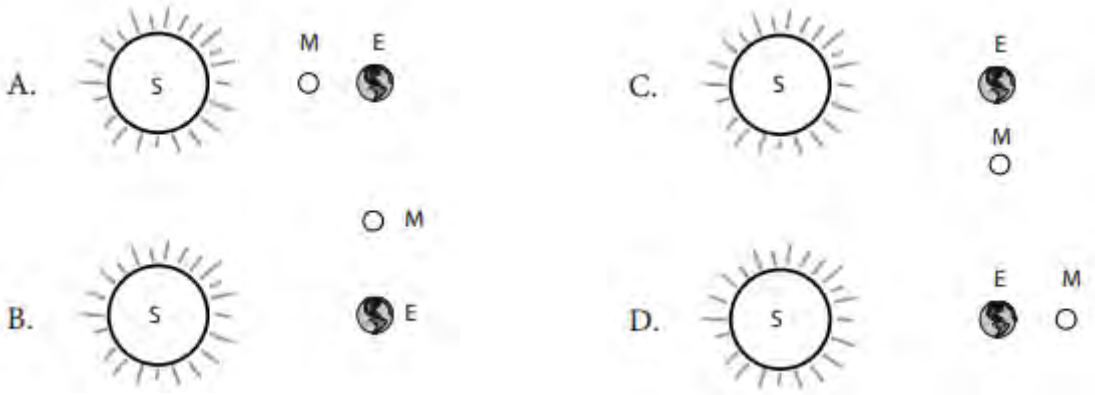
1.3 g/cm$^3$, 0.9 g/cm$^3$ and 1.2 g/cm$^3$, respectively. In which liquid would this object float?

A. Liquid X
B. Liquid Y
C. Liquid Z
D. Liquid X and Z

***Question 8***

Which diagram shows the position of the Sun (S), moon (M), and Earth (E)

during an eclipse of the moon? (Not drawn to scale)



***Question 9***

Some volcanic rocks have many holes in them.

How were the holes made?

A. Insects dug into the rock when it was soft.

B. Gas bubbles were trapped in the rock when it cooled.

C. Rain dropped on the rock when it was soft.

D. Small stones fell out of the rock when it cooled.

***Question 10***

Which statement is NOT correct on how you can you make use of computer at school or at home?

A. Writing documents

B. Drawing pictures

C. Cooking breakfast

D. Searching information

***Question 11***

How often have you used laptop computers at your school or at home.

A. Almost everyday

B. Once in a week

C. Once in a month

D. Never used

***Question 12***

Calculate the volume of a body with 0.8 g/$cm^3$ and 240g.

A. 192 $cm^3$

B. 239.2 $cm^3$

C. 240.8 $cm^3$

D. 300 $cm^3$

**END**

Appendix A-5

# JICA SIIQS Project

## Maths Test for Secondary School Students (Upper Secondary)

Name:_____ _____ _____
First name Middle name Family name

School: _____ Class: _____ Student Number: _____

***** Sample **********

Calculate 2 + 5 =

A. 0 ✓B. 7 C. 10 D. 3

Circle or ✓ here.

Choose only one answer.

**********

1. Multiply : $302 \times 50$

A. 1600 B. 16000 C. 1510 D. 15100

2. Calculate : $4+4 \div 4-4$

A. 0 B. 1 C. 7 D. 8

3. Simplify : 26 – 32 + 43

A. 29 B. 49 C. 37 D. 101

4. Simplify : 23 – (– 42)

A. 29 B. 21 C. -19 D. 65

5. Find the remainder of the following : $489 \div 37$

A. 5 B. 6 C. 7 D. 8

6. Multiply : $-12 \times (-25)$

A. 120 B. –240 C. –300 D. 300

7. Subtract : 2.201 – 0.753

A. 1.448 B. 1.458 C. 1.548 D. 1.558

8. Divide : $24.6 \div 0.04$.

A. 0.615 B. 6.15 C. 61.5 D. 615

9. Multiply 0.203 by 0.56

A. 0.1288 B. 0.01288 C. 0.11368 D. 0.011368

10. Calculate the following : $\frac{3}{8} \div \frac{3}{4}$

A. $\frac{9}{32}$ B. $\frac{1}{2}$ C. $\frac{3}{4}$ D. $-\frac{1}{2}$

11. Simplify : $\frac{3}{4} + \left( \frac{2}{3} \times \frac{1}{4} \right)$

A. $\frac{1}{8}$ B. $\frac{5}{16}$ C. $\frac{5}{6}$ D. $\frac{11}{12}$

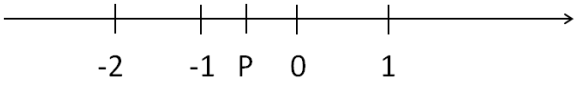
12. Which of the following fractions is the smallest? $\frac{1}{6}, \frac{2}{3}, \frac{1}{3}, \frac{1}{2}$.

A. $\frac{1}{6}$ B. $\frac{2}{3}$ C. $\frac{1}{3}$ D. $\frac{1}{2}$

13. In which list of fractions are all of the fractions equivalent respectively?

A. $\frac{1}{2}, \frac{2}{4}, \frac{4}{6}$ B. $\frac{2}{3}, \frac{4}{6}, \frac{8}{12}$ C. $\frac{2}{5}, \frac{4}{10}, \frac{8}{50}$ D. $\frac{3}{4}, \frac{2}{4}, \frac{4}{6}$ E. $\frac{3}{4}, \frac{4}{6}, \frac{6}{8}$

14. What number does the letter P represent on the number line below?




A. $-\frac{3}{2}$ B. $-\frac{1}{2}$ C. $\frac{1}{2}$ D. $\frac{3}{2}$

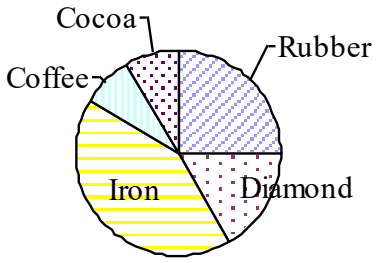
15. 20. If the ratio 7 to 13 is the same as the ratio *x* to 52, what is the value of *x*?

A. 7 B. 13 C. 28 D. 364

16. Change 35% to the simplest fraction.

A. $\frac{7}{2}$ B. $\frac{7}{20}$ C. $\frac{7}{200}$ D. $\frac{7}{2000}$

17. The pie graph below shows the main export of a country. What percentage of the shaded portion of the exports is rubber?




A. 10% B. 15% C. 20% D. 25%

18. If a, b and c are different real numbers, then which of the following is true?

A. $a - b = b - a$

B. $a(b - c) = b(c - a)$

C. $b - c = c - b$

D. $ab = ba$

19. Find the value of $x$, if $12x - 10 = 6x + 32$ .

A. 5 B. 6 C. 7 D. 8

20. An American tourist wants to change $30.00 American dollars to Rwandan francs. How much Rwf will he receive if $1.00 exchanges for 820 Rwf?

A. 246 Rwf B. 2,460 Rwf C. 24,600 Rwf D. 820 Rwf

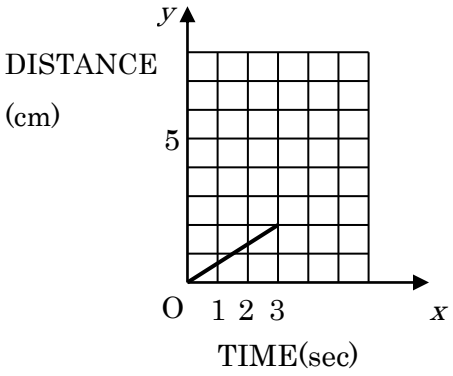
21. If $x$ is proportional to $y$ in the following table, find the value of $p$ and $q$ below.

| $x$ | 3 | 6 | $q$ |
|---|---|---|---|
| $y$ | 7 | $p$ | 35 |

A. $p = 14,\quad q = 31$ B. $p = 10,\quad q = 14$

C. $p = 10,\quad q = 31$ D. $p = 14,\quad q = 15$

22. This graph shows how fast an ant walks along the straight line. If this ant keeps walking at the same speed as ever, what is the distance that this ant walks in 30 seconds?




A. 5cm B. 6cm C. 20cm D. 25cm

23. The table represents a relation between $x$ and $y$. What is the missing number in the table?

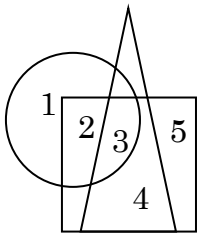
A. 9
B. 10
C. 11
D. 12

| $x$ | $y$ |
|---|---|
| 2 | 5 |
| 3 | 7 |
| 4 | ? |
| 7 | 15 |

24. Calculate $\frac{1}{6}x^2 - \frac{1}{3}x - 1 = 0$

A. $\pm 3$ B. $1 + \sqrt{7}$ C. $1 \pm \sqrt{7}$ D. $1 \pm \sqrt{6}$

25. In the figure below, which number belongs to the square, the circle and not to the triangle?




A. 1

B. 2

C. 3

D. 4

E. 5

26. Which is the smallest number among the following?

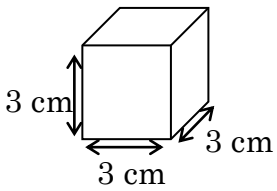
700mm, 6cm, 0.15m, 0.002km

A. 700mm B. 6cm C. 0.15m D. 0.002km

27. Which of the following is equivalent to $\frac{7}{6}\pi$

A. 30° B. 70° C. 120° D. 210°

28. What is the volume of the cube below?



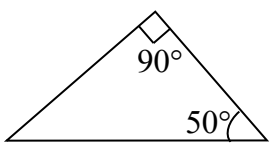

A. 9 $cm^3$

B. 18 $cm^3$

C. 27 $cm^3$

D. 64 $cm^3$

29. What is ∠ABC in the triangle below?



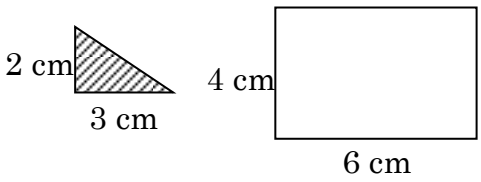

A. 20°

B. 40°

C. 50°

D. 80°

30. How many of the shaded right-angled triangles below are needed to cover exactly the surface of the given rectangle?



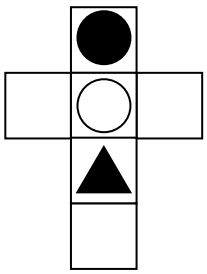

A. Four

B. Six

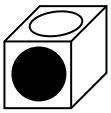
C. Eight

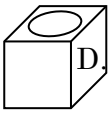
D. Ten

31. Which of the following cubes could be made by folding the figure below?



A.

B. 

C. D. 

32. Find the highest common factor (HCF) and the least common multiple (LCM) of 12 and 18.

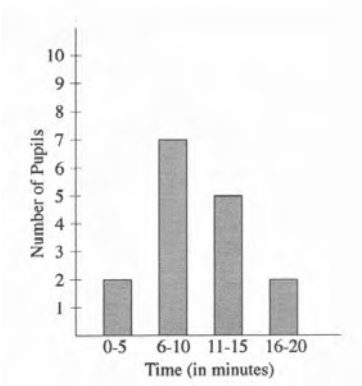
A. HCF = 4, LCM = 36

B. HCF = 6, LCM = 36

C. HCF = 6, LCM = 48

D. HCF = 8, LCM = 48

33. The graph shows the time of travel by students from home to school. How many students must travel for MORE THAN 10 minutes?




A. 2

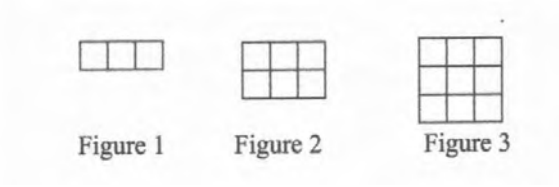
B. 5

C. 7

D. 8

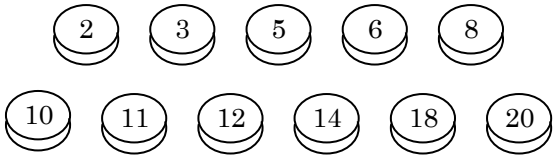
E. 15

34. Here is the beginning of a pattern of tiles. If the pattern continues, how many tiles will be in Figure 6?




A. 12 B. 15 C. 18 D. 36

35. The eleven chips below are placed in a bag and mixed. Emmanuel draws one chip from the bag without looking. What is the probability that Emmanuel draws a chip with a number that is a multiple of three?




A. $\frac{1}{11}$ B. $\frac{1}{3}$ C. $\frac{4}{11}$ D. $\frac{3}{11}$

36. You are given the following sets;

A = {x: x is a multiple of 2 less than 20}, B = {x: x is a multiple of 3 less than 20}

How many elements are there in $A \cap B$?

A. 1 B. 3 C. 6 D. 10

37. Factorise the following : $9x^2 - 25$

A. $(3x + 5)^2$ B. $(3x - 5)^2$ C. $(3x + 5)(3x - 5)$ D. $x(9x - 25)$

38. Two vectors are such that $\boldsymbol{a} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}, \boldsymbol{b} = \begin{pmatrix} 3+k \\ 4+t \end{pmatrix}$.

If $\boldsymbol{a} = \boldsymbol{b}$, find the values of $k$ and $t$.

A. $k = 0, \quad t = 0$ B. $k = -1, \quad t = 1$

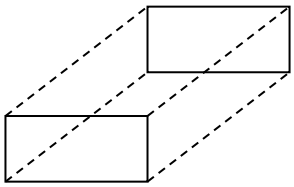
C. $k = 1, \quad t = -1$ D. $k = 4, \quad t = 3$

39. The three sides of a right-angled triangle are x, x+1 and 5. Find x, if the longest side is 5.

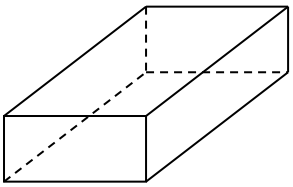
A. x = 5 B. x = -4, 3 C. x = 3 D. x = 1

40. Which of the dotted lines in the shapes drawn below show the hidden edges of the cuboid?

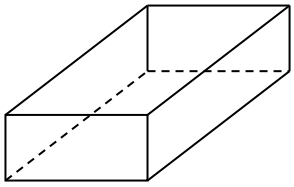
A.



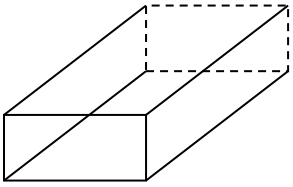
B.



C.



D.



Appendix A-6

# JICA SIIQS Project

## Science Test for Secondary School Students (Upper Secondary)

Name:_____ _____ _____
First name Middle name Family name

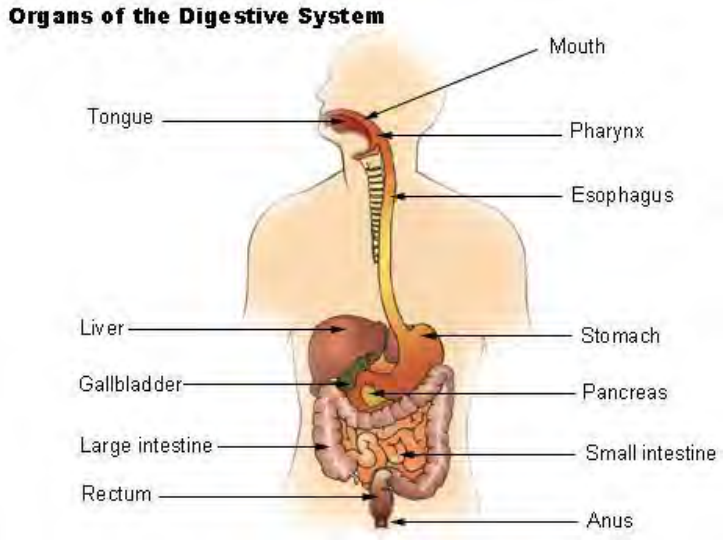
School: _____ Class: _____ Student Number: _____

### PART A

**Circle the letter of the best answer choice from A, B, C and D. (Choose Only ONE Answer)**

***Question 1***

Digestion is the process by which food is broken into simple substances which can be used by the body. It is an important process because it allows the body to get useful nutrients from the food that we eat. In which organ do we absorb important nutrition such as amino acids and glucose?




A. stomach

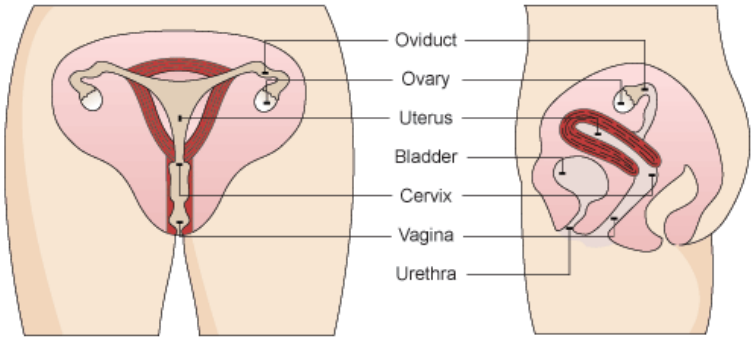
B. small intestine

C. large intestine

D. liver

***Question 2***

The figure below shows the female reproductive system. In which organ does fertilization take place?




A. ovary

B. oviduct

C. uterus

D. cervix

***Question 3***

Which of the following foods is correctly matched to its group?

A. ground nuts → energy giving

B. eggs → protective

C. carrots → energy giving

D. bananas → body building

***Question 4***

Which one of the following is the most effective preventive measure against the spread of sexually transmitted infections amongst the youth in schools?

A. seeking medical attention

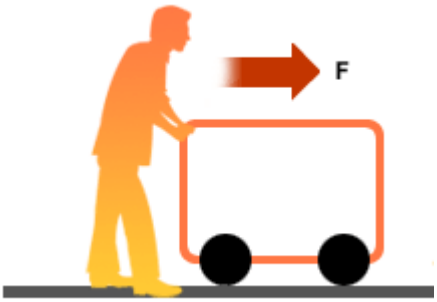
B. use of condoms

C. circumcision

D. taking a shower daily

***Question 5***

A force of 20N pushes a box 5m in the direction of the force. Calculate the work done.




A. 4 N/m

B. 15 Nm

C. 25 Nm

D. 100 Nm

***Question 6***

When suspended freely, a magnet always faces

A. Up-Down direction

B. North-South direction

C. West-East direction

D. Free direction

***Question 7***

Below are some examples of second class levers. Which statement for the second class levers is correct?

A. the load lies in between the effort and the fulcrum.

B. the fulcrum is always between the load and the effort.

C. the effort lies in between the load and the fulcrum.

D. it can be categorized into wheel, screws and gears.

***Question 8***

If you have a mixture of iron filings and sand, how can you separate them?

A. put them in water and boil them to remove sand

B. use magnet to attract iron filings

C. use filter to collect sand only

D. burn them to remove iron filings and cool them down

***Question 9***

Which one of the following consists of only materials that are ALL non-magnetic?

A. aluminium foil, piece of paper

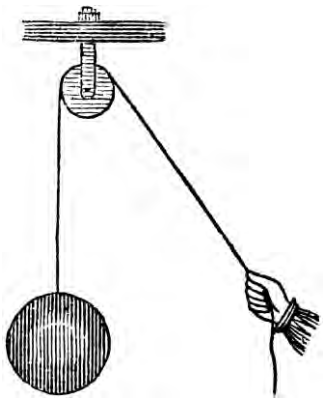
B. iron nails, plastic bottle

C. piece of glass, sewing needle

D. steel wool, water

***Question 10***

Which statement on the single fixed pulley is NOT correct?



A. it is made up of only one pulley which is fixed

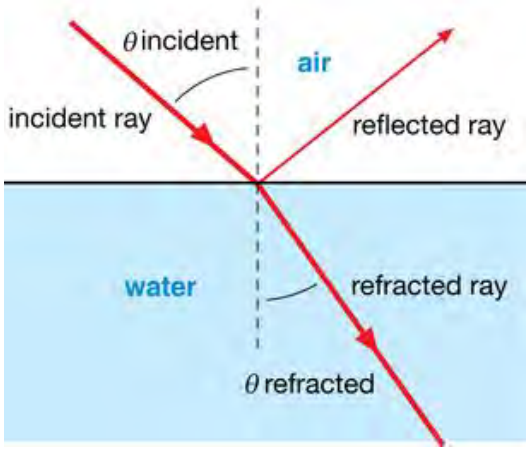
B. it reduces the effort needed and it changes the direction of the force

C. effort distance is equal to the load distance

D. it enables us to raise a load much higher than the person doing it

***Question 11***

Below is the diagram of incident ray, refracted ray and reflected ray at the boundary of air and water. Which statement is correct?




A. angle of incident is equal to angle of refraction

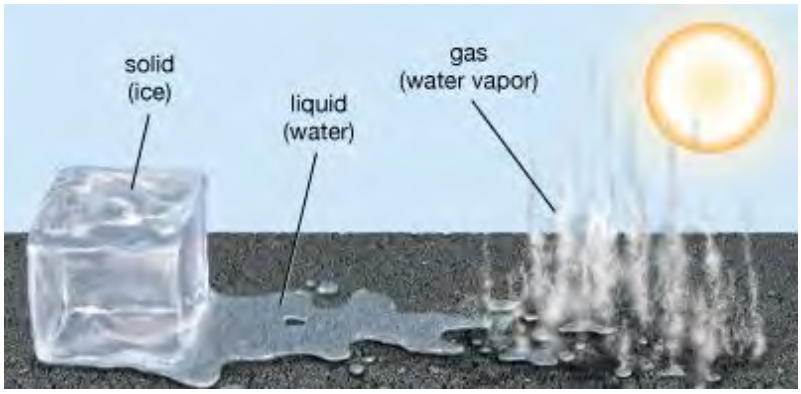
B. angle of incident is bigger than angle of refraction

C. angle of incident is smaller than angle of refraction

D. angle of reflection is equal to angle of refraction

***Question 12***

What do you call the process of the change of the states from gas to liquid?




A. evaporation

B. melting

C. condensation

D. sublimation

***Question 13***

Which statement on the inclined plane is NOT correct?

A. it is also known as a slope

B. the effort required to lift the brick when using an inclined plane is smaller than the effort required without the inclined plane

C. a bigger force is required when using the steep inclined plane, and a smaller force is required when the inclined plane is gentle.

D. it enables us to lift a plank of wood on a inclined plane by reducing the amount of work

End of Part A

## PART B

***Question 1***

Which of the following can provide the human body with long-term immunity against some diseases?

A. antibiotics

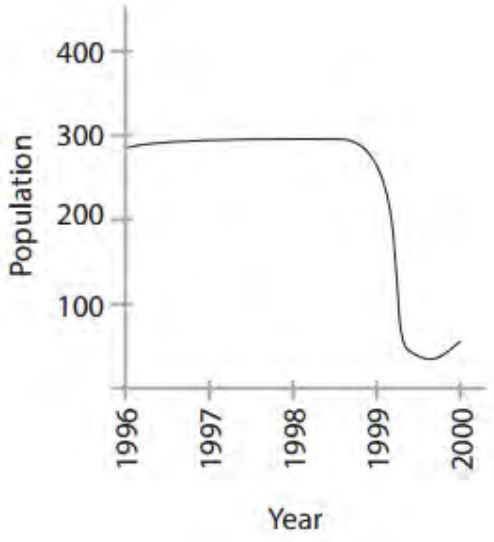
B. vitamins

C. vaccines

D. red blood cells

***Question 2***

The graph indicates the number of antelopes in a certain area over a period of time. Which of the following factors is most likely to have caused the sudden change in population between 1999 and 2000?




A. global warming

B. absence of predators

C. depletion of the ozone layer

D. brush fires that destroyed the food supply

***Question 3***

Bacteria that enter the body are destroyed by which type of cells?

A. white blood cells

B. red blood cells

C. kidney cells

D. lung cells

***Question 4***

Kidneys are organs found in the human body. When he was young, a man had one of his two kidneys removed because it was diseased. He now has a son. How many kidneys did his son have at birth?

A. 0

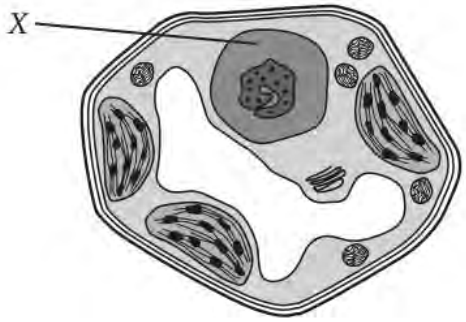
B. 1

C. 2

D. 3

***Question 5***

The diagram shows a plant cell. What is the function of the part of the cell labeled X?




A. It stores water.

B. It makes food.

C. It absorbs energy.

D. It controls activities.

***Question 6***

Which equation summarizes the process of respiration?

A. water + carbon dioxide + energy → sugar + oxygen

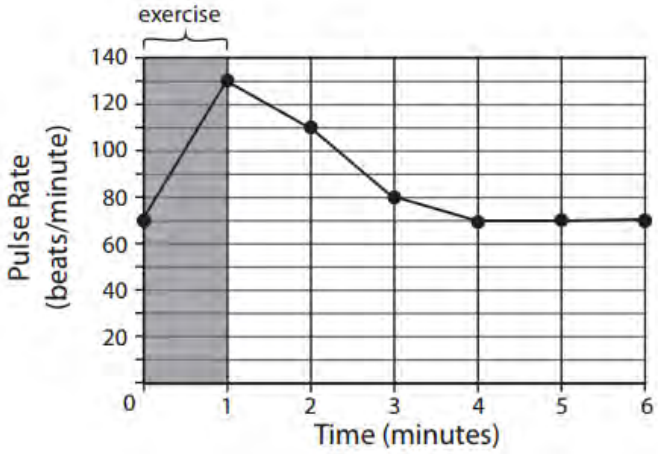
B. oxygen + sugar → carbon dioxide + water + energy

C. carbon dioxide + oxygen + water → sugar + energy

D. sugar + carbon dioxide + energy → oxygen + water

***Question 7***

John measures his pulse rate before he exercises. It is 70 beats per minute. He exercises for one minute and measures his pulse rate again. He then measures it every minute for several minutes. He draws a graph to show his results.




What can be concluded from his results?

A. His pulse rate increased by 50 beats per minute.

B. His pulse rate took less time to slow down than to increase.

C. His pulse rate after 4 minutes was 80 beats per minute.

D. His pulse rate returned to normal in less than 6 minutes.

***Question 8***

Twins are born. One is a boy and one is a girl. Which statement is correct about their genetic makeup?

A. The boy and the girl inherit genetic material from the father only.

B. The boy and girl inherit genetic material from the mother only.

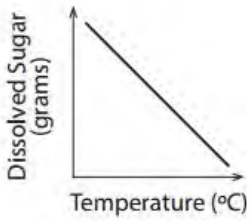
C. The boy and girl inherit genetic material from both parents.

D. The boy inherits genetic material from the father only and the girl inherits it from the mother only

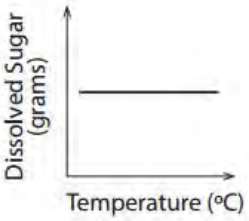
***Question 9***

Bob did an experiment to investigate the effect of temperature on the solubility of sugar in water by measuring the amount of sugar that would dissolve in 1 liter of water at different temperatures. He then plotted his results. Which of the following is likely to be the graph showing Bob's results?

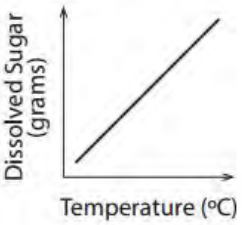
A.



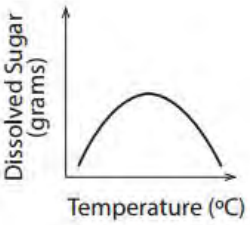

B.




C.

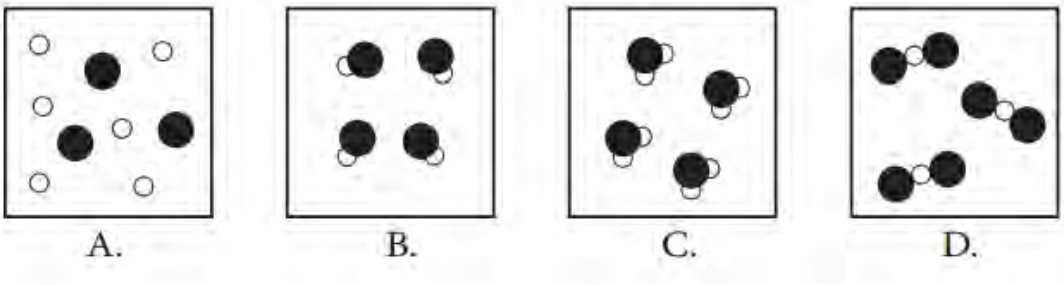



D.




***Question 10***

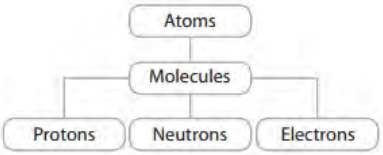
In the diagrams below, hydrogen atoms are represented by white circles, and oxygen atoms are represented by black circles. Which of the diagrams best represents water?



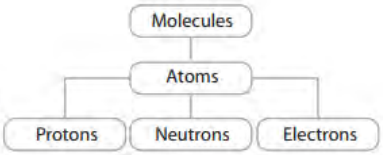

***Question 11***

Which of these diagrams best represents the structure of matter, starting with the more complex particles at the top and ending with the more fundamental particles at the bottom?

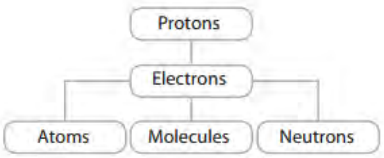
A.



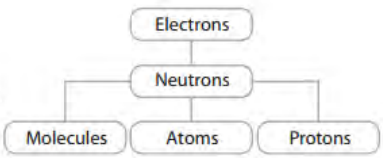

B.




C.




D.



***Question 12***

Some physical properties of five different substances (A, B, C, D, and E) are outlined in the table below.

| | Substance A | Substance B | Substance C | Substance D | Substance E |
|---|---|---|---|---|---|
| Physical state at room temperature (20°C) | Solid | Solid | Liquid | Liquid | Gas |
| Appearance/ colour | Shiny grey | White | Silver | Colourless | Colourless |
| Conducts electricity | Yes | No | Yes | Yes | No |

Which substances are metal?

A. Substance A, B and C

B. Substance A and B

C. Substance C and D

D. Substance A and C

***Question 13***

Which of the following energy conversions takes place in a battery-operated flashlight?

A. electrical → mechanical → light

B. chemical → mechanical → light

C. chemical → electrical → light

D. nuclear → electrical → light

***Question 14***

The figure shows a parachute jumper in four positions.

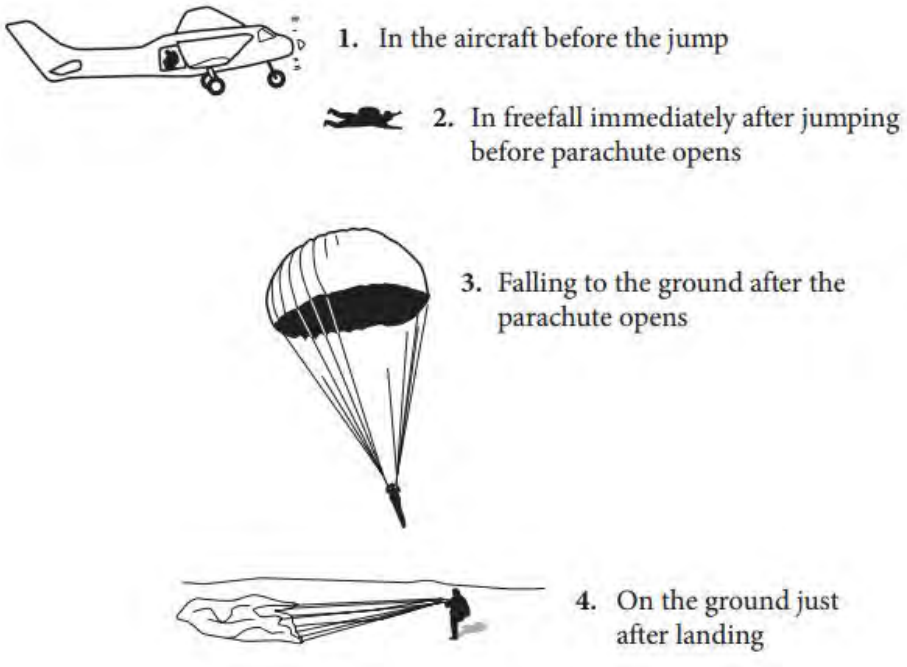
In which of the positions does the force of gravity act on the jumper?

A. Position 2 only.

B. Positions 2 and 3 only.

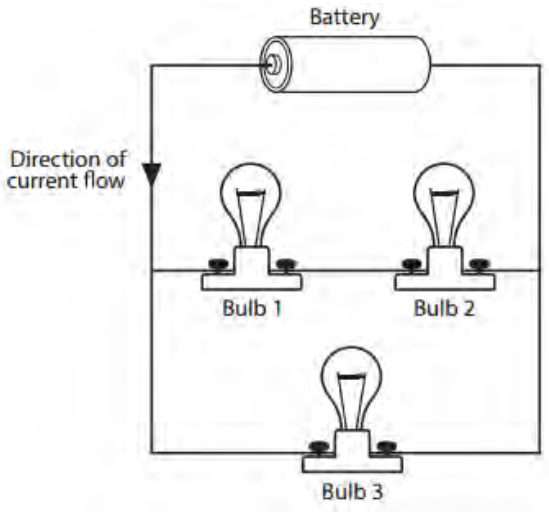
C. Positions 1, 2 and 3 only.

D. Positions 1, 2, 3, and 4.



***Question 15***

Three identical light bulbs are connected to a battery as shown in the diagram. The arrow indicates the direction of the current flow.




Which statement is true?

A. The current in Bulb 1 is greater than the current in Bulb 2.

B. The current in Bulb 1 is greater than the current in Bulb 3.

C. The current in Bulb 2 is the same as the current in Bulb 3.

D. The current in Bulb 2 is the same as the current in Bulb 1.

***Question 16***

A man climbed to the top of a very high mountain. While on the mountain top, he drank all the water in his plastic water bottle and then put the cover back on. When he returned to camp in the valley, he discovered that the empty bottle had collapsed. Which of the following best explains why this happened?

A. The temperature is lower in the valley than on the mountain top.

B. The temperature is higher in the valley than on the mountain top.

C. Air pressure in the valley is lower than on the mountain top.

D. Air pressure in the valley is higher than on the mountain top.

***Question 17***

A student sets up an investigation to test the strength of magnets. He has several magnets of different sizes, shapes, and masses. He uses the magnets to lift metal paper clips. How is the strength of a magnet defined in the investigation?

A. by the mass of the magnet lifting the metal paper clips

B. by the size of the magnet lifting the metal paper clips

C. by the number of metal paper clips lifted by the magnet

D. by the time the metal paper clips stay on the magnet

***Question 18***

Which of the following is the major cause of tides?

A. heating of the oceans by the Sun

B. gravitational pull of the Moon

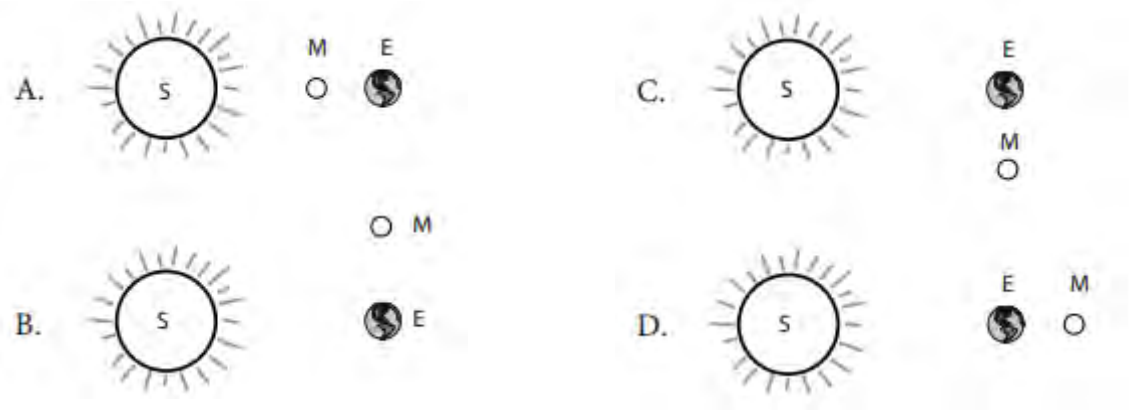
C. earthquakes on the ocean floor

D. changes in wind direction

***Question 19***

Which diagram shows the position of the Sun (S), moon (M), and Earth (E)

during an eclipse of the moon? (Not drawn to scale)




***Question 20***

Which statement is NOT correct on how you can you make use of computer at school or at home?

A. Writing documents

B. Drawing pictures

C. Cooking breakfast

D. Searching information

***Question 21***

How often have you used laptop computers at your school or at home.

A. Almost everyday

B. Once in a week

C. Once in a month

D. Never used

***Question 22***

Calculate the volume of a body with 0.8 g/cm$^3$ and 240g.

A. 192 cm$^3$

B. 239.2 cm$^3$

C. 240.8 cm$^3$

D. 300 cm$^3$

END

# Appendix B
# Questionnaire to School Teachers

# Appendix B

## Questionnaire to School Teachers

This is the questionnaire for the endline survey of the JICA SIIQS Project. The Project aims at strengthening training program for in-service teachers.

## 1. Basic Information

1.1 School Name: _____

1.2 Sector: _____ 1.3 District: _____

1.4 Your Name:_____

1.5 Male or Female: M F 1.6 Age: _____ years old

1.7 Tel: _____ 1.8 E-mail: _____

1.9 Teaching Experience: (a) In this school: _____ years (b) In total: _____ years

1.10 Qualification: A0 / A1 / A2 / Others

1.11 Level of students you are teaching this term (multiple choices are allowed)
P1 / P2 / P3 / P4 / P5/ P6/ S1 / S2 / S3 / S4 / S5/ S6

1.12 Subjects you are teaching this year:_____

1.13 Your department in school: _____

1.14 (a) Are you a School-based Mentor (SBM)? Yes / No
(b) Are you a School Subject Leader (SSL)? Yes / No
(c) Are you a Sector-based Mentor Trainer (SBMT, MT) Yes / No
(d) Are you a Sector-based Trainer (SBT)? Yes / No

1.15 How many periods do you teach **per week** in this term? _____periods/week

## 2. Competence-Based Curriculum (CBC)

2.1 When you prepare lessons, what document(s) do you normally* use? (multiple choices are allowed). **please tell about your ordinally situation in your daily work*

0. None 1. Curriculum booklets 2. Syllabus 3. CBC textbooks authorized by REB
4. Old textbooks (for KBC) 5. Reference books 6. Reference materials (hard copy)
7. Reference materials (soft copy) 8. Information on Internet
9. Others – Please specify: _____

2.2 Please circle the number from 1 to 4 which most fits you.

| | | Strongly disagree | Disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| (a) | I understand the philosophy of CBC. | 1 | 2 | 3 | 4 |
| (b) | I am confident in conducting CBC lessons | 1 | 2 | 3 | 4 |
| (c) | My understanding of CBC has improved since the introduction of CBC. | 1 | 2 | 3 | 4 |

2.3 When you evaluate another teacher's lesson, what point(s) do you observe in particular?

| |
|---|
| |

2.4 Please circle the number from 1 to 4 which most fits your opinion.

| | | Strongly disagree | Disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| (a) | CBC should always include groupwork. | 1 | 2 | 3 | 4 |
| (b) | Lesson conclusion should be given by teacher. | 1 | 2 | 3 | 4 |
| (c) | Blackboard writing should be erased when students solve assessment question at the end of a lesson. | 1 | 2 | 3 | 4 |
| (d) | When a student gives a wrong answer, teacher should call another student to get correct answer immediately. | 1 | 2 | 3 | 4 |
| (e) | When students do not understand a concept, it is because students do not study harder. | 1 | 2 | 3 | 4 |
| (f) | When students do not understand a concept, it is because the teacher did not use effective strategies. | 1 | 2 | 3 | 4 |
| (g) | Teachers should rely on students' oral responses than students' face expressions and behaviors for formative assessment. | 1 | 2 | 3 | 4 |
| (h) | To treat learners equal, teachers should provide the same instruction to all learners regardless of their understanding. | 1 | 2 | 3 | 4 |
| (i) | Calling on students purposefully who make mistakes is good learning opportunities for the class. | 1 | 2 | 3 | 4 |
| (j) | I encourage my students to explain why they reached a certain answer in my class. | 1 | 2 | 3 | 4 |
| (k) | I give students enough time to think before they answer a question. | 1 | 2 | 3 | 4 |
| (l) | I encourage my students to apply their learning to real life situations. | 1 | 2 | 3 | 4 |
| (m) | Good questions should have only one correct answer. | 1 | 2 | 3 | 4 |
| (n) | Students should respond to questions immediately. | 1 | 2 | 3 | 4 |
| (o) | Lesson should introduce one particular and standard solution only. | 1 | 2 | 3 | 4 |

2.5 What challenges do you have in delivering lessons expected in CBC?

## 3. Continuous Professional Development (CPD)

3.1 Does your school have CPD time in your timetable?

0. No 1. Yes (How many periods?) _____ periods

3.2 Does your school conduct CPD regularly?

0. never 1. once a term 2. twice a term 3. three times or more a term

3.3 How frequently do you attend CPD activities at your school?

1. Regularly 2. Sometimes 3. Never 4. We don't have CPD at school.

## 4. Perception on School Management

4.1 Please circle the number from 1 to 5 which most fits your opinion.

| | | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|---|
| 1 | My head teacher is supportive in improving teaching and learning in my school. | 1 | 2 | 3 | 4 | 5 |
| 2 | School-based Mentor (SBM) in my school helps me improve my lesson. | 1 | 2 | 3 | 4 | 5 |
| 3 | School Subject Leader (SSL) in my school helps me improve my lesson. | 1 | 2 | 3 | 4 | 5 |
| 4 | I often receive advice/consultation from my colleagues to improve my teaching. | 1 | 2 | 3 | 4 | 5 |
| 5 | I often give advice/consultation to my colleagues to improve their teaching. | 1 | 2 | 3 | 4 | 5 |
| 6 | I am willing to share my good lesson practice with my colleagues. | 1 | 2 | 3 | 4 | 5 |
| 7 | I use the feedback/advice given by my colleague to improve my teaching and learning process. | 1 | 2 | 3 | 4 | 5 |
| 8 | School activities are proceeded as planned in my school. | 1 | 2 | 3 | 4 | 5 |
| 9 | Results from national examination are analyzed by all teachers together. | 1 | 2 | 3 | 4 | 5 |
| 10 | I usually contact to my students' parents/guardians from my side to talk about students' performance. | 1 | 2 | 3 | 4 | 5 |
| 11 | My students' parents/guardians contact me from their side to talk about students' performance. | 1 | 2 | 3 | 4 | 5 |
| 12 | The vision/mission of my school is/are clearly stated. | 1 | 2 | 3 | 4 | 5 |
| 13 | The vision/mission of my school is shared within school community members. | 1 | 2 | 3 | 4 | 5 |
| 14 | I make my effort to attain the vision/mission of my school. | 1 | 2 | 3 | 4 | 5 |
| 15 | There are clear aims or objectives in my school. | 1 | 2 | 3 | 4 | 5 |
| 16 | The objectives and plans are achieved successfully in my school. | 1 | 2 | 3 | 4 | 5 |
| 17 | Objectives and plans are developed based on evidence and data in my school. | 1 | 2 | 3 | 4 | 5 |

| | | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|---|
| 18 | The school leaders encourage us to give some comments/ ideas to contribute school improvement. | 1 | 2 | 3 | 4 | 5 |
| 19 | There is cooperative system among different subjects in my school. | 1 | 2 | 3 | 4 | 5 |
| 20 | My opinions often contribute to the process of making decision in my school. | 1 | 2 | 3 | 4 | 5 |

Thank you for your cooperation.

# Appendix C
# Questionnaire to Head Teachers

# Appendix C

## Questionnaire to Head Teachers

This is the questionnaire for end line survey for JICA SIIQS Project. The Project aims at strengthening training program for in-service teachers.

## 1. Basic Information

1.1 School Name: _____

1.2 Sector: _____ 1.3 District: _____

1.4 Type of School: Primary / 9YBES / 12YBES / SS

1.5 Type of ownership: Public / Government-aided / Private

1.6 Your Name:_____

1.7 Male or Female: M F 1.8 Age: _____ years old

1.9 Tel: _____ 1.10 E-mail: _____

1.11 Experience: (a) Head teacher: _____ years (b) In total: _____ years

1.12 Qualification: A0 / A1 / A2 / Others

1.13 Number of teachers in your school

| | | Male | Female | Total |
|---|---|---|---|---|
| Primary | Qualified | | | |
| | Non qualified | | | |
| Secondary | Qualified | | | |
| | Non qualified | | | |

1.14 Number of mathematics and science teachers in your school

| | | Male | Female | Total |
|---|---|---|---|---|
| Mathematics | Qualified | | | |
| | Non qualified | | | |
| Science | Qualified | | | |
| | Non qualified | | | |

1.15 Number of students

| Grade | Classes | No of Students | | | No of repeaters | | | No of drop-outs | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Boy | Girl | Total | Boy | Girl | Total | Boy | Girl | Total |
| P1 | | | | | | | | | | |
| P2 | | | | | | | | | | |
| P3 | | | | | | | | | | |
| P4 | | | | | | | | | | |
| P5 | | | | | | | | | | |
| P6 | | | | | | | | | | |
| S1 | | | | | | | | | | |
| S2 | | | | | | | | | | |
| S3 | | | | | | | | | | |
| S4 | | | | | | | | | | |
| S5 | | | | | | | | | | |
| S6 | | | | | | | | | | |
| Total | | | | | | | | | | |

1.16 Do you have the following resources? How many do you have?

| | | | | |
|---|---|---|---|---|
| a. Curriculum book | 1. for all teachers | 2. for some teachers | 3. for few teachers | 4. none |
| b. Syllabus | 1. for all subjects | 2. for some subjects | 3. for few subjects | 4. none |
| c. Textbooks | 1. for all subjects | 2. for some subjects | 3. for few subjects | 4. none |

## 2. Competence-Based Curriculum (CBC)

2.1 To what extent has teachers' practice changed since the introduction of CBC?

0. Not at all 1. Slightly 2. Moderately 3. Very much

2.2 Do teachers have challenges in delivering lessons expected in CBC?

## 3. Continuous Professional Development (CPD)

3.1 Does your school have CPD time in teachers' timetable?

0. No 1. Yes (How many periods?) _____ periods

3.2 How frequently does your school conduct CPD?

0. never 1. once a term 2. twice a term 3. three times or more a term

3.3 Do all teachers in your school attend CPD?

1. Yes, all of them attend.
2. Yes, most of them attend.
3. Yes, a few of them attend.
4. We don't conduct CPD at school.

3.4 What support do you give to promote CPD in your school?

| |
|---|
| |

3.5 Please evaluate CPD at your school. (Tick one per row)

| | Very poor | Poor | Good | Excellent | Not applicable |
|---|---|---|---|---|---|
| Preparation | | | | | |
| Active participation of teachers | | | | | |
| Trainer/Facilitator's skills | | | | | |
| Time management | | | | | |
| Facilities | | | | | |
| Materials | | | | | |

3.6 If your school have conducted CPD in this term, please specify the theme/topic.

| |
|---|
| |

3.7 If your school did not conduct CPD in this term, please specify the reason.

| |
|---|
| |

# Appendix D
# Interview Record Sheet
# for Semi-Structured Interview
# for Group of Teachers

# Appendix D

**Interview Record Sheet for Semi-Structured Interview for Group of *Teachers***

| | |
|---|---|
| **Date** | |
| **School Name** | |
| **Type of School (Circle one)** | Primary 9YBES 12YBES SS |
| **Name of the Interviewer** | |
| **Name of the Recorder** | |
| **Number of Participants** | |

**Topic 1: Implementation of CBC**

**(1) Do you think you understand CBC well and you are able to teach in the way expected in CBC? What are the important components/elements of CBC? How is CBC different from previous Curriculum (KBC)? Assessing your current teaching against CBC you have defined above, what marks out of 100 do you give to your teaching? Why?**

**(2) Do you think you have changed the way you teach since the introduction of CBC? What are the major changes/differences in your teaching before and after the introduction of CBC?**

**(3) What made such changes happen? (CBC training, CPD activities at school, etc.?)**

**(4) What are the major problems on implementation of CBC (Particularly in math and science)?**

**Topic 2: CPD**

**(1) Does your school conduct CPD? If yes, what kind of activities do you do? If not, what is the reason?**

If yes:

- Is CPD time fixed? If yes, when and how often (day of the week/month, time duration)?
- Who facilitates the CPD meetings?
- What do you do in CPD meetings? What was the topic of the most recent CPD?
- Do you use any materials?
- Do you keep record of CPD meetings? (If yes, a photo is appreciated)

**(2) Are there any challenges in conducting CPD? Do you think CPD is sustainable in your school?**

# Appendix E
# Interview Record Sheet
# for Semi-Structured Interview
# for Head Teachers

# Appendix E

**Interview Record Sheet for Semi-Structured Interview for *HT***

| | |
|---|---|
| **Date** | |
| **School Name** | |
| **Type of School (Circle one)** | Primary 9YBES 12YBES SS |
| **Name of the Interviewer** | |
| **Name of the Recorder** | |

**Topic 1: Implementation of CBC**

**(1) What changes have you found in the way teachers teach since the introduction of CBC? Do you think teachers have delivered lessons as expected in CBC?**

**(2) What are the major problems on implementation of CBC at your school (Particularly in math and science)?**

**Topic 2: CPD**

**(1) Does your school conduct CPD? If yes, what kind of activities do teachers do? If not, what is the reason?**

If yes:

- Is CPD time fixed? If yes, when and how often (day of the week/month, time duration)?
- Who facilitates the CPD meetings?
- What do you do in CPD meetings? What was the topic of the most recent CPD?
- Do you use any materials?
- Do you keep record of CPD meetings? (If yes, a photo is appreciated)

**(2) Do you participate in CPD meetings? In what way do you support CPD?**

**(3) What do you think is your role as HT to promote CPD? Is it easy or difficult to perform?**

**(4) Do you think CPD is effective in improving teaching and learning? Do you think CPD is sustainable in your school? Why do you think so?**

**(5) Are there any challenges in conducting CPD? Have you ever reported the challenges to SEO to solve?**

# Appendix F
# Interview Record Sheet
# for Semi-Structured Interview
# for SCCs of sectors
# where model schools are located

# Appendix F

**Interview Record Sheet for Semi-Structured Interview for SCCs of sectors where model schools are located**

| | |
|---|---|
| **Date** | |
| **District/Sector** | District: Sector: |
| **Interviewee's Name** | |
| **Position** | |
| **Name of the Interviewer** | |
| **Name of the Recorder** | |

**(1) Is the SCC established in this sector? Do you have SCC plan? (check if it is available), What is the main objective? Who participated in the development of SCC plan? Did you refer to DCC plan when making SCC plan?**

| |
|---|
| |

**(2) How frequently do SCC member meet? Who organizes the meeting? who chair the meeting? Who attended Do you make meeting minutes? (check if they are filed if yes)**

| |
|---|
| |

**(3) From the last SCC meeting, what are the key action points taken? Are those action points being implemented? Who is making the follow up? What have been achieved so far?**

| |
|---|
| |

**(4) What are issues/ or challenges resolved through SCC meeting and or activities**

**(5) Does SCC plan and organize CPD activities? If so, what kind of activities does it organize?**

**(6) In what way does SCC monitor and review CPD activities taking place at each school? (ex. School visit, review of CPD report submitted by schools) Do you provide advice/recommendation for HTs?**

**(7) Your sector is one of sectors having JICA's model schools where Lesson Study has been piloted.... Was lesson study helpful in improving teaching practices in the model school? Do you have a plan to disseminate it in other schools as well?**

**(8) What are the measures to sustain Lesson Study program?**

**(9) Do you have any SCC good practices in your sector to share?**

**(10) How does your SCC collaborate with DCC? Is there any communication /reporting channel between DCC and SCC? In what way, can it be improved?**

**(11) What support do you need to effectively implement SCC activities? What are the suggestion for improvement? (What is needed to make SCC more active?)**

# Appendix G
# Lesson Plans Developed in Lesson Study

G-1: EP Buhande P5 math

G-2: Mukarange Catholique P5 math

G-3: EP Buhande P5 SET

G-4: GS Mukarange Catholique P5 SET

G-5: GS Mukarange Catholique S2 math

G-6: GS APAGIE Musha S2 math

G-7: GS Mukarange Catholique S2 biology

G-8: GS APAGIE Musha S2 biology

G-9: GS APAGIE Musha S5 math

G-10: GS NDA Rwaza S5 math

G-11: GS APAGIE Musha S4 chemistry

G-12: GS NDA Rwaza S4 chemistry

# Appendix G-1

**LESSON PLAN**

**School name:** BUHANDE primary school **Teacher's name**. Ujeneza Seraphine

| Term | Date | Subject | Class | Unit N° | Lesson N° | Duration | Class size |
|---|---|---|---|---|---|---|---|
| II | 12-06-2019 | Math | P5A | 7 | 3 out of 3 | 40 min | 45 |

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|---|---|
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | |
| **Unit title** | Solving problems involving measurements of lengths, capacity, and mass |
| **Key Unit Competence** | To be able to solve problems involving measurements of length, learners will be able to calculate the number of intervals |
| **Title of the lesson** | Finding of intervals on a closed line |
| **Instructional Objective** | By using a chalkboard, pieces of chalk, ruler, tape measure and stones, learners will be able to calculate the number of intervals on a closed line confidently in a given time |
| **Plan for this Class (location: in / outside)** | Inside and outside |
| **Learning Materials (for all learners)** | Chalkboard, pieces of chalk, ruler, tape measure, stones, and manila paper |
| **References** | Mathematics for Rwanda schools textbook p 118-119, teacher's guide p 162-163 |

| **Timing for each step** | | **Description of teaching/learning activities** | | **Generic competences** and **rule. issues** to be addressed + **a short explanation** |
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| | | Organizing a class, introducing the lesson, giving instruction, guiding learners outside, presenting teaching aids, discuss the activity done, finding out the…….. | | |
| | | **Teacher's activities** | **Learner's activities** | |
| **1. Introduction (5min)** | | Ask questions about the previous lesson<br><br>A road is 2km long, trees were planted 2m apart from one side of the road an interval of 2m was left at one end without a tree due to an existing shop, how many trees were planted along the road? | Answering questions<br><br>Distance; 8km<br>Interval length; 2m<br>Number of trees=2km/2m<br>=2000m/2m<br>=1000 trees | Critical thinking developed through answering question |
| **Development of the lesson (30 min)** | **2.1 discovery activities (10 min)** | Giving instructions<br>Going out politely without documents<br>Presenting teaching aids<br>- ruler<br>- stones<br>- tape measure<br><br>Grouping learners in 4 groups<br>Giving tasks | Follow instructions<br><br>Observing teaching and learning materials<br><br>Joining their groups<br>Doing tasks<br>- two groups draw and measure square<br>- other two groups draw and measured the rectangle | Communication developed through working together in their groups |

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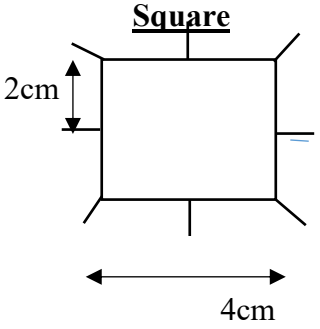
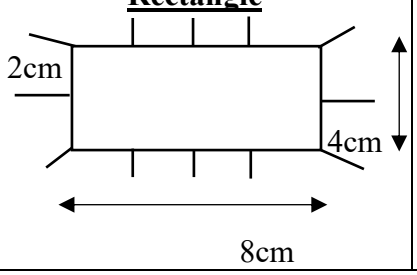
| | | | - they fix the poles<br>- they record and measure the intervals found on the drawings | |
| | **2.2 presentation learners' findings production (10 min)** | Ask questions related to what they have done<br>- What types of lines do we have?<br>- How long is the distance for squares?<br>- How long is one length?<br><br><br><br>- How many intervals were left for square?<br>- How many were left for a rectangle?<br><br>- By considering the length of distance and length of one interval how can we calculate the number of interval on a closed line? | Answering question<br><br>Closed line<br><br>Distance for square is 16m<br><br>Distance for the rectangle is 24m<br>One interval is 2m<br><br>8 intervals<br><br>12 intervals<br><br><br>Number of intervals on a closed line = distance divide by interval length | Gender enhance through measuring question both girls and boys |
| | **2.3 exploitation findings production (5 min)** | Tell pupils to enter a classroom<br><br>Ask questions about what we have studied outside<br><br>Presenting manila paper where written square<br><br><br><br><br><br>Ask questions about drawing<br>- Is that figure open or closed?<br><br>- What is its distance?<br>- How long is one interval?<br>- How many intervals and poles are there?<br><br>Presenting manila paper where written rectangle | <br><br><br>Answering questions<br>Number of intervals on a closed line<br>**Square**<br>  <br><br>Closed<br><br>16m<br>2cm<br>8 intervals and 8 poles<br><br>**Rectangle**<br>  <br> | Communication developed through answering questions |

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| | | Ask questions about the rectangle<br>- How is the distance?<br>- How long is one interval?<br>- How many intervals are there?<br>- Finding the number of poles are there | Distance = 24cm<br>One interval = 2cm<br><br>They are 12 poles | |
| | **2.4 conclusion/ summary (5min)** | Taking summary with learners | Taking notes<br>On every closed line or field<br>Number of intervals =number of poles<br><br>Distance =number of intervals x interval length<br><br>Number of intervals =distance divide by interval length | Communication through answering the asked question |
| **3. assessment (5min)** | | Giving individual activity for evaluation | Answering in their exercises notebook<br><br>- In a town, a square plot has sides of 50m. Poles were fixed to fence it at intervals of 2m, how many poles were used?<br>- How many intervals were left there?<br><br>Side = 50m<br>Distance= 50 x 4 = 200<br>Interval length = 2m<br><br>Number of poles<br>= distance/length of interval<br>Number of poles = 200m/2m<br><br>They are used 100 poles<br>They left 100 intervals | Critical thinking developed<br>Through think and answer the asked question |
| **Observation of lesson** | | | | |

# Appendix G-2

**LESSON PLAN**

**School name: G.S Mukarange Catholique** **Teacher's name**. Mukankwaya Beata

| Term | Date | Subject | Class | Unit N° | Lesson N° | Duration | Class size |
|---|---|---|---|---|---|---|---|
| II | 10-06-2019 | Maths | P5B | 5 | 3 of 8 | 40 min | 68 |
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | | | | | | | |
| **Unit title** | Multiplication and division of decimal numbers | | | | | | |
| **Key Unit Competence** | To be able to multiply, divide, and compare decimal numbers up to 3 decimal places | | | | | | |
| **Title of the lesson** | Comparing decimal numbers | | | | | | |
| **Instructional Objective** | By using a number line and decimal place, the learners should be able to compare 2 or more decimal number <,>, or = correctly | | | | | | |
| **Plan for this Class (location: in / outside)** | In this class by sitting in a u-shaped arrangement | | | | | | |
| **Learning Materials (for all learners)** | Place value chart, chalk board, comparison, terms in manila paper | | | | | | |
| **References** | Mathematics for Rwandan primary school, pupils book page 91-92 | | | | | | |

| **Timing for each step** | **Description of teaching/learning activities** | | **Generic competences** and **Cross-cutting issues** to be addressed + **a short explanation** |
|---|---|---|---|
| | Using place values, in group or individual, learners should be asked to discover the difference between 2 or more different decimal numbers and then compare decimal numbers up to 3 decimal places using >, <, or =. | | |
| | **Teacher's activities** | **Learner's activities** | |
| **1. Introduction (10min)** | Greeting and asking questions which are revising what the learners learn to decimal numbers.<br>Q1) Present the place value of the digit 3.<br><br>a)0.023<br><br>b)35.964<br><br>c)925.37<br><br>d)4.034 | Greeting and answering questions asked by their teacher.<br><br>Answer<br><br>a)0.023, the place value of 3 is thousandths.<br>b)35.964, the place value of is tens.<br>c)925.37, the place value of 3 is tenths.<br>d)4.034, the place value of 3 is hundredths. | Communication is developed<br><br>And, answering questions |
| | | | |
| **2. Development of the lesson (20 min)** | - Asking the individual learner to compare decimal numbers Looking around the students who are struggling and note their mistake and errors | - Answering questions | -gender<br><br>-cooperation<br><br>-communication |

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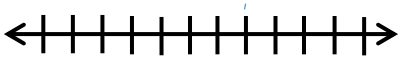
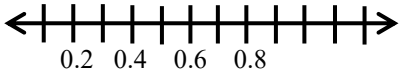
| | - Arrange groups based on the observation (mixing slower and good performers to repeat the activity)<br>- Record time for activity<br><br>Q1) Use <,> or =, to fill the blanks.<br>a) 0.005 … 0.007<br>b) 0.9…… 0.8<br>c) 0.77……0.770<br>d) 3.40…....3.040<br><br>Q2) Asks learners to copy and complete the number line below.<br>  <br><br>- Checks the progress of slow learners understanding in group | - Forming groups and do questions<br><br>Answer<br><br>a) 0.005 < 0.007<br>b) 0.9 > 0.8<br>c) 0.77 = 0.770<br>d) 3.40 > 3.040<br><br>Copy and complete the number line<br>  <br><br><br>Helping each other | -critical thinking |
| **3. conclusion/ summary (10min)** | Together with learners, summarizes the lesson and gives them the homework. | Summarizes the lesson and copy the homework to the exercises book. | Problem-solving |
| **Observation on lesson delivery** (to be completed by the teacher) | | | |

# Appendix G-3

## LESSON PLAN

**School Name**: EP Buhande **Teacher's name**: Mwiseneza Bernard

| Term | Date | Subject | Class | Unit Nº | Lesson Nº | Duration | Class size |
|---|---|---|---|---|---|---|---|
| II | 13/06/2019 | SET | P5A | 9 | 6 of 8 | 40min | 46 |
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | | | | Take care of slow learners | | | |
| **Unit title** | Soil | | | | | | |
| **Key Unit Competence** | To be able to prepare soil cultivation and use of fertilizers | | | | | | |
| **Title of the lesson** | Importance of fertilizers | | | | | | |
| **Instructional Objective** | By observing various plants such as beans and sorghum, learners Primary 5 will be able to give importance of fertilizers in a given time | | | | | | |
| **Plan for this Class (location: in / outside)** | In classroom | | | | | | |
| **Learning Materials (for all learners)** | Beans, sorghum, sweet potatoes, cabbage, soil | | | | | | |
| **References** | Pupils book, page 205 | | | | | | |

| **Timing for each step** | **Description of teaching/learning activities** | | |
|---|---|---|---|
| | With various teaching aids (plants) learners will understand the importance of fertilizers with respective size and colour. | | **Generic competences** and **Cross-cutting issues** to be addressed + **a short explanation** |
| | **Teacher's activities** | **Learner's activities** | |
| **1. Introduction (5min)** | Asking questions about the previous lesson<br>- What did we study last time?<br><br>- What are the steps of soil preparation of cultivation?<br><br><br>- Give two types of fertilizers. | Answering questions<br><br>- Fertilization<br><br><br>- Land clearing<br>- Primary cultivation<br>- Secondary cultivation<br>- Leveling soil<br><br>- Organic fertilizer<br>- Chemical fertilizer | - Communication through answering questions |

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| **2. Development of the lesson (22min)**<br><br>**2.1 Discovery activities (2min)** | Presenting plants: beans, sorghum and asking questions about size and color<br><br>- Why do you think the plants are different in color and size?<br><br>- Is it important to use fertilizers?<br><br>- What is the importance of fertilizer?<br><br>Grouping learners in 7 groups and give them a task for each group<br><br>Distributing teaching aids and guide learners.<br>Group 1<br>Group 2<br>Group 3<br>Group 4<br>Group 5<br>Group 6<br>Group 7 | Observing<br>Answering questions:<br><br>Some plant grows on the land where fertilizer was not used and others grow on the land where fertilizer was added<br><br>Yes<br><br>????<br><br>Sitting in groups<br>Discuss in groups<br><br>Discuss soil<br>Discuss leaves' color<br>Discuss plant size<br>Discuss holes on the leaves<br>Discuss production<br>Discuss size<br>Discuss about color | - Communication developed through discussion |
| **2.2 Presentation learners' findings production (…min)** | Guiding learners discussion<br>Rewarding learners | Presenting their findings from Group 1 to 7<br>Follow the presentation | - Gender balance by the presenter both girls and boys<br>- Communication developed through presentation |
| **2.3 Exploitation findings production (…min)** | Ask presenter according to what he/she presented and asking also members of the group<br><br>Rewarding good answer and disagree to a false answer<br><br>Writing the best answers on the blackboard | Answering<br>Follow the teacher explanation<br><br>- It improves soil fertility<br>- It provides nutrition to plants<br>- It improves the growth of plants<br>- It increases agricultural fertility<br>- It increases productivity | - Environment and sustainability by giving importance of fertilizers |

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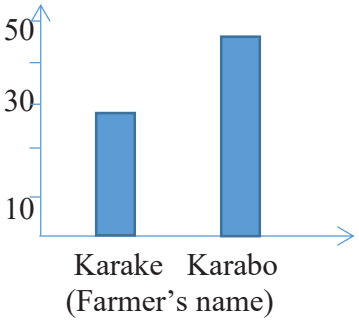
| **2.4 Conclusion/ summary (5min)** | Asking the learners to read the importance of fertilizers<br><br>Help the learners by repetition<br><br>Request learners to write notes | - Reading<br><br>- Repeating<br><br>- Writing notes in their notebook | - Communication |
| **3. Assessment (5min)** | Asking questions individually<br><br>1. Amount of potato harvested (in Kg)<br>  <br><br>a) Which farm did use fertilizer properly?<br><br>b) Why?<br><br>c) What Karake do to increase his production?<br><br>2. What did happen to the cabbage A?<br>A. B.<br> | Learners perform test individually<br><br>a) Karabo<br><br>b) She harvested more potatoes than Karake<br><br>c) Uses fertilizers<br><br>2. No fertilizers added | - Critical thinking through answering questions |
| **Observation on lesson delivery** | | | |

# Appendix G-4

## LESSON PLAN

**School Name:** G.S MUKARANGE CATHOLIQUE **Teacher's Name:** Gasana Jean Pierre

| **Term** | **Date** | **Subject** | **Class** | **Unit N$^{O}$** | **Lesson N$^{O}$** | **Duration** | **Class size** |
|---|---|---|---|---|---|---|---|
| II | 10/06/2019 | SET | P5C | 9 | 4 of 7 | 40min | 55 |
| **Type of special education needs to be catered for in this lesson and the number of learners in each category** | | | | - | | | |
| **Unit title** | Soil | | | | | | |
| **Key Unit competence** | To be able to prepare the soil for cultivation and use fertilizers | | | | | | |
| **Title of the lesson** | Rules for applying Fertilisers | | | | | | |
| **Instructional objectives** | By using gloves, fertile soil, moist soil, bottle cover of Fanta, and dry soil, learners will be able to identify the rules of applying fertilizers correctly. | | | | | | |
| **Plan for this class( location in or outside)** | Inside the classroom, learners sit in U-shape | | | | | | |
| **Learning Materials( for all learners)** | Gloves, moist soil, artificial fertilizers, fertile soil, dry soil, bottle cover of Fanta | | | | | | |
| **References** | Science and elementary technology for Rwandan school | | | | | | |
| **Timing for each step** | **Description of teaching and learning activity**<br>Inside the class, by using gloves and individual work, learners will perform activity provided by the teacher. | | | | | | **Generic competence** and **crosscutting issues** to be addressed<br>+<br>**a short explanation** |
| | **Teacher activities** | | **Learner activities** | | | | |
| **1. Introduction (5min)** | To greet learners and show class rules.<br><br>Ask learners in the previous lesson:<br>"What is the importance of fertilizer?" | | Greet teacher and read class rules<br><br>Learners answer the teacher' questions.<br>*Expected answers:*<br>- It provides the nutrients to the plants<br>- It increases agriculture productivity | | | | Communication skills<br>Operation |
| **2. Development of the lesson (30min)**<br><br>**2.1 discovery activities (5min)** | Invite the learners to observe carefully the teaching aids and discuss the rules of applying fertilizers. | | Learners in their groups, observe teaching aids and discuss the rules of applying fertilizers. | | | | Cooperation<br>Critical thinking |

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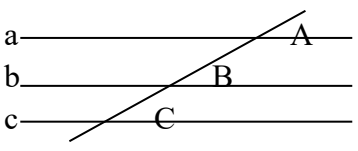
| | Ask the learners to present their findings on the rules of applying fertilizers. | Learners present their findings.<br>*Expected findings:*<br>- Respect the dose<br>- Wear the gloves when handling fertilizers<br>- Apply fertilizers in the moist soil<br>- Use organic fertilizers before inorganic fertilizers | Communication skills and Gender education |
| **2.2 presentation learners' findings production (10min)** | To remark learners findings. | Learners follow the teacher's remarks on the chalkboard. | Communication |
| **2.3 exploitation findings production (10min)** | To summarize the lesson. Teacher gives short notes about the lesson to the learners. | Learners take notes about the rules of applying fertilizers. | Cooperation Gender |
| **2.4 conclusion/ summary (5min)** | Teacher ask the learners about the lesson<br>1) list down 2 rules of applying fertilizers<br>2) list down 2 steps of using fertilizers | Learners answer the questions asked.<br>The rules for applying fertilizers are:<br>- Respect the dose<br>- Wear the gloves<br>- Apply fertilizers in the moist soil | Cooperation Gender |
| **3. assessment (5min)** | | | |
| **Observation on lesson delivery** (to be completed by the teacher) | | | |

# Appendix G-5

**LESSON PLAN**

**School Name**: G.S Mukarange Catholic **Teacher's Name**: Umugwaneza Jeanne Françoise

| **Term** | **Date** | **Subject** | **Class** | **Unit N$^0$** | **Lesson N$^0$** | **Duration** | **Class Size** |
|---|---|---|---|---|---|---|---|
| II | 12/6/2019 | Math | S2c | 5 | 3 out of 6 | 80 min | 71 |
| **Types of special educational needs to be catered for in this lesson and the number of learners in each category** | | | | | None | | |
| **Unit title** | Thales' Theorem | | | | | | |
| **Key unit competence** | Use Thales' theorem to solve problems related to similar shapes and determine their lengths and areas | | | | | | |
| **Title of the lesson** | Midpoint theorem | | | | | | |
| **Instruction objective** | By using a pencil, a ruler and T-square learner will be able to apply midpoint theorem to determine the lengths of the triangle accurately. | | | | | | |
| **Plan for this class (location in /outside)** | In classroom, learners are sitting in U-form | | | | | | |
| **Learning materials (for all learners)** | Exercise book, pencil, pen, and geometrical instruments | | | | | | |
| **References** | Ordinary level mathematics for Rwandan school learner's book 2 | | | | | | |

| **Timing for each step** | **Description of teaching and learning activity** | | **Generic competences** and **Cross-cutting issues** to be addressed+ **a short explanation** |
|---|---|---|---|
| | The lesson takes place inside the class by using individual and group work as learner-centered approach method | | |
| | **Teacher's activities** | **Learner's activities** | |
| **Introduction 10 min** | 1. Ask the learners to remind us of the previous lesson.<br>2. I will assess the prior knowledge<br>- parallel line<br>- transversal line<br>3. Ask the learners to draw three parallel lines and a transversal line on their exercise book.<br>4. What are the necessary conditions for parallel lines to be equidistant? | - Remind us the previous lesson intercept theorem.<br>- Learner draws parallel lines and transversal lines.<br>  | - Critical thinking is developed by drawing a parallel line. |

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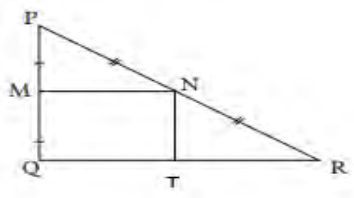
| **Development of the lesson**<br>STEP 1: 10 min<br>STEP 2: 30 min<br><br><br><br><br>STEP 3: 15min | - Ask the learners to form the groups by counting<br>- Request learners to do an activity<br><br>A) Given the triangles of different measure, mark M, the midpoint of PQ .<br><br><br><br>B) What can you say about PM and MQ?<br>C) Draw MN parallel to QR meeting PR at N.<br>D) What can you say about PN and NR?<br>E) Comment on the triangles PMN and QPR.<br>F) Let T be the midpoint of QR, what can you say about NT and PQ.<br>G) Name the figure QTNM and give reasons why.<br><br>H) Comment on MN and QT and on MN and QR.<br><br>I) From the result in (h), what can you deduce about NT and PQ, MT and PR?<br>J) Differentiate the functions of midpoint theorem in real life.<br><br>- Allow the learners to represent their work on the chalkboard. | - Form the group<br><br>- Do an activity given in their respective e groups<br><br>  <br><br>B)PM=MQ<br><br><br><br>D)PN=NR<br><br>E) The triangle PMN and QPR are similar.<br>F) NT=$\frac{1}{2}$PQ<br><br>G) Parallelogram, because opposite sides are parallel and equal.<br>H) MN=QT and MN=$\frac{1}{2}$QR<br>NT=$\frac{1}{2}PQ$ and MT=$\frac{1}{2}PR$<br><br><br>J) Learners apply midpoint theorem in real life.<br><br>- They represent their work. | - Cooperation<br>- Self-confidence<br>- Critical thinking<br><br>- Gender education is addressed by giving equal opportunity to boys and girls.<br>- Environment and sustainability are addressed by applying midpoint theorem in real life. |
| **Conclusion**<br>**15 min** | - Give the summary to the learners and write exercise on the chalkboard.<br>- Allow the learner on the chalkboard to answer the question 6 page no 136. | Learners correct some mistakes and do exercise on a chalkboard<br>AC=$\frac{1}{2}$, QR=5cm, AB=$\frac{1}{2}$<br>PR=5.5cm<br>BC=$\frac{1}{2}$, PQ=4.5cm | **Critical thinking is developed by doing exercise.** |
| **Teacher's self evaluation** | | | |

# Appendix G-6

**LESSON PLAN**

**School name: G.S APAGIE MUSHA.** **Teacher's name**. Mulondari Wasso

| Term | Date | Subject | Class | Unit N° | Lesson N° | Duration | Class size |
|---|---|---|---|---|---|---|---|
| 2 | 22 /6/ 2018 | Math | S2A | 5 | 1 of 3 | 80 min | ……. |
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | | | | | | | |
| **Unit title** | Thales theorem | | | | | | |
| **Key Unit Competence** | Use Thales theorem to solve problems related to similar shapes and determine their lengths and areas | | | | | | |
| **Title of the lesson** | Midpoint theorem in a triangle | | | | | | |
| **Instructional Objective** | Using a ball pen and a sheet of paper learners should be able to find the lengths of a side of the triangle gives the length of a segment joining midpoint of two sides and vice versa | | | | | | |
| **Plan for this Class (location: in / outside)** | Inside and outside the class | | | | | | |
| **Learning Materials (for all learners)** | Ball pen, a sheet of paper, a ruler, protector, compass, chalk, and blackboard | | | | | | |
| **References** | Mathematics for Rwanda schools S2 | | | | | | |

| **Timing for each step** | **Description of teaching/learning activities** | | **Generic competences** and **Cross-cutting issues** to be addressed + **a short explanation** |
|---|---|---|---|
| | To determine the lengths of a side given the lengths of a segment joining, midpoints of other sides and vice versa | | |
| | **Teacher's activities** | **Learner's activities** | |
| **1. Introduction (10min)** | To ask questions about the midpoint of a line segment, similar triangles, and parallel by a triangle line. | To answers to questions about the midpoint, similar triangles, and parallel cut by a triangle line. | Critical thinking through remembering previous lesson and communication |
| **2. Development of the lesson (40 min)** — **2.1 discovery activities (20min)** | To ask learners to form group works.<br><br>To provide the manila paper with activity contained clear instructions on midpoint and parallel segment.<br><br>Guide learners in groups. | Learners form group works.<br><br>Learners work in groups using textbooks on the given activity to discover the Thales midpoint theorem. | Inclusive education based on gender balance and special educational needs<br><br>Communication through discussion, Cooperation through interacting research through given activity |
| **2. Development of the lesson (40 min)** — **2.2 presentation learners' findings production (10 min)** | To ask learners, randomly to present and share findings of his/her group work | The chosen learner presents and shares with the class the group findings | Communication through the presentation , lifelong learning, promotes skill development of higher-order thinking skills in how group members assist representative |

| | | | | |
|---|---|---|---|---|
| | **2.3 exploitation findings production (10 min)** | Ask learners to evaluate the findings of other groups and guide them in order to get the statement of Thales midpoint theorem. | Give comments on the evaluation.<br>Follow comments of other learners and of the teacher.<br><br>Ask for classification. | Critical thinking<br><br>Through judging findings |
| | **2.4 conclusion/ summary (10min)** | Requesting learners to state Thales theorem of the midpoint in a triangle<br><br>Give the suggestions by the searcher and learners take notes. | Ask questions.<br><br>Take notes. | Creating and innovation through summarizing |
| **3. assessment (20 min)** | | Ask learners to work in a group of questions.<br><br>Find the length of another side of a triangle gives the length of a segment joining midpoints of two sides and vice versa. | Learners do exercises by drawing triangles and explain all steps. | Problem-solving through thinking from midpoint theorem statements |
| **Observation on lesson delivery** (to be completed by the teacher) | | | | |

# Appendix G-7

**LESSON PLAN**

**School Name:** GS Mukarange Catholic **Teacher's Name:** UWAMARIYA Valentine

| **Term** | **Date** | **Subject** | **Class** | **Unit N$^{O}$** | **Lesson N$^{O}$** | **Duration** | **Class size** |
|---|---|---|---|---|---|---|---|
| 2 | 12/06/2019 | Biology and health sciences | S2B | 6 | 8 of 8 | 40min | 70 |

| | |
|---|---|
| **Type of special education needs to be catered for in this lesson and the number of learners in each category** | - |
| **Unit title** | Enzymes |
| **Key Unit competence** | To be able to explain the roles of enzymes in living organisms and how they are affected by temperature and ph. |
| **Title of the lesson** | Mode of enzymes action |
| **Instructional objectives** | Through manipulating different keys and padlocks learners will be able to use the key and lock mechanism to explain how enzymes catalyse reactions accurately. |
| **Plan for this class( location in or outside)** | Inside classroom |
| **Learning Materials( for all learners)** | 10 padlock and 15 keys and different textbooks for senior two and paper handout |
| **References** | Achievers, comprehensive and longhorn biology and health sciences for senior two and book two teacher guide |

| **Timing for each step** | **Description of teaching and learning activity**<br>Using different padlocks and keys learners will realize the action of an enzyme to a particular reaction. | | **Generic competence** and **crosscutting issues** to be addressed<br>+<br>**a short explanation** |
|---|---|---|---|
| | **Teacher activities** | **Learner activities** | |
| **1. Introduction (5min)** | Starting the lesson by making a brief summary of the previous lesson by asking them probing questions:<br><br>1. Distinguish between enzyme and another catalyst.<br><br>2. Explain the following terms in the enzymes function context.<br><br>a) Denaturation | Refreshing their minds about the previous lesson and engaged in the lesson of the day equipped with information about the lesson.<br><br>1. Enzymes are protein in nature and unlike other catalyst enzymes are specific.<br><br>2.<br>a) To alter the original chemical structure of an enzyme. This means that the shape of the active site is changed and the enzyme is completely destroyed | Comprehensive skills are addressed as they trying to remember what they have been studied previously<br><br>Critical thinking is addressed as they are trying to answer the posed questions |

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| | b) Inactivation | b) Enzymes whose configuration is not as intended; for example, the active site is not exposed due to factors such as low temperature | |
| **2. Development of the lesson (30min)**<br><br>**2.1 discovery activities (5min)** | Distribute to the learners the printout of the learning activity and guiding learners to carry out the activity 6.5 on learner's book 2 pages 92 in groups of 10 members.<br><br>Guide and monitor the learner's discussion process, organizational, participatory of each learner in the group. Each group is given different padlocks and keys. | Learners in groups receiving the printout and work upon the activity 6.5.<br><br>Expected answers<br>Refer to the learning activity 6.5 in the teacher's guide. | Analytical skills are addressed as they are analyzing the activity and providing the answers to the activity.<br>Communication skills are enhanced through presenting to the rest of the class. |
| **2.2 presentation learners' findings production (10min)** | After the discussion, the teacher allows learners to present their findings to the rest of the class.<br><br>Teacher monitors presentations and check groups which have difficulties. | Learners present their finding group by group. | Communication and critical thinking developed through discussion and observation respectively. |
| **2.3 exploitation findings production (10min)** | The teacher allows learners to ask questions and give the opportunity to answer each other.<br><br>Teacher views all presented findings while asking learners to provide and confirm the correct and wrong answers<br><br>The teacher asks who has difficulty (slow learners) and request students who understood to explain their classmates. | Learners ask for clarification.<br>Learners answer their classmate's questions.<br><br>Learners help the teacher to confirm the correct answer and identify the key of the lesson.<br><br>Learners help their classmates. | Communication and interpersonal skills developed through interaction.<br><br>Critical thinking developed through harmonizing the learner's findings. |
| **2.4 conclusion/ summary (5min)** | Sums up the lesson by providing a summary of the content that harmonizes the work the students discussed.<br><br>Complements the learner's findings and makes an appropriate conclusive summary of the lesson. | Listening and noting down the main points.<br>Giving comments | Listening and writing skills are addressed through listening to the brief summary and writing them down. |

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| **3. assessment (5min)** | Writing an exercise on the blackboard to be done individually.<br>The sample questions include the following:<br><br>1. Discuss key and lock hypothesis with the aid of diagrams<br><br>2. Think about another example that can act as an enzyme | Learners perform the exercise in exercises notebook.<br><br>……<br><br>…… | Creativity through using what learned to apply it. |
| **Observation on lesson delivery** (to be completed by the teacher) | | | |

# Appendix G-8

## LESSON PLAN

**School Name**: APAGIE Musha **Teacher's name**: Mayuru Jean Claude

| Term | Date | Subject | Class | Unit N° | Lesson N° | Duration | Class size |
|---|---|---|---|---|---|---|---|
| 2 | 17/06/2019 | Biology | S2A | 6 | 3 of 6 | 80min | 50 |

| | |
|---|---|
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | Take care of slow learners |
| **Unit title** | Enzymes |
| **Key Unit Competence** | To be able to explain the roles of enzymes in living organisms and how they are affected by temperature and pH. |
| **Title of the lesson** | Characteristics of enzymes |
| **Instructional Objective** | By using textbooks, learners should accurately describe the characteristics of enzymes based on enzymes made of substances and substrates |
| **Plan for this Class (location: in / outside)** | Computer laboratory |
| **Learning Materials (for all learners)** | Student's books, manila paper, and marks |
| **References** | Student's book |

| **Timing for each step** | **Description of teaching/learning activities** | | **Generic competences** and **Cross-cutting issues** to be addressed + **a short explanation** |
|---|---|---|---|
| | With student's books, learners will make research on enzymes characteristics and present their findings on the blackboard | | |
| | **Teacher's activities** | **Learner's activities** | |
| **1. Introduction (10min)** | Asking some questions<br>- What is an enzyme?<br>- What is a catalyst?<br>- What are the types of enzymes? | Answer teacher's questions<br>……..<br>……..<br>……. | - Critical thinking through remembering the previous lessons<br>- Communication through talk |
| **2. Development of the lesson (50 min)** **2.1 discovery activities (20min)** | - Ask students to form groups of 6 pupils<br>- Provide materials (student's book)<br>- Ask learners to open the book on page 86 and 87 and ask learners to search for characteristics of enzymes<br>- Monitor the students and help them<br>- Ask learners to record their findings (note down) and steps undergone | Form groups of 6 pupils and share responsibility<br>- Learners listen to instructions-Students make research on characteristics of enzymes through student's books<br>- Learners record their findings (note down) and steps have undergone | - Inclusive Education through the involvement of girls and boys<br>- Communication developed through discussion<br>- Cooperation developed through interaction<br>- Research and problem solving developed through search engine activity |

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| | **2.2 presentation learners' findings production (10 min)** | - Invite representatives of the group to present their findings (one among the group members will be randomly chosen to present)<br><br>- Request the rest of the class to write down whatever other groups are presenting<br><br>- Give time to learners to ask for clarifications | - Representatives of groups present their findings<br><br>* Enzymes are protein in nature<br>* Enzyme s are affected by temperature<br>* Enzymes work best at specific pH<br>* Enzymes remain unchanged after catalyzing a reaction<br>* Enzymes catalyze reversibly<br>Reactions<br>* Enzymes are substrate-specific<br>* Enzymes work rapidly<br>* Enzymes are efficient<br><br>Other students follow the presentations<br>- Learners write down questions and comments for clarification<br><br>- Learners ask and comments on each group presentation | - Communication developed through presentation<br>- Interpersonal relations and life skills<br>- Lifelong learning promotes the development of higher-order thinking skills (the way group members assist representative) |
| | **2.3 exploitation findings production (10 min)** | - Ask students to evaluate presentation which one among the characteristics given are correct<br><br>The teacher helps learners to judge the student findings. Put apart correct and wrong answers in order to clarify the intention of the lesson<br><br>- Check if all characteristics have been covered (*) | - Give comments on the production<br><br>- Follow to the correction of teacher<br><br>- Learners ask for clarifications and are comfortable with all the presented findings | - Critical thinking developed through judging information |
| | **2.4 conclusion/ summary (10min)** | - Requesting learners to summarize the characteristics of enzymes by clarifying the characteristics given by themselves<br><br>- Give time to take notes (summary) | - Participating actively in summarizing the contents<br><br>- Make short notes | - Creativity and innovation developed by putting information together |

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| **3. assessment (20 min)** | Engage students to work individually on questions that follow:<br><br>……<br><br>- State any 6 characteristics of enzymes<br>- Explain the specificity of enzymes<br>- What do you think is the role of enzymes? | Do exercise as indicated Learners should clarify:<br>- What are enzymes made of?<br>- What factors affect enzyme action?<br>- Do enzymes act on all substrates?<br>- Do enzymes change after a reaction? | - Critical thinking developed through linking learners' findings and the next lesson |
| **Observation on lesson delivery** (to be completed by the teacher) | | | |

# Appendix G-9

**LESSON PLAN**

**School Name**: APAGIE Musha **Teacher's name**: Mulondani Wasso

| **Term** | **Date** | **Subject** | **Class** | **Unit N$^{O}$** | **Lesson N$^{O}$** | **Duration** | **Class size** |
|---|---|---|---|---|---|---|---|
| 2 | 22/06/2019 | MATHS | S5MCB | 6 | 1of 3 | 80min | |
| **Type of special education needs to be catered for in this lesson and the number of learners in each category** | | | | | | | |
| **Unit title** | Vector space of real numbers | | | | | | |
| **Key Unit competence** | Study linear dependence of vector of $\mathbb{R}^3$ solve problems of angles using scalar and vector or product | | | | | | |
| **Title of the lesson** | Basis of vector space $\mathbb{R}^3$ | | | | | | |
| **Instructional objectives** | Using a ball pen and sheet of paper learners should be able to show accurately whether a given set is the basis of $\mathbb{R}^3$ or not | | | | | | |
| **Plan for this class (location in or outside)** | Inside of the classroom | | | | | | |
| **Learning Materials (for all learners)** | Ball pen, a sheet of paper, chalks and blackboard | | | | | | |
| **References** | Mathematics for Rwanda schools S5 | | | | | | |
| **Timing for each step** | **Description of teaching and learning activity** | | | | | **Generic competence and crosscutting issues** to be addressed + **a short explanation** | |
| | **Teacher activities** | | **Learner activities** | | | | |
| **1. Introduction (5min)** | To ask questions of the definition of linear combination dependence and independence and spanning set | | To define a linear combination of vectors dependent and independent vector spanning a set of vector | | | - Communication through talk and Critical thinking through remembering | |
| **2. Development of the lesson (30min)**<br><br>**2.1 Discovery activities (…min)** | - To provide the manila paper with two sets of vectors to be discussed by linear in groups about dependence independence and spanning set<br><br>- To ask a question about the basis<br>- To guide learners in their group work | | - Learners work in groups using textbooks<br>Learners discuss linearly sets of vector and spanning between the two given sets | | | - Communication developed through discussion<br>- Cooperation developed through interaction<br>- Research and problem solving through engine activity | |

| | | | |
|---|---|---|---|
| **2.2 Presentation learners' findings production (…min)** | - To ask learners chosen randomly through group works to present and share findings of their groups with the classmate | Learners chosen randomly present and share the findings of the group with the other groups | - Communication developed through presentation<br>- Interpersonal relations and life skills<br>- Lifelong learning promotes the development of higher-order thinking skills (the way group members assist representative) |
| **2.3 Exploitation findings production (…min)** | Ask learners to comment about findings of others and guide them in finding properties of the two given sets | Give answers to comments of classmates<br>Give the properties of the two sets of vectors | - Critical thinking developed through judging information |
| **2.4 Conclusion/ summary (5min)** | To require learners in the definition of a basis of $\mathbb{R}^3$<br>To ask them to give as well as possible that definition | Learners give as precisely as possible the definition of a basis of a vector space | - Creativity and innovation developed by putting information together |
| **3. Assessment (5min)** | Engage learners to discuss in groups about given sets whether they are bases or not of $\mathbb{R}^3$ | Do exercise on the blackboard after discussing in groups<br>Explain to classmates the main steps of reasoning | - Critical thinking developed through linking learners' findings and the next lesson |
| **Observation on lesson delivery** (to be completed by the teacher) | | | |

# Appendix G-10

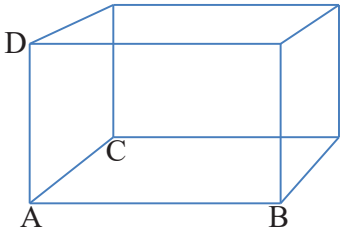
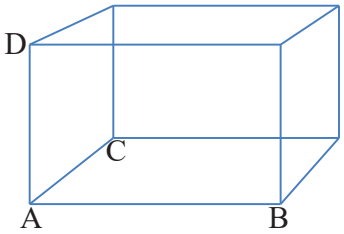
**COMPETENT-BASED LESSON PLAN**

**School Name**: …GSNDA RWAZA **Teacher's name**: KWIZERA Félicien

| **Term** | **Date** | **Subject** | **Class** | **Unit Nº** | **Lesson Nº** | **Duration** | **Class size** |
|---|---|---|---|---|---|---|---|
| II | 4/06/2019 | MATH | S5MPG | 6 | 12 | 80 Minutes | 21 |

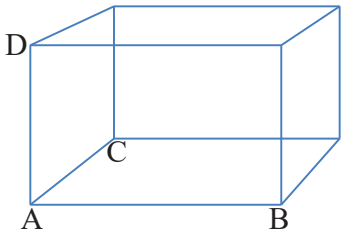
| | |
|---|---|
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | None |
| **Unit title** | Vector space of real numbers. |
| **Key Unit Competence** | ➢ Study linear dependence of vector of $IR^3$, solve problems related to angles using the scalar product in and use the vector product to solve mensuration problems in. |
| **Title of the lesson** | The Application of box product in the calculation of the volume of parallelepiped, triangular prism and tetrahedral triangle. |
| **Instructional Objective** | At the end of this lesson, each learner will be able to calculate:<br>➢ The box product and the volume of parallelepiped, triangular prism and tetrahedral triangle. |
| **Plan for this Class (location: in / outside)** | In class |
| **Skills** | Explain the properties of the vector product. |
| **Attitude and Values** | ➢ Respect for each other during the presentation.<br>➢ Listen to each other explanations critically. |
| **-Learning Materials (for all learners)** | ➢ Blackboard<br>➢ Chalks<br>➢ Books<br>➢ Another syllabus |
| **References** | ➢ Advanced level Mathematics Book ( Learners' book S5) page 207<br>➢ Understanding pure Mathematics, page 409<br>➢ Internet |

| **Timing for each step** | **Description of teaching and learning activity** | | **Generic competences** and **Cross-cutting issues** to be addressed + **a short explanation** |
|---|---|---|---|
| | ➢ The activities will be prepared and it will be written on the blackboard.<br>➢ I write the activities on board.<br>➢ The activity will be concerned with the concretization of theories.<br>➢ The activities will be based on Bloom's taxonomy levels.<br>➢ The activity will be done during teaching and learning and at the end of the lesson.<br>➢ The activities will be done in class. | | |
| | **Teacher activities** | **Learner activities** | |
| **Introduction**<br><br>**20''** | **Excite/ Engage phase**<br>➢ What is to find of shape do we have?<br>➢ Teacher draw that graph on chalkboard: | ➢ The learners observe and answer the question.<br>➢ The learners discuss between them about the dispose of the graph. | ➢ Critical thinking<br>➢ Communication<br>➢ Cooperation and interpersonal skills<br>➢ To see the numbers or pictures and think |

| | | | |
|---|---|---|---|
| |  <br>➢ What is the relationship between $\vec{w}\ and\ \vec{u}$, $\vec{w} and\ \vec{v}$. | | critically about the situation |
| **Development of the lesson**<br><br>**50''** | **(10 minutes) EXPLORE phase**<br>➢ The teacher writes the vectors<br>  <br>$\overrightarrow{AB} = \vec{u}, \overrightarrow{AC} = \vec{v}\ and\ \overrightarrow{AD} = \vec{w}$<br><br>$\vec{v} = (2,1,-3)\ and\ \vec{v} = (-3,1,2)$ and $\vec{w} = (1,-2,3)$<br>➢ Find $\vec{u}.(\vec{v} \times \vec{w})\ and\ \vec{v}.(\vec{u} \times \vec{w})$and $\vec{w}.(\vec{u} \times \vec{v})$<br>And $det(\vec{u},\vec{v},\vec{w})$ | ➢ Each learner works the activities.<br>➢ Present the findings on the blackboard | ➢ Critical thinking<br>➢ Creativity<br>➢ Communication<br>➢ Cooperation and life skills<br>➢ Lifelong learning |
| | **(20 minutes) EXPLAIN phase**<br>The teacher tells the learners that:<br><br>$\vec{u}.(\vec{v} \times \vec{w})$ Presents the volume of a parallelepiped. | ➢ Each student takes/writes the explanations. | ➢ Critical thinking<br>➢ Creativity<br>➢ Communication<br>➢ Cooperation and life skills<br>➢ Lifelong learning |
| | **( 20minutes) ELABORATE phase**<br>Teacher gives the learners a new challenge:<br><br>Determine $det(\vec{u},\vec{v},\vec{w})$<br>If $\vec{u} = (2,-3,1) and\ \vec{v} = (3,2,-3)\ and\ \vec{w} = (-2,3,4)$ | ➢ Each student tries to subdivide a parallelogram into two equilateral triangles.<br>➢ Each student tries to calculate the rea of triangles by using area of a parallelogram. | ➢ Use the model reasons given by the teacher to explain/get the answers<br>➢ Think critically.<br>➢ Communication<br>➢ Lifelong learning<br>➢ Interpersonal skills |
| **Conclusion**<br><br>**10''** | **EVALUATE phase**<br>➢ Guide the learners during making decision/conclusion<br>➢ Write the conclusions given by the learners. | ➢ Present their observations<br><br>➢ Write the global conclusion in their notebook. | ➢ Think critically<br>➢ Communication<br>➢ Lifelong learning<br>➢ Interpersonal skills |

| | | | |
|---|---|---|---|
| | ➢ Add the other interesting points.<br>➢ Write an evaluation of a chalkboard. | ➢ Each student does an evaluation below: | |
| **Teacher self-evaluation** | | | |

**THE ACTIVITIES**




$$\overrightarrow{AB} = \vec{u}, \overrightarrow{AC} = \vec{v} \text{ and } \overrightarrow{AD} = \vec{w}$$

$\vec{v} = (2, 1, -3)$ *and* $\vec{v} = (-3, 1, 2)$ and $\vec{w} = (1, -2, 3)$

Find

- $\vec{u}.(\vec{v} \times \vec{w})$ **( Group A&D)**
- $\vec{v}.(\vec{u} \times \vec{w})$ **(Group B& E)**
- $\vec{w}.(\vec{u} \times \vec{v})$ **( Group C& D)**
- $det(\vec{u}, \vec{v}, \vec{w})$ **( All Groups)**

The team leaders present the findings of their groups and the learners compare the solutions and make a conclusion.

Teacher add comments to the learners' findings and tell them other important applications.

# Appendix G-11

**LESSON PLAN**

**School Name:** APAGIE Musha **Teacher's Name:** Hakorimana Godfroid

| **Term** | **Date** | **Subject** | **Class** | **Unit N$^{O}$** | **Lesson N$^{O}$** | **Duration** | **Class size** |
|---|---|---|---|---|---|---|---|
| II | 22/06/2019 | Chemistry | $S_4$MCB | 6 | 5 of 7 | 80 min | 48 |
| **Type of special education needs to be catered for in this lesson and the number of learners in each category** | | | | Take care of slow learners | | | |
| **Unit title** | Trends in chemical properties of group I and their compounds | | | | | | |
| **Key Unit competence** | The learners should be able to compare and contrast the chemical properties of group 1 elements and their compounds in relation to their position in the periodic table. | | | | | | |
| **Title of the lesson** | The solubility of Group I compounds | | | | | | |
| **Instructional objectives** | Using laboratory equipment, learners will be able to explain and understand the trends in the solubility of group I compounds | | | | | | |
| **Plan for this class( location in or outside)** | In Laboratory | | | | | | |
| **Learning Materials( for all learners)** | LiCl, KCl, conductometer, the beakers. | | | | | | |
| **References** | Internet, $S_4$books from REB | | | | | | |
| **Timing for each step** | **Description of teaching and learning activity**<br>In the laboratory, learners will perform experiments on the solubility of group I compounds | | | | | **Generic competence and crosscutting issues to be addressed + a short explanation** | |
| | Teacher activities | | Learner activities | | | | |
| **Introduction: 5min** | - Ask the students how the trends in the solubility of group I compounds. | | Learners will answer:<br>- The solubility of group I compounds increases from up to down due to increase in ionic character. | | | - Critical thinking through thinking on previous lessons<br>- Communication | |
| **Development of the lesson (30min) .Discovery activities (…min)** | I will ask students to join groups and provide all required materials for conduction of Group experiment.<br>- Verify if they have all available materials as mentioned in the protocol.<br><br>I will distribute protocol and clarify the instructions including laboratory rules. | | - Students have to join their respective groups.<br><br>- Listen to teacher's instructions.<br>- Exchange ideas about protocol. | | | - Critical thinking through the solubility following steps<br>- Problem-solving as they will analyse their finding<br>- Creativity as they will do report<br>- Cooperation as they will work in a group for one activity | |

| | | | |
|---|---|---|---|
| | I will guide the increase in doing the experiments, requesting them to record their findings and must submit their reports to the teacher. | - Put conductometer in KCl and LiCl solution respectively and register their respective conductivities values.<br>- They will use the conductivities values to do a report of the experiment. | |
| **Presentation learners' findings production (15min)** | I will invite randomly one from three groups to present what they have observed and recorded.<br><br>I will tell the other groups to write down what the presenter is presenting. | Expected content from the presentation:<br><br>The solution of KCl has more conductivity than that of LiCl because:<br><br>- K+ion moves very fast than Li+ Ion because it is not hydrated by more molecules of water which in turn may reduce its mobility in aqueous solution.<br>- Lithium-ion is very small in size and more hydrated<br>- K+ has greater ionic mobility.<br><br>The solution of KCl has greater conductivity than that of LiCl because:<br><br>- Lithium chloride is covalent while KCl ionic.<br>- KCl more soluble than LiCl.<br>- The solution of KCl has more conductivity than that KCl because LiCl has covalent character. | - Communication through interactive talk<br>- Cooperation through presentation |
| **Exploitation findings production (10min)** | I will give the opportunity to learners to judge where wrong or right or give critics on presented works.<br><br>I will help them to exchange the true answers between the groups by identifying the wrong answers. | - The leaners from other groups will judge by putting apart the right and wrong answers:<br><br>- They will ask also the questions for clarifications and will have the opportunity to answer each other. | - Critical thinking through analysing their findings<br>- Communication, cooperation and interpersonal management and life skills as they will be judging each other through thinking and talk in harmony |

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|---|---|---|---|
| **Conclusion/ summary (10min)** | I will present the complementary explanation or clarification of any asked question:<br><br>Potassium ion has greater conductivity than $Li^+$ because descending down the group, ionic radius increases and the charge density decrease like polarizing power decreases. Due to this, the ion moves very fast and the conductivity increases because of less hydration. | Learners listen to teacher's complementary explanation and use them with their findings to summarize the lesson:<br><br>"$Li^+$ is highly solvated than $K^+$ due to its smallest size and mobility decreases, thus conductivity decreases.<br>They then take summary notes. | - Creativity and innovation by putting information together |
| **Assessment (10min)** | I will ask questions :<br>1. Explain the trends in conductivity of Group I chloride solutions.<br><br>2. Is KCl more soluble than LiCl in pure water? Explain this according to the position the metals (K and Li) on the periodic table. | Their answer would comprise:<br>1. The conductivity increases from up to down due to increase of ionic mobility.<br><br>2. KCl is more soluble than LiCl because $Li^+$ion has greater polarizing power that provides LiCl more covalent character than KCl. | Critical thinking developed through linking learners' findings and the next lesson |
| **Observation of lesson** | | | |

# Appendix G-12

## LESSON PLAN

**School name**: **GS Notre Dame de Apotres RWAZA** **Teacher's name: NSANZIMANA Emmanuel**

| Term | Date | Subject | Class | Unit Nº | Lesson Nº | Duration | Class size |
|---|---|---|---|---|---|---|---|
| II | 30/06/2019 | CHEMISTRY | S4PCM | 6 | 8 of 9 | 80min | 22 |
| **Type of Special Educational Needs to be catered for in this lesson and number of learners in each category** | | | | Learners with low skills in handling laboratory materials. | | | |
| **Unit title** | | Trends in chemical properties of group I and their compounds | | | | | |
| **Key Unit Competence** | | The learners should be able to compare and contrast the chemical properties of group I elements and their compounds in relation to their relation in the periodic table. | | | | | |
| **Title of the lesson** | | Effect of acid on the group I carbonates | | | | | |
| **Instructional Objective** | | Given laboratory apparatuses and chemicals, learners should be able to explain the effect of acids on the group I carbonates. | | | | | |
| **Plan for this Class (location: in / outside)** | | In Laboratory | | | | | |
| **Learning Materials (for all learners)** | | • Chemicals (Sodium carbonate, $Na_2CO_3$, Hydrochloric acid, HCl, Lime water, Potassium hydrogen carbonate, Distilled water)<br>• Apparatuses (Beakers, test tubes, test tube holder, Measuring cylinders) | | | | | |
| **References** | | Fountain S4 Pg. , Pearson S4 Pg. . | | | | | |

| **Timing for each step** | | **Description of teaching/learning activities** | | **Generic competences** and **Cross-cutting issues** to be addressed + **a short explanation** |
|---|---|---|---|---|
| | | In the laboratory, learners will be given activities to perform experiments on the effect of heat on the group I carbonates.<br>Learners will do activities in groups. The evaluation will be done individually. | | |
| | | **Teacher's activities** | **Learner's activities** | **Teacher's activities** |
| **Introduction**<br>**10min** | | Asks the learners to write the examples of group I carbonates and hydrogen carbonates.<br><br>Asks learners to write the reaction between $Na_2CO_3$ and HCl | Expected answers:<br>• $NaCO_3$, $Na_2CO_3$, $K_2CO_3$, $NaCO_3^{2-}$, $KCO_3$, $NaHCO_3$, $KHCO_3$, $K2HCO_3$, $LiHCO_3$.<br><br>Expected answers:<br>• $Na_2CO_3+HCl \rightarrow NaCl+H_2O+CO_2$<br>• $Na_2CO_3+HCl \rightarrow NaHCO_3+NaCl$<br>• $NaHCO_3+HCl \rightarrow NaCl+H_2O+CO_2$ | • Communication between teacher and students.<br>• Peace and values education. |
| **Development 50min** | **Discovery activities** | Distributes all required materials and chemicals for the experiment.<br>Distributes worksheet for activities.<br>Guides learners when doing experiments. | Learners conduct experiments. | • Communication between learners.<br><br>• Critical thinking through discussion between learners.<br><br>• Cooperation with others as a team in whatever task assigned. |
| | **Presentation of learners findings production:** | Invites the learners randomly to present what they have observed and recorded.<br><br>I will tell the other groups to compare their findings with theirs | Explain their findings.<br>Compare the findings in different groups.<br>Expected findings:<br>• Group one carbonates react with acids to form a salt, water and carbon dioxide released.<br>$Na_2CO_3+2HCl \rightarrow 2NaCl+H_2O+CO_2$<br><br>• Group one hydrogen carbonates react with acids to form a salt, water and carbon dioxide released.<br>$NaHCO_3+HCl \rightarrow NaCl+H_2O+CO_2$<br>Carbon dioxide gas turns milky lime water.<br>$Ca(OH)_{2(aq)}+CO_{2(g)} \rightarrow CaCO_{3(s)}+H_2O(l)$<br>$CaCO_{3(s)}$ is a white precipitate | |

| | | | | |
|---|---|---|---|---|
| | **The exploitation of findings production** | Gives opportunity to learners to judge where wrong or right answers.<br>Helps the learners to explain their findings. | Learners in different groups share the best answers. | |
| **Conclusion**<br><br>**20min** | | **Summary:** Teacher summarizes the content.<br>Group one carbonates react with acids to form a salt, water and carbon dioxide released.<br><br>$NaHCO_3+HCl \rightarrow NaCl+H_2O+CO_2$<br>$Na_2CO_3+2HCl \rightarrow 2NaCl+H_2O+CO_2$<br>Generally:<br>$M_2CO_3+HxVy \rightarrow MxV+H_2Oy+CO_2$<br>Carbon dioxide released is tested by using lime water, $Ca(OH)_2$.<br><br>It turns milky lime water(white precipitate is formed)<br>Reaction:<br>$Ca(OH)_{2(aq)}+CO_{2(g)} \rightarrow CaCO_{3(s)}+H_2O(l)$<br><br>**Evaluation:**<br>**(a)**Complete the following reactions:<br>**i.** $K_2CO_3+HCl \rightarrow$<br>**ii.** $NaHCO_3+HCl \rightarrow$<br><br>**(b)**Write the ionic equation for the reaction in (i).<br><br>**(c)**Identify and name the gas produced in (i).<br><br>**(d)**Give the reagent used to test the presence of gas and write the chemical equation for the test. | Write the summary in their notebooks.<br><br>Leaners do the evaluation individually. | • Communication between teacher and students.<br><br>• Peace and values education. |
| **Self-evaluation** | | | | |

# Appendix 17. Minutes of the 1st JCC

**THE PROJECT FORSUPPORING INSTITUTIONALIZING AND IMPROVING QUALITY OF SBI ACTIVITY (SIIQS)**

**MINUTES OF THE FIRST JOINT COORDINATION COMMITTEE (JCC)**

1. **DATE AND TIME**: 23rdMarch, 2017, 15:30-17:30
2. **VENUE**: TEMPD Meeting Room
3. **ATTENDANCE:** The attendance list is attached as **(ANNEX 1)**
4. **AGENDA**

- Welcome Address (REB/JICA)
- Presentation on Project Work Plan
- Presentation on Project Management Mechanism (Monitoring Sheet Ver.1)
- Presentation on preliminary findings of the Baseline survey
- Issues
- Question and Answer
- Closing Remarks

**5.OPENING**

The meeting was held at TEMPD Meeting Room, on 23rd March, 2017. It started at 15.30 with HoD TEMPD welcoming participants.

**6.INTRODUCTION OF CHAIRPERSON**

The HoD TEMPD, Mr. Claudien NZITABAKUZE, who was delegated by the Director General, REB, Mr. Gasana I. Janvier, chaired the JCC meeting in hisabsence.

**7. OPENING REMARKS**

A welcome speech was made on behalf of the DG/ REB who could not attend the meeting as chair. The delegated Chair, Mr. Claudien Nzitabakuze started by welcoming the participants in the 1st JCC meeting of the Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS). He presented to the meeting participants the background of the SIIQS Project, and the partnership of REB and JICA that has been existing for about ten years and on behalf of the Government of Rwanda, he expressed his sincere gratitude to the Government of Japan for the support and partnership it has always provided to Rwanda, particularly to the education sector through REB. Mr. Claudien introduced the partnership between REB and JICA and mentioned about the last projects, which have been implemented by REB in partnership with JICA, namely SMASSEand SBCT, and later on he put an emphasis on SBI concept which has been introduced in the later project. He mentioned that, the SBI concept is going to be a channel to the dissemination of the new curriculum (CBC) introduced by REB in 2016, and that the new project SIIQS will be supporting, institutionalizing and improving SBI quality in our schools for

the better dissemination and implementation of CBC. He concluded by wishing all participants fruitful deliberations and invited the JICA Chief Representative to also give his welcoming remarks to the participants.

The JICA Chief Representative, Mr. Hiroyuki Takada started by welcoming participants to the very first meeting of the SIIQS Project, and congratulated all the members for the officiallaunching of the SIIQS Project, which he thinks will be contributing a lot to the implementation of the CBC.He mentioned about JICA support in different core sectors, such as infrastructure, health, waterand mostly in education. He mentioned that JICA is supporting education sector in Rwanda not only through the government institutions but also through private companies such as Sakura-sha, which is a Japanese Educational Publishing Company producing a mathematics software. He kept on emphasizing that education is essential to achieve the nationalmillennium goals and vision 2020 and that JICA is glad to support in achieving them. He also introduced the new project SIIQS and the NGO that will be collaborating closely with the project, Umucomwiza school in Kimironko sector. That school introduced SBI through CBC so it is hoped to combine contributions and targetsof the project and that local NGO through its school Umucomwiza will be one of the project pilot schools. The JICA Chief Representative concluded by thanking all the participants for responding to the invitation and wished them a fruitful meeting.

The Chair of the meeting invited participants to introduce themselves and then read to them the agenda of the meeting.

## 8. PRESENTATION ON THE PROJECT WORK PLAN (ANNEX 2)

Mr. Ryuichi Sugiyama, the Team Leader of SIIQSProject presented the Project Work Planwith the project background and the outline of the project. He also mentioned about SIIQS Project brief, with an emphasis on the combination of cascade training and the SBI problem solving cycle and how the DCC is needed for the smooth running of SBI activities. He explained about the two major activities, output 1: Contents development for SBI and Output 2: Quality assurance (M&E). He also mentioned about the project team members of and their assignments. He ended his presentation with suggestion and request: formation of lesson study group for model lesson development and selection of pilot schools.

The Chair of the meeting supplemented that the project focuses on both technical and managerial parts of teachers' continuous professional development and made some comments emphasizing the role of the project and collaboration with other stakeholders: TTC, UR-CE, and all the development partners.

## 9. PRESENTATION ON PROJECT MANAGEMENT MECHANISM(ANNEX 3)

Ms. Harriet Umurerwa, Teacher training officer: Career Guidance and Counselling presented the project management mechanism using monitoring sheet of the project based on Project Design Matrix (PDM)with reference to the Record of Discussion agreed upon between MINEDUC/REB and JICA.The Project Team and counterparts will continuously monitor the project progress by revising the monitoring sheet and present it at JCC every six months. It will be finally approved

by DG REB and then submitted to JICA.She added that no issues and items to be revised were observed on PDM because the circumstances around the project have not significantly changed until now since after the agreement was signed.

The Chair of the meeting also suggested not to wait for six months before meeting and sharing the progress of the project in the next JCC but to inform the JCC members at the end of every month by email about the progress of the project, the activities conducted, the upcoming activities, the challenges encountered and the project plans.

## 10. PRESENTATION ON THE PRELIMINARY FINDINGS OF THE BASELINE SURVEY (ANNEX 4)

### (1) OUTLINE OF THE BASELINE SURVEY & PRELIMINARY ANALYSIS ON CURRICULUM DELIVERY

Ms. Ruth Mukakimenyi/Teacher training officer: English language presented on the preliminary findings of the baseline survey. She started her presentation with the outline of the baseline surveysuch as the objectives, organization, sample size and structure etc; and moved on to its preliminary analysis on curriculum delivery. She pointed out that syllabus and textbooks were not fully delivered to schools and CBC induction trainings were not fully conducted, and that these hinder the fulfilment of first layer of the curriculum: intended curriculum.

### (2) THE PRELIMINARY FINDINGS FROM THE LESSON OBSERVATIONS (on the Implemented Curriculum)

After Ms. Mukakimenyi's presentation, Prof.Yumiko Ono, from Naruto University of Education, also presented on the preliminary findings from the lesson observations (on the implemented curriculum). She started by appreciating how the teachers she observed arepreparing unit and lesson plans,how theyencouraged and motivated learners to work collaboratively in groups, how they recognized students' efforts by clapping, gestures and singingand how some of the teachers try hard to prepare their own teaching aids. However, she noticed lots of issues which still need to be addressed. Among these issues are: 1) the textbooks scarcity is still a big issue for most of the schools, 2) basic knowledge and skills have not been well acquired by students for critical and creative thinking, 3) being asked if they understood, students automatically answer "yes" in chorus even though they don't understand, 4) teachersare jumping into group works without instructions on a given task, 5) there is little individual mastery of basic knowledge and skills for students to beengaged in critical and creative thinking. Prof. Ono recommended the following: Teachers should not be slaves of group work and not to expect to achieve competency in one lesson as its development takes some time. Instead of asking"do you understand?" or "are we together?", they should single out students who still have difficulties in understanding the lessons through careful observation and assessment. She concluded by pointing out the importance ofsetting clear objectives of the lessons and steps to be taken.

### (3) APPROACH TO ATTAINED CURRICULUM IMPACT (ATTAINMENT) SURVEY

After Prof. Ono's presentation and recommendations, Mr. Sugiyama presented on the impact survey and its upcoming activity. He mentioned about JICA's recommendation on organizing Trends in International Mathematics and Science Study (TIMMS) type test to monitor how higher order thinking level changes through CBC implementation. The project would like to conduct such test in some schools in June, and the proposed target number of schools was presented in the meeting.He also informed the participants about the Distance Education and Teacher Education in Africa (DETA) conference which will be held at UR-CE in August 2017, and presented his high interest to the conference and especially to the UR-CE to let the SIIQS present and share the baseline survey findings.

The Chair of the meeting added a comment after the series of presentations. The Chair argued that people should not worry too much about the result of baseline survey because it has not been a long time since CBC started and that current syllabus is well-organized and desired learning approach has been changed from old curriculum. However he pointed out that the problem is how syllabus should be interpreted to actual lessons. According to him, some schools expressed confusion about CBC and struggled with group work because they did not know other approaches to implement it.

Mr. Sugiyama supplemented the presentation by referring to the three layer of curriculum as follow: The first layer, intended curriculum is the one prepared by a national authority (REB) andshould be the same in all schools in the country. Implemented curriculum, the second layer, is how teachers put intended curriculum into practice at each school. Attained curriculum, the third layer, is the one acquired by students in the presence of intended and implemented curriculum.

## 11. DISCUSSION

After all presentations, participants started discussing and asking questions.

Dr. Christine Gasingirwa, DG in MINEDUC in charge of Science and Technology started the discussion and asked about the REB-JICA collaboration in the previous projects in terms of changes the projectshave brought, problems they solved, improvement,some weakness from the SBI concept, whether teachers were really convinced andwhether they have already started developing critical thinking orproblem-solving aspects

Mr. Sugiyama responded to her, referring to teachers' good practices after SBI implementation to schools: sharing culture with colleagues, making teaching aids/materials by themselves and becoming active to solve their problems by themselves. Teachers are now positive and confident to be observed during their lessons, which is different from how they were before implementing SBI, all the way from SMASSE to SIIQS.

Mr. Joseph Rutakamize, Director of Science Unit from CPMD Department, also highlighted the role of Education Quality and Standards Department, and asked where their role is in the project, because the Subject Inspectors and Provincial Inspectors' role seem crucial in the project implementation.He indicated that more collaboration between the Inspectors and DEOs/SEOs is necessary.

Dr. Wenceslas Nzabalirwa, UR-CE, asked about the pedagogical contents knowledge aspects, if the project can help to find an appropriate way to use group work. He also asked about the collaboration between UR-CE, TTC and VVOB to conduct same survey in the TTCs to know the current situation. Other than above, he asked about how the peer-learning can be integrated in the curriculum.Regarding these questions, the SIIQS Project will work together with UR-CE and VVOB in the area of model lesson development.He mentioned about DETA international conference as one of the coordinators in UR-CE.He requested the project to send the abstract of SIIQS presentation for the upcoming international conference as the findings of the survey are really interesting and there is a need to share them with others.

Ms.Vincentie Nyangoma from ICT Department asked about how the project will be organizing model CBC lesson. She appreciated that model lesson videos will enrich digital contents materials in ICT Department. The ICT department would like to hear about the impact in the use of technology in the Rwandan classrooms. This will be discussed later between SIIQS Project and ICT Department.

Ms. Mukakimenyi from TEMP Department suggested that it would be better to have a look at different surveys which have been conducted by REB and development partners regarding the new curriculumso far, so that the findings could be harmonized.

## 12. CLOSING REMARKS

Mr. Claudien, ended the meeting by thanking all the participants for their great contributions in the meeting and called for theirsupport and collaboration for the smooth running of the project.After giving his closing remarks, he also invited Mr. Shuhei Saikawa, to also give his remarks on behalf of JICA. Mr. Saikawa emphasized on the importance of Prof. Ono presentation that teachers should see if pupils are really following and that education should be learning-centered rather than just learner- centered. He mentioned that collaboration with other departments in REB and all thedevelopment partnersis very important for the better implementation of the CBC.

The meeting adjourned at 17.30 and the participants shared coffee/ tea and snacks while discussing for the further collaboration.

Done at Kigali, 23rd March 2017,

**Claudien NZITABAKUZE**
**Chairperson of the Meeting,**
**Head of Department, TEMPD**

**Berthine GIKUNDIRO**
**Programme Assistant,**
**SIIQS Project**

# Appendix 18. Minutes of the 2nd JCC

# THE PROJECT FOR SUPPORING INSTITUTIONALIZING AND IMPROVING QUALITY OF SBI ACTIVITY (SIIQS)

## MINUTES OF THE SECOND JOINT COORDINATION COMMITTEE (JCC)

1. **DATE AND TIME**: 31st October, 2017, 15:30-17:30
2. **VENUE**: TEMPD Boardroom
3. **ATTENDANCE:** The attendance list is attached as **(ANNEX 1)**
4. **AGENDA**

| | | |
|---|---|---|
| 15:30 - 15:40 | Welcome Address | REB/JICA |
| 15:40 - 15:50 | Introduction of JCC participants | |
| 15:50 - 16:00 | Introductory video | |
| 16:00 - 16:15 | Progress of Output 1<br>- Lesson study practice and model lesson development<br>- Training material development for the 3rd phase CBC training | Mr. Ryuichi Sugiyama |
| 16:15 - 16:30 | Progress of Output 2<br>- Problem-analysis workshop and action planning for DCC in pilot districts<br>- Feedback on the action plan | Ms. Sayaka Matsuzuki |
| 16:30 - 17:00 | Problems and issues in Project Management<br>- Prospects and risks based on Baseline survey and monitoring<br>- Way forward to CPD institutionalization | Mr. Ryuichi Sugiyama |
| 17:00 - 17:20 | Question and Answer | |
| 17:20 - 17:25 | AOB | |
| 17:25 - 17:30 | Closing Remarks | |

## 5. OPENING

The 2nd Joint Coordination Committee (JCC) meeting was held at the Boardroom of Teacher Education Management and Professionalisation Department (TEMPD), Rwanda Education Board (REB) on 31st October, 2017. It started at 15:30.

## 6. INTRODUCTION OF CHAIRPERSON

Mr. Claudien Nzitabakuze, Head of TEMPD, who was delegated by Mr. Gasana I. Janvier, Director General (DG) of REB, chaired the JCC meeting in his absence.

## 7. OPENING REMARKS

A welcome speech was made on behalf of Mr. Janvier who was not able to attend the meeting as chair. Mr. Nzitabakuze, started by welcoming the participants to the 2nd JCC meeting of the Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS Project). He presented to the meeting participants the background of the SIIQS Project, and the partnership of REB and Japan International Cooperation Agency (JICA) for about ten years now and on behalf of the Government of Rwanda. He expressed his sincere gratitude to the Government of Japan for the support and partnership it has always provided for Rwanda, particularly to the education sector through REB.

He reminded the participants about the background of SIIQS Project which commenced in January 2017, aiming at enhancing teachers' understanding of Competence Based Curriculum (CBC) based lesson implementation and problem-solving capacities at school, sector, district and national level. The 1st JCC was held on 23rd March 2017 and the participants were informed about the project brief, project management mechanism and preliminary findings from the baseline survey. Subsequently, they discussed for better understanding and implementing of the project, and further collaboration.

He mentioned that SIIQS Project helps REB to develop materials for supporting CBC trainings at the national level, outlining challenges and solutions. And he declared that the project achieved several activities in the past six months.

Mr. Tomonori Nagase, Senior Representative of JICA Rwanda Office, who was delegated by Mr. Nobuyuki Takada, Chief Representative, started by thanking REB for its continuous partnership in implementation of SIIQS Project. He mentioned that he was eager and happy to see the progress of the project and gave back the flow to Mr. Nzitabakuze. He invited participants to introduce themselves and then informed to the participants the agenda of the meeting. He then invited SIIQS Project team to start the presentation.

## 8. INTRODUCTORY VIDEO AND PRESENTATION ON PROGRESS OF OUTPUT 1

Mr. Ryuichi Sugiyama, the Team Leader, started by thanking the participants and introducing himself to the JCC participants. He reminded the participants of the project scope and two key approaches. In order to show the progress of output 1 on teachers' understanding of CBC-based lesson implementation, he proposed them to watch a ten-minute video which was made for the National Career Guidance Summit held on 26th October 2017 at the Kigali Convention Center. The video mainly consisted of the followings three parts.

- Achievement of the previous project, the Project of Strengthening School-Based Collaborative Teacher Training (SBCT Project), which introduced the concept of School Based In-service Teacher Training (SBI) to schools throughout Rwanda and ended in December 2015.
- Activities implemented in SIIQS Project such as introduction of Lesson Study (LS).
- Concept of District CPD Committee (DCC) to ensure quality of CPD which will contribute to learners' achievement.

He then, showed model lesson videos and explained that they were produced as a final product of LS in model schools. He also demonstrated Audio/Visual (A/V) training material which was developed for the 3rd phase CBC training. It embedded model lesson videos as main contents. He put an emphasis on the project's approach, that is, practicality, evidence-based and relevance to the existing issues and challenges to help teachers in schools rather than providing academic theories. He also congratulated the induction of A/V material which opened new training paradigm ensuring training quality with provision of coherent instruction and concreate visual images to all teachers in the country.

## 9. PRESENTATION ON PROGRESS OF OUTPUT 2

Ms. Sayaka Matsuzuki mentioned about the importance of a CPD support mechanism and the problem solving cycle. She also mentioned the DCC establishment status as of October 2017. Four districts seemed not to be interested in DCC, or did not know anything about it, one district recognized the DCC but was waiting for further direction from REB. Six districts are in preparation and 19 others have already established. Taking account of difference among district status, four pilot districts were selected so that the experience in the pilot districts can inform good practices for institutionalization in each district. The focus of pilot activities was on raising awareness among DCC members about learners' achievement in their own district, and hence the analysis of national exams was provided in the DCC workshops in the districts. The DCCs made action plans and started implementation through different activities.

## 10. PRESENTATION ON PROBLEMS AND ISSUES

### (1) Progress of Deliverables

Before discussing problems and issues, Mr. Sugiyama first informed about deliverables as shown in the table below.

| | Deliverable | Status |
|---|---|---|
| SIIQS Project | Concept note for CBC induction training phase III | Completed |
| | Sample lesson videos | Completed |
| | CBC & CPD training material | Drafted |
| | Lesson Study Guide (Video) | Drafted |
| | Concept note for DCC | Discussion is underway among stakeholders |
| | DCC operation manual | Discussion is underway among stakeholders |
| | CPD monitoring form | Discussion is suspended |
| Other Program | SBMP Manual | Reviewed, further discussion will be made to harmonize CPD |
| | Teacher Development Framework | Reviewing the draft material prepared by UNESCO to properly include CPD |
| | CPD manual VVOB | Discussion is underway with VVOB to integrate Lesson Study |

### (2) Risks

Regarding the risks that the SIIQS project identified, the fact that CPD and DCC were incorporated in the draft Education Sector Strategic Plan (ESSP) for 2018/19-2023/24 is a positive risk, in that there is a possibility to expand REB/TEMP's contribution to education.

However, there are also negative risks. Teachers still apply conventional teaching style after two years from introduction of CBC. This was illustrated in the research result based on the baseline survey in March, as a few open questions compared to considerable number of closed questions in lessons. This may have led to unsatisfactory result of the test conducted in the model schools. The percentage of S4 students' correct answers on P4 level or S1 level questions was not significantly higher than that of S1 students. Teaching is not scaffolding learning.

Other risks were delay in textbook procurement, implementation of sector-based training and its quality control, engagement of all teachers in school-based CPD and insufficient use of online monitoring system.

In terms of online monitoring system, there is a need to clarify the situation after the transfer of Education Quality and Standard Department (EQS) to the Ministry of Education (MINEDUC). Mr. Sugiyama also referred to the weakness of current national exam records, which prevented detailed data analysis to inform districts about strengths and weaknesses related to learners' achievement.

### (3) Way Forward

As a way forward for institutionalizing CPD, Mr. Sugiyama suggested followings from policy, financial and technical aspects;

- More sensitization and advocacy for Vice Mayors
- Integration of CPD in Imihigo (performance contract) as an enabler of CPD expansion and quality
- Availability of capitation grant for CPD
- Provision of detailed achievement data for CPD planning

## 11. DISCUSSION

Mr. Nzitabakuze started by thanking for their presentations and welcomed the participants' comments and questions.

He started with a question about the possibility of scale-up of DCC support, rather than starting with four pilot districts.

Mr. Sugiyama replied to him that the SIIQS project had an intention to institutionalize DCC in all districts but it was more important to extract good practices from the pilot districts, considering the fact that not all districts have established DCC after more than one year from the letter from REB requesting establishment. Hence, the project will disseminate the experience in the pilot district to others, taking account of the difference in the status of education sector among districts. Mr. Nzitabakuze confirmed that tools used by the project can be used in other districts too.

In terms of assessment, Mr. Nzitabakuze suggested that next time the project could focus on formative assessment more than national examination.

He mentioned that TEMPD would identify staff members to work with and coordinate discussion on the online monitoring system to find out an appropriate way to operate it.

Dr. Fabien Habimana, Director of Science Unit, MINEDUC, representing the DG of Science, Technology and Research, and Dr. Michael Tusime, Head of EAD, REB, asked the SIIQS Project team about the kind of questions that the project gave to students in the tests.

Mr. Sugiyama answered that they were LARS type tests which included questions from textbooks, Trends in International Mathematics and Science Study (TIMMS) and national exam of other countries.

Dr. Habimana and Dr. Tusime expressed concerns that correct answer rate of P4 level questions were unexpectedly low even among S1 and S4 students, 53.9% and 60.5% respectively. Dr. Mike suggested that this result may be because some parts of the syllabus may have been skipped. They have to carefully compare the test tool and syllabi to fully understand the reason. Dr. Habimana also recommended that the tool should be shared with EAD and Curriculum Pedagogical Materials Production and Distribution Department (CPMD) so that they can find out problems as one institution.

Mr. Nzitabakuze concluded that in the future, the project should share test tool with the departments involved such as EAD and CPMD for quality assurance before using them. The factors which attribute to low achievement of learners should be also investigated by the project team and REB together when analyzing the results.

Dr. Tusime also pointed out that Development Partners (DPs) should coordinate and make sure that the DCC is in place in all districts and the same mandate should not be held by any other organization in the districts. He also suggested that DCC's action plan should include quantitative indicators to measure the level of achievement.

Mr. Sugiyama ensured it by referring to the situation that a meeting with DPs concerned was set on the following day of the JCC, and that a clear guidance will be eventually set for districts. He added that there is not any other organization which deals with teachers' CPD at the district and sector levels and that the district education committees mainly discuss issues such as the school infrastructure and drop-out as far as the project investigated. Therefore, TEMPD should play a supervisory role in operationalizing DCCs. Ms. Matsuzuki answered that all the DCC's action plan set objectively verifiable indicators.

Dr. Tusime inferred that the reason why DCCs are not yet active and do not know what to discuss may be because they cannot prioritize issues.

Mr. Shuhei Saikawa, JICA Education Program Advisor, supported the project team's response by referring to his finding that CPD, especially school-based CPD, has seldom been discussed in the district education committee. He stated that, given that different DPs supported education sector at school, sector or district levels throughout the country, DCCs should be a focal point which conduct mapping and coordinate support to optimize the outcome. Ms. Ruth Mukakimenyi added that DPs appreciated and supported CPD (SBI), and coordination among DPs already exist and work together to avoid duplication and maximize their support.

Ms. Anathalie Nyirandagijimana, Pedagogical norms specialist of CPMD, REB, representing the head of department, informed that one CPMD officer is assigned per district to coordinate with districts and so they would assist DCC activities on the ground level. She also appreciated the idea of analyzing national exams in detail and would like to learn more about it.

The documents related to DCC shall be shared with CPMD and EAD later.

## 12. CLOSING REMARKS

Mr. Nzitabakuze, ended the meeting as a chair by appreciating the activities implemented by the SIIQS project so far and all the participants for their great contributions toward the achievements of the project targets and thus the achievement of teaching and learning. He also thanked JICA for its continuous cooperation and partnership with REB. He invited participants for a health break for more discussions and collaboration. The meeting officially adjourned at 17:30.

Done at Kigali, 31st October 2017,

Claudien NZITABAKUZE
Chairperson of the Meeting
Head of Department, TEMPD

For
Ryuichi SUGIYAMA
Team Leader
SIIQS Project

# Appendix 19. Minutes of the 3rd JCC

# THE PROJECT FOR SUPPORING INSTITUTIONALIZING AND IMPROVING QUALITY OF SBI ACTIVITY (SIIQS)

## MINUTES OF THE THIRD JOINT COORDINATION COMMITTEE (JCC)

**I. DATE AND TIME**: 14th March, 2018 from 15:30-17:30

**II. VENUE**: TDM Department Boardroom

**III. ATTENDANCE:** Annexed

**IV. AGENDA**

| | | |
|---|---|---|
| 15:30 - 15:40 | Welcome Address | REB/JICA |
| 15:40 - 15:50 | Introduction of JCC members | |
| 15:50 - 16:05 | Progress of Output 1 | Mr. Antoine Mutsinzi |
| | • Phase III CBC training for National Trainers | Mr. Ryuichi Sugiyama |
| | • Phase III CBC training for Sector-Based Trainers | |
| 16:05 - 16:20 | Progress of Output 2 | Mr. Antoine Mutsinzi |
| | • National DCC Forum | Mr. Ryuichi Sugiyama |
| | • DCC Orientation | |
| | • Phase III CBC training for DDEs/DEOs/SEOs | |
| 16:20 - 16:40 | The M&E of the project | Mr. Antoine Mutsinzi |
| | • JCC membership | Mr. Ryuichi Sugiyama |
| | • Project team | |
| | • Evaluation | |
| | • Risk | |
| | • Upcoming activities and way forward | |
| 16:40 - 17:00 | Questions and Answers | |
| 17:00 - 17:20 | Farewell Presentation from Program Advisor of JICA Rwanda Office (Education and Vocational Training) | Mr.Shuhei Saikawa |
| 17:20 - 17:25 | AOB | |
| 17:25 - 17:30 | Closing Remarks | |

## 1. INTRODUCTION

The 3rd Joint Coordination Committee (JCC) meeting was held at the boardroom of the Department of Teacher Development &Management and Career Guidance & Counselling (TDM&CGC)), Rwanda Education Board (REB) on 14th March, 2018 and started at 15:30. The meeting was co-chaired by Ms.Angelique Tusiime, Deputy Director General (DDG) of REB, Mr. Tomonori Nagase, Senior Representative of Japan International Cooperation Agency (JICA).

## 2. OBJECTIVES OF THE MEETING

Mr. Claudien Nzitabakuze, the head of TDM and the Manager of the Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS) welcomed the participants and he thanked them for dedicating their time to the 3rd JCC meeting of the Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS). He introduced to participants the purposes of the meeting namely:

(1)To report the progress and achievements of the project

(2)To inform upcoming activities and

(3)To discuss the problems and issues.

## 3. OPENING REMARKS

Opening remarks were given by Ms. Tusiime, on behalf of DG who was not able to attend the meeting as chair. She recognised the participants for attending the 3rd JCC meeting of the SIIQS Project. She told the participants that she was very honoured to be part of the programme. She also said that she was really happy for the culture of joint collaboration between JICA and REB. She expressed her sincere gratitude to the Government of Japan for the support and partnership it has always provided for Rwanda, particularly to the education sector through REB. She, especially, thanked JICA/SIIQS Project team for a huge contribution it has been providing in improving the quality of education in Rwanda by providing technical expertise and building capacity of Rwandan teachers for enhancing their understanding on Competence Based Curriculum (CBC).

She reminded the participants that the Government of Rwanda is currently focusing, not only, on the quantity or number of students in schools, but also on the quality of education these children are getting. She also urged the participants to be aware of what is happening inside the classrooms by getting closer to teachers and guiding them in terms of teaching methodology. It is very essential to have education facilities such as building, electricity, textbooks, computers and other teaching materials; however there must be a close follow up of what is happening inside the classrooms in order to reach the quality of education we are striving for.

Mr. Nagase started by thanking REB for its continuous partnership in the implementation of SIIQS Project. He mentioned that he was eager and happy to see the progress of the project and he had no doubt that SIIQS Project would achieve its objectives because Rwandan people are used to understand, and are open to accept the change. He also emphasized on the quality of education and encouraged participants to consider what is happening in classrooms.

## 4. INTRODUCTION OF JCC MEMBERS

Mr. Ryuichi Sugiyama, the Team Leader of SIIQS Project explained to participants that the JCC is the steering committee of the project that monitors the progress of activities and leads discussions to take necessary actions against the raised issues to keep the project on the right track. Members of the JCC were stipulated under the Record of Discussion of the SIIQS Project, which is a bilateral agreement between REB and JICA. The official members were assigned from both sides. In addition, both sides are allowed to invite person(s) who may contribute to the project, if necessary. Mr. Sugiyama expressed his concerns about the new structure of REB which would affect the JCC membership.

## 5. PROJECT PROGRESS

Mr. Sugiyama presented to participants the project scope, i.e. the overall goal, the project's purpose and the outputs. SIIQS Project has two outputs that:

- Teachers' understanding of CBC-based lesson implementation is enhanced.
- Problem-solving capacities are enhanced at school, sector, district, and national level.

**(1) Progress of Output 1:** Teachers' understanding of CBC-based lesson implementation is enhanced

Mr.Antoine Mutsinzi and Mr. Sugiyama shared with participants what have been achieved for output 1.

Phase III CBC training for National Trainers (NT) was conducted from 2nd to 7th November in Bugesera. 141 National Trainers were trained and 100 of them were qualified. The program was developed by joint operation team of TDM/REB, SIIQS and a UNICEF consultant in a harmonized manner. They also served as trainers. Drafted training material (Audio-Visual aid) was tested and reviewed (then revised afterward). Key focus areas for the training were Active learning methods and Meaningful learning tasks and questioning for quality formative assessment.

Phase III CBC training for Sector-Based Trainers (SBT) was conducted from 10th to 17th January in ten training centers. A total of 3,835 SBTs were trained. Joint Operation Committee (JOC) was

formed for each training center, and it was composed of TDM/REB and SIIQS staff (administration), a UNICEF consultant, KOICA volunteers and NTs. Joint Operation Committee (JOC) teams shared information and communicated through WhatsApp (which is one of the most popular Social Networking Services in Rwanda), in centers so that they could solve problems on time. They challenged to overcome difficult situations such as equipment (projector) problems and nursing issues. The positive spirits advanced training modality and opened the training for mothers. Daily JOC reports also improved the overall training quality.

**(2) Progress of Output 2:** Problem-solving capacities are enhanced at school, sector, district, and national level

Mr.Antoine Mutsinzi and Mr. Sugiyama also shared with participants what have been achieved for output 2.

The National District CPD Committee (DCC) Forum was held on 26th January at Hilltop hotel, sponsored by JICA Rwanda Office and VVOB, aiming at promoting CPD/DCC. The program was developed by joint operation team of TDM/REB, SIIQS Project, and VVOB in a harmonized manner. 147 District Directors of Education (DDE), District Education Officers (DEOs), Sector Education Officers (SEOs), head teachers and School Based Trainers (SBTs) attended as well as development partners. A good CPD practice (Munyaga sector, Rwamagana district) was featured. Staff from REB, JICA, SIIQS, VVOB and BLF and a UNICEF consultant served as facilitators of a group work and roles of stakeholders involved in CPD were discussed.

Kayonza responded to the forum afterward, it officially sent an invitation letter to REB/SIIQS Project for DCC orientation and it was the first district where the project conducted an orientation upon its request. Eleven DCC members in Kayonza attended the orientation. The project also supported an orientation in Nyarugenge district whereby 57 members assembled. Key focus areas for those DCC support are promotion of CPD, capacity building for problem solving and data analysis.

The project introduced a special method for problem solving in orientation. Mr. Sugiyama reported the typical behavior of participants in districts is that they do not specify "whose problem" during problem solving practice and eventually they fail to specify "whose responsibility". Then they tend to conclude "REB or the Government of Rwanda should address issues". The method requested participants to find solutions that can be applied by themselves by specifying who, what, where, when, why and how. Participants were eager to know how they could identify educational problems faced in their areas, how they could analyze those problems and how they could proceed to find customized solutions.

As for the phase III CBC training for DDEs/DEOs/SEOs, the program was developed by a joint operation team of TDM/REB and SIIQS. Key focus areas were action planning of sector-based

training, instruction of online monitoring, capacity building for problem solving and capacity building for data analysis. The two-days long training was being conducted in three training centers in sequence, from 8th to 16th March. Trainings in Musanze and Muhanga were completed and it would be held in Rwamagana from the next day. Some Challenges were found in terms of ownership and commitment of districts and sectors. The majority of DDEs/DEOs/SEOs did not bring their laptop PCs even though they were told to bring their laptops to the training center. On the second day, a big number of them did not bring the training materials which were provided on the first day.

## 6. M&E OF THE PROJECT

### (1) JCC Membership and project team

Mr.Sugiyama presented to participants to confirm the new structure of the JCC membership and project implementation as the structures that the Ministry of Education and REB have recently changed.

### (2) Evaluation

Mr. Sugiyama told participants that both the overall goal and the project purpose are still premature for being evaluated. But he gave a summary of what have been achieved so far.

### (3) Risks

Mr.Mutsinzi and Mr. Sugiyama presented to participants both positive and negative risks that have tangible impacts on implementation of CPD.

Regarding the risks that the SIIQS Project identified, the fact that CPD and DCC were incorporated in the draft Education Sector Strategic Plan (ESSP) for 2018/19-2023/24 is a positive risk, in that there is a possibility to expand REB/TDM's contribution to education. Laptop PCs were distributed to all SEOs as a positive risk but the online monitoring is not being used sufficiently, which is a negative risk. There are also negative risks which are that teachers still apply conventional teaching style after two years of introduction of CBC, teachers are still thinking that group work is the only teaching method in CBC, some textbooks are still being developed and cascade trainings vary in terms of quality and organization.

Mr. Sugiyama emphasized that the urgent risk to consider is the quality control of the sector-based training. He explained results of pre and post evaluations which aimed to check if the trainees' mindset has changed or if their knowledge about the implementation of CBC has increased. Comparing the results of pre and post tests, it has been realized that there was a little improvement for some districts, for instance, Rulindo, Karongi and Kicukiro. For other districts the post test scores showed that there was an improvement even if it was not pleasant except Muhanga district.

The JCC participants wondered why Mr. Mutsinzi responded to them that the reason might be that the selected candidates were not competent enough for being SBTs.

**(4) Upcoming activities and way forward**

As a way forward for institutionalizing CPD, Mr. Sugiyama suggested the following:

- Integration of CPD in Imihigo (performance contract) which will enable CPD expansion and quality;
- DCCs as a platform of CPD have to be established and function in all districts;
- SIIQS Project will provide all SEOs with an excel sheet which will help them in analyzing national exam results;
- For SBT monitoring, the alternative Google monitoring is being prepared and it will be given to SEOs to monitor SBT activities while the online monitoring is being finalized.

## 7. QUESTIONS /ANSWER OPEN DISCUSSION

Mr. Nzitabakuze thanked the presenters for their cooperation and welcomed the participants' comments and questions. The following is the summary of discussion.

**JCC membership:** Mr.Nzitabakuze told participants that this issue will be discussed later.

Ms. Tusiime expressed the following concerns. She had to leave for other duties before the meeting ends and she asked participants to think about her concerns and come up with alternatives in the next JCC.

**Training for NT candidates:** During the training for NT candidates, only 100 out of 141 were qualified as NTs. The DDG asked what have been the criteria in selecting the qualified and not qualified ones.

Mr. Sugiyama responded to her that all participants were given a test and only those who passed the test were qualified as NTs.

**Monitoring:** The DDG also expressed her concern about how to monitor activities. How are we going to know what is happening down there, especially how are we going to monitor what is happening inside the classrooms? She encouraged participants to think how best CPD activities should be monitored and evaluated nationwide. This will make it easier for REB and development partners to have a real picture of what is happening and provide supports if necessary.

Mr.Mutsinzi and Mr.Sugiyama responded that the online monitoring is not working and SEOs are not using it. The ICT department is still working on it to make it functional. This makes it not easier to grasp the CPD situation nationwide. It is in this regard that the Google monitoring which is very simple and accessible for all SEOs is being designed. SEOs will use this platform to upload all data

related to CPD activities and REB will be able to access that information, therefore REB will be able to provide any support if needed.

**Stakeholders' engagement in CPD:** The DDG also expressed her concern about how we are going to make sure SEOs, head teachers and teachers are engaged in CPD. This goes hand in hand with monitoring and evaluation.

**Quality of training:** About the quality of training, the DDG was surprised with the quality of participants in the trainings which is low at both national and sector levels and she urged to go deep, find out the reasons and thereafter give feedback to districts.

Mr. Mutsinzi responded that during the DDE/DEO/SEO training, the results of evaluation of NTs and SBTs were shared with participants for training quality control. As one of the training items was problem solving, the issue was transferred to them so that they could go on the ground and find out the root causes and possible solutions by themselves.

**Plan of Activities:** Mr. Nzitabakuze said that he expected to have a plan of activities in JCC but unfortunately not.

Mr. Sugiyama responded to him that SIIQS Project does not have a separate budget for CDP activities. It only provides technical expertise support, therefore the project team and Mr. Nzitabakuze proposed that REB will sit together to make a plan.

## 8. FAREWELL PRESENTATION FROM PROGRAM ADVISOR OF JICA RWANDA OFFICE

During his presentation, Mr. Shuhei Saikawa asked participants the following question "To whom should we be accountable most?" He said that we should be accountable to the Government of Rwanda when it comes to what have been planned and agreed upon. Referring to Munyaga success stories, he told participants that we should be also accountable to learners' parents. But mostly we should be accountable to learners. He gave four recommendations:

1. Think about whom we are accountable most, "learners". He recommended all the participants to be concerned of what is happening inside classrooms;
2. Refocus on the role of SEOs, they are the ones to push schools to plan and implement CPD activities. It is very effective to focus on them so that CPD activities could be implemented at sector and school levels;
3. Start encouraging teachers to use quick and short question after each session to make sure children have understood what s/he has taught them;
4. Make all teachers competent so that they will think for themselves and identify what they need. CPD is very important to achieve all this.

## 9. AOB

As he was leaving Rwanda, Mr. Saikawa appreciated Rwanda for good collaboration with Japan and he took this opportunity to say good bye.

## 10. CLOSING REMARKS

As the DDG had left by the time being, Mr. Nzitabakuze ended the meeting by appreciating the activities implemented by SIIQS Project so far, and all the participants for their great contributions toward the achievements of the project targets and, thus the achievement of teaching and learning. He also thanked JICA for its continuous cooperation and partnership with REB. He invited participants for a health break for more discussions and collaboration. The meeting officially adjourned at 17:30.

Done at Kigali, 14th March 2018

Angelique TUSIIME
Chairperson of the Meeting
DDG, REB

Ryuichi SUGIYAMA
Team Leader
SIIQS Project

# Appendix 20. Minutes of the 4th JCC

**THE PROJECT FOR SUPPORING INSTITUTIONALIZING AND IMPROVING QUALITY OF SBI ACTIVITY (SIIQS)**

**MINUTES OF THE FOURTH JOINT COORDINATION COMMITTEE (JCC)**

**I. DATE AND TIME:** 23th January 2019 from 15:30-17:30

**II. VENUE:** TDM&CGC Boardroom

**III. ATTENDANCE:** Annexed

**IV. AGENDA**

| | | |
|---|---|---|
| 15:00 - 15:10 | Welcome Address | REB/JICA |
| 15:10 - 15:20 | Introduction of JCC members | |
| 15:20 - 15:30 | Background of the project | Mr. Ryuichi SUGIYAMA |
| 15:30 - 15:45 | Progress of Output 1<br>• Lesson improvement<br>• Online CPD Course | Mr. Hashituky HABIYAREMYE |
| 15:45 - 16:00 | Progress of Output 2<br>- DCC Formation | Ms. Clarisse DUSABIMANA |
| 16:00 - 16:40 | Annual activity plan of the project<br>- Outline<br>- Open day<br>- Revision of PDM | <br>Mr. Gerard MURASIRA<br>Mr. Ryuichi SUGIYAMA<br>Mr. Ryuichi SUGIYAMA |
| 16:40 - 16:50 | Question and Answer | |
| 16:50 - 16:55 | AOB | |
| 16:55 - 17:00 | Closing Remarks | |

## 1. INTRODUCTION

The 4th Joint Coordination Committee (JCC) meeting was held at the boardroom of the Department of Teacher Development & Management and Career Guidance & Counselling (TDM&CGC), Rwanda Education Board (REB) on 23th January 2019. It started at 15:30. The meeting was co-chaired by Ms. Angelique Tusiime, Deputy Director General (DDG) of REB, and Mr. Tomonori Nagase, Senior Representative of Japan International Cooperation Agency (JICA).

## 2. OBJECTIVES OF THE MEETING

Mr. Gerard Murasira, the director of Teacher Training Unit, on behalf of the Head of TDM&CGC and Project Manager of the Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS Project), welcomed participants and he thanked them for dedicating their time to the 4th JCC meeting of SIIQS Project. He introduced to participants the purposes of the meeting, which were;

1) To report the progress and achievements of the project
2) To inform upcoming activities
3) To discuss the problems and issues

## 3. OPENING REMARKS

Opening remarks were given by Ms. Tusiime on behalf of DG who was not able to attend the meeting as chair. She welcomed invitees in REB and thanked the participants of the 4th JCC meeting of the SIIQS Project. She appreciated JICA for working closely with REB especially through SIIQS Project that dedicated its efforts on school-based in-service trainings. The DDG pointed out that to be a good teacher, it is clear that CPD is very essential and she appreciated SIIQS for efforts that it has been producing in promoting SBI and CDP in general. Especially she thanked JICA/SIIQS Project team for how it has been bringing a huge contribution in improving the quality of education in Rwanda through providing technical expertise and building capacity of

Rwandan teachers for enhancing their understanding on Competence Based Curriculum (CBC). She called every participant's attention, to be active and engaged in the meeting so that it could achieve its objectives.

Mr. Nagase started by thanking REB for its continuous and good collaboration with JICA and SIIQS project in particular. He reminded participant that SIIQS Project is in its final year and this 4th JCC is a good occasion to consider both progress and challenges that faced the Project in order to take the next steps. "It is important to review the current status of the project and think about the next step", he said. Mr. Nagase emphasized on Continuous Professional Development (CPD) which is now the second priority of the Education Sector Strategic Plan (ESSP 2018-2023) to improve quality of education. He pointed out that, according to the World Bank, Rwandan children on average complete only 3.8 years of learning. This means that average Rwanda children do not graduate elementary education. This is a serious issue and quick response is needed. Among many possible reasons behind this is that learners do not understand lessons. This means that teacher is the person who can change this situation. This necessitates effective CPD.

## 4. INTRODUCTION OF JCC MEMBERS

Mr. Ryuichi Sugiyama, the Team Leader of SIIQS Project, explained to participants that the JCC is the steering committee of the project that monitors progress of activities and leads discussions to take necessary actions against the raised issues to keep the project on the right track. Members of the JCC were stipulated under the Record of Discussion of the SIIQS Project, which is a bilateral agreement between REB and JICA. The official members were assigned from both sides. In addition, both sides are allowed to invite person(s) who may contribute to the project, if necessary.

## 5. BACKGROUND OF THE PROJECT

Mr. Sugiyama introduced participants to the background of the project. He cited that changing teachers' classroom practices requires an incremental change over a sustained period, supported by coaching activities of peers, heads of departments and external agencies. A more attention should be given to CPD rather than teachers training. Mr. Sugiyama recalled participants that ESSP 2018-

2023 has also prioritized CPD as one of the strategies to achieving the quality of education through implementing CBC. SIIQS Project was put in place to support and promote CPD at central and grass root levels. He told that the Project was intended to attain two outputs so that CPD could be institutionalized; (1) Teachers' understanding of CBC-based lesson implementation is enhanced, and (2) Problem-solving capacities are enhanced at school, sector, district and national level. SIIQS Project is using two key approaches to contribute to National CPD framework, which are to model CPD through Lesson Study and to establish CPD support mechanism through partnership with local authorities.

Mr. Sugiyama concluded that, given the increased performance of schools where CPD has been practiced, CPD will yield great fruits in terms of implementing CBC and improving the quality of education in general. He emphasized this with tangible facts by giving examples of schools.

## 6. PROJECT PROGRESS

### (1) Progress of Output 1

***Lesson improvement through Lesson Study***

Lesson Study is one of activities that have been conducted by SIIQS Project to achieve Output 1. Mr. Hahituky Habiyaremye, the Monitoring Officer of the Project, explained participants what Lesson Study is and what have been achieved through it in improving the quality of lessons and schools' performance in general. Lesson Study is a new concept in Rwanda but it has 100-year history in Japan. He explained that Lesson study has been piloted in seven Rwandan schools, namely EP Buhande (Rulindo district), Lycée Notre Dame de la Visitation (Rulindo district), G.S Apagie Musha (Rwamagana district), G.S St Aloys Rwamagana (Rwamagana district), G.S Kabuye Catholique (Gasabo district), G.S Notre Dame des Apôtres Rwaza (Musanze district) and G.S Mukarange Catholique (Kayonza district).

In the schools mentioned above, Lesson Study has significantly contributed to lesson improvement as evidenced by improved performance.

***Online CPD course on CBC***

The online CPD course on CBC was designed to help teachers to continuously learn anywhere at



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any time for improving their classroom practices. This course was designed based on CBC training content of the past three phases with the following main objectives;

1) To provide teachers with opportunity to learn and improve their practice toward CBC implementation
2) To help teachers review the CBC content and assess themselves
3) To facilitate REB in assessing teachers' level of understanding on CBC and monitoring teachers' competences to provide appropriate support on time.

Mr. Habiyaremye explained the structure and the functionality of the platform. The course was made up of four units. Teachers must read through each unit and respond to an assessment question before proceeding to the next unit. The assessment is composed of quizzes and an essay question. A workshop for piloting this course was conducted for two days in November 2018 to check its functionality and collect feedback to make it fit for purpose. 60 teachers from all over the country gathered at Teacher Training College (TTC) Muhanga to try the course and gave feedback. Mainly the teachers appreciated the course and confirmed that it could accelerate CPD. SIIQS Project will develop a rollout plan to be approved by the DG REB and continue to monitor teachers' progress.

**(2) Progress of Output 2**

Ms. Clarisse Dusabimana, the Programme Officer of the Project presented progress regarding Output 2. Strong coordination, effective planning, monitoring and reporting on CPD activities at sector and school level are essential for CPD to be successful and bear expected results. Since 2017, SIIQS project has been supporting formation of District CPD Committees (DCCs) in 14 districts. The Project support to enhance DCCs' capacity is divided into three areas;

***1) DCC orientation workshops***

DCC members were explained the concept and membership of DCC. They were also made aware of DCC's key roles and responsibilities which are summarized into four categories; Planning, Monitoring and Evaluation, Review and Learning, and Reporting of CPD related activities in the district.

*2) Planning workshops*

DCC members developed an action plan through following three steps.

- **Problem Analysis**

  DCC members identified and analyzed different problems that were affecting quality of education in their district. DCC members were able to identify their problems and figured out why a problem was happening using a "problem tree".

- **Objective Analysis**

  The objective of this is to examine the solution to the problems identified in Problem Analysis. DCC members capacity to set a core objective and analyze different means and strategies to achieve it was enhanced.

- **Action plan development**

  Results from Problem and Objective Analysis were extracted to develop an action plan. Their capacity in setting achievable and measurable objectives and outputs was enhanced.

*3) Monitoring*

For the purpose of examining achievement from planned DCC activities, SIIQS Project has introduced the Most Significant Change (MSC) as M&E technique. This technique was introduced in Gasabo and Rulindo so far.

SIIQS Project has been working closely with other development partners such as BLF, Wellspring, VVOB, Soma Umenye, IEE, Educate! to promote harmonization in supporting DCC. Through a number of workshops SIIQS Project has contributed to the design of DCC support as common approach among development partners and shared some tools namely; Problem and Objective Analysis tool and Action plan development tool. Together with BLF, a DCC online monitoring system is being developed.



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## 7. ANNUAL ACTIVITY PLAN OF THE PROJECT

### (1) Outline of the project work plan

Mr. Murasira presented the Project work plan for 2019, recalling the participants that SIIQS is a three-year project, and this is the third and last year. The Project is divided into three phases and each phase has the duration of one year. Phase one (2017) was particularly for preparation. During this phase different materials were developed, training of core trainers on CBC were conducted and a DCC guideline was developed. Cascade training on CBC were conducted, and DCCs/SCCs were operationalized in phase two (2018). Mr. Murasira emphasized that in phase three (2019), the Project will concentrate its efforts on monitoring and evaluation. The focus will be on;

1) Measurement of teachers' and learners' achievements
2) Monitoring DCCs/SCCs and
3) Sharing good practice

Then Mr. Murasira showed work breakdown for 2019 and the participants appreciated that it was well structured. The participants agreed that the Project Design Matrix (PDM) of the Project would be revised accordingly.

### (2) Open day

Mr. Sugiyama informed the participant about the Open Day Demonstration event which is planned for Wednesday 13th February at G.S Kabuye Catholique in Gasabo District. Ms. Tusiime asked for more clarification regarding how an Open Day is conducted in Japan and what motivates teachers to participate in. Mr Sugiyama replied that an Open Day in Japan is very common, schools organize at the beginning of each term and there are National Open Days as well. He also clarified that an Open Day is subject based. Regarding what motivates teachers to attend it, he answered that teachers apply for participation and even pay high fees because the more they participate in and learn from other teachers, the more they become a good teacher and this will be the basis for being promoted. The Open Day event in Rwanda was clearly introduced and favourably received by all the participants.



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## 8. QUESTION AND ANSWER

Mr. Murasira appreciated all the presentations and welcomed the participants' comments and questions. Following is the summary of discussion.

Ms. Tusiime, DDG REB asked how Munyaga sector in particular and other schools practicing CPD have been able to manage CPD activities given common challenges for Rwandan schools such as overloaded timetables, and how CPD can be institutionalized? Mr. Sugiyama responded to her that Munyaga sector had a Sector Education Officer (SEO) who championed promotion of CPD. The SEO had made much effort in encouraging schools to practice CPD. Once CPD outcomes are known and teachers clearly understand how it will contribute to improved school performance, time is no longer a challenge, CPD becomes one of teachers' duties. The schools have organized a wide range of CPD activities. They use free time like early morning before starting class, the free time between the first and the second shift for CPD activities because they know its importance in improving their performance. Mr. Habiyaremye and Mr. Kizito Ndihokubwayo, the other Monitoring Officer of the Project, also illustrated that some schools have been able to explore their timetables and find spare time reserved for CPD.

Dr. Andre Muhirwa, Director of the Centre for Teaching and Learning Enhancement at University of Rwanda College of Education (UR-CE), suggested that both REB and JICA should sit together and see how SIIQS Project can be turned into a sustainable program, given its importance. Mr. Sugiyama clarified that, as Mr. Murasira mentioned, the 3rd year of the project more focuses on analyzing outcome of the Project. After evaluating the CPD model project piloting, findings will be shared and discussed, and stakeholders will see if the Project can be expanded.

## 9. AOB

There was no AOB.

## 10. CLOSING REMARKS

Closing remarks were given by Dr. Muhirwa on behalf of UR-CE Principal, Mr. Naganse, JICA Senior Representative, and Ms. Tusiime, DDG REB.

Dr. Muhirwa greatly appreciated the good initiative and efforts for enhancing teachers' competences to implement CBC through CPD. He offered any support necessary to promote CPD activities as UR-CE and hoped that the Project would be transformed into a long-lasting program.

Mr. Nagase encouraged REB to promote teachers' motivation toward CPD. It is not good to force teachers to do CPD but the key approach to effective CPD is to motivate teachers to see positive sides of practicing CPD and independently think what is better for themselves.

Ms. Tusiime underlined that everyone is talking about quality of education. Quality of education implies quality teachers' CPD. SIIQS Project is much contributing to promotion of CPD. REB appreciated that because whatever development partners are doing is what REB is supposed to do. REB expects that SIIQS Project will give recommendations on how CPD could be made effective for achieving REB's main goal, "improved quality of education". She expressed her gratitude to participants for their attention and engagement in the 4th JCC. The meeting officially adjourned at 17:00.

Done at Kigali, 23rd January 2019

RWANDA EDUCATION BOARD (REB)

Angelique TUSIIME

Chairperson of the Meeting

DDG, REB

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For

Ryuichi SUGIYAMA

Team Leader

SIIQS Project



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# Appendix 21. Minutes of the 5th JCC

**THE PROJECT FOR SUPPORING INSTITUTIONALIZING AND IMPROVING QUALITY OF SBI ACTIVITY (SIIQS)**

**MINUTES OF THE FIFTH JOINT COORDINATION COMMITTEE (JCC)**

**I. DATE AND TIME**: 23rd July 2019 from 9:30-11:30

**II. VENUE**: REB Boardroom

**III. ATTENDANCE:** Annexed

**IV. AGENDA**

| | | |
|---|---|---|
| 9:30 -9:40 | Welcome Address | REB/JICA |
| 9:40 - 9:50 | Introduction of JCC members | |
| 9:50 - 10:05 | Revision of Project Design Matrix (PDM) | Mr. Ryuichi SUGIYAMA |
| 10:05 - 10:20 | Progress of Output 1<br>· Lesson improvement in model schools | Mr. Hashituky HABIYAREMYE<br>Mr. Kizito NDIHOKUBWAYO |
| 10:20 - 10:35 | Progress of Output 2<br>· DCC/SCC monitoring | Ms. Clarisse DUSABIMANA |
| 10:35 - 10:50 | Preliminary findings of the Endline Survey<br>· Framework of the ELS<br>· Findings<br>· Lessons Learned | Mr. Ryuichi SUGIYAMA |
| 10:50 - 11:00 | Upcoming Activities<br>· DCC/SCC monitoring<br>· Project closing seminar | Mr. Ryuichi SUGIYAMA<br>Mr. Gerard MURASIRA |
| 11:00 - 11:20 | Question and Answer | |
| 11:20- 11:25 | AOB | |
| 11:25 - 11:30 | Closing Remarks | REB/JICA |

## 1. INTRODUCTION

The 5th Joint Coordination Committee (JCC) meeting was held at REB boardroom on 23th July 2019. It started at 9:30 and ended at 11:30. The meeting was chaired by Ms. Angelique Tusiime, Deputy Director General (DDG) of REB.

## 2. OBJECTIVES OF THE MEETING

Ms. Emerthe Kabatesi, TTC Teacher Training officer, welcomed participants and she thanked them for dedicating their time to the 5th JCC meeting of SIIQS Project. She introduced to participants the purposes of the meeting, which were;

(1) To report the revision of Project Design Matrix (PDM)

(2) To share the preliminary findings of the end line survey (ELS)

(3) To report the progress of the project

(4) To report upcoming activities towards the end of the Project in December

(5) To discuss the problems and issues

## 3. OPENING REMARKS

Opening remarks were given by Ms. Tusiime, on behalf of DG who was not able to attend the meeting as chair. She welcomed invitees in REB and thanked the participants of the 5th JCC meeting of the SIIQS Project. Also, special welcome was given to MINEDUC representatives who attended the meeting for the first time. She appreciated JICA for working closely with REB especially through SIIQS Project that dedicated its efforts in lesson improvement. The DDG told participant that JCC meeting is a good occasion for different education stakeholders to learn from what SIIQS Project is doing, what have been achieved so far, challenges, lessons learnt and recommendation for scaling up. She thanked JICA/SIIQS Project team the contribution in improving the quality of education in Rwanda through providing technical expertise and building capacity of Rwandan teachers for enhancing their understanding on Competence Based Curriculum (CBC). She called every participant's attention, to be active and engaged in the meeting so that it could achieve its objectives.

Mr. Shin Maruo, Chief Representative of JICA Rwanda, started by thanking REB for its continuous and good collaboration with JICA and SIIQS Project in particular. In his remarks, he emphasized

that JICA Rwanda is committed in supporting Rwandan education sector especially in basic education. He said that REB and JICA have been collaboratively and jointly implementing different projects for improving teaching and learning practices and consequently improving the quality of education. From Strengthening Mathematics and Science in Secondary Education (SMASSE) project to School-based Collaborative Teacher Training (SBCT) project and from SBCT to SIIQS. JICA is pleased to support Rwanda to achieve it ambitious goal which is to have a knowledgeable and skilled population. He reminded participants that SIIQS Project is near to its close-out and that JICA is ready to receive REB's proposal for the next project by August 2019. The 5th JCC was a good occasion to consider both progress and challenges that the project has faced, in order to take the next steps. "It is important to review the current status of the project and think about the next step", he said. Mr. Maruo emphasized how important the meeting was and that their attention and participation is invaluable.

## 4. INTRODUCTION OF JCC MEMBERS

Mr. Ryuichi Sugiyama, the Team Leader of SIIQS Project, explained to participants that the JCC is the steering committee of the project that monitors progress of activities and leads discussions to take necessary actions against the raised issues to keep the project on the right track. Members of the JCC were stipulated under the Record of Discussion of the SIIQS Project, which is a bilateral agreement between REB and JICA. The official members were assigned from both sides. In addition, both sides are allowed to invite person(s) who may contribute to the project, if necessary.

## 5. SIIQS PROJECT APPROACH

Mr. Sugiyama shared with participant the overview of the SIIQS Project and its approach. The main purpose of the project is to institutionalize CPD. The project has two outputs namely;

1. Teachers' understanding of CBC-based lesson implementation is enhanced, and
2. Problem-solving capacities are enhanced at school, sector, district and national level.

Changing teachers' classroom practices is a 4-stage cycle, not a one-shot activity. It has to be continuous. As the first stage (Plan); teachers identify the problems they face in teaching and plan

to overcome them. Problems could be for example; teaching difficult topics or just improving own teaching and improving learning outcomes. In the second stage (Practice), teachers do rehearsals, preparing lessons and materials. In the third stage (Play), teachers do live teaching in classrooms and in the fourth stage (Review), the work done is evaluated against the desired situation and restart the cycle again. Mr. Sugiyama compared this approach with a professional football team which intends to achieve its goals.

Mr. Sugiyama informed participants that the PDM is being revised to be more objectively verifiable and measurable. The Objectively Verifiable Indicators (OVIs) are being revised as shown in the following table. REB and JICA will seat together to agreed on the revised version and approve it.

| Narrative Summary | Objectively Verifiable Indicators |
|---|---|
| **Overall Goal** | |
| Students' learning process in classroom is improved. | 1) More students in a model school than those in a control school present relevant responses to an open question posed by a teacher. |
| | 2) Result of the academic achievement test developed by the Project improves more in model schools compared to control schools. |
| **Project Purpose** | |
| Implementation of CBC-based lesson in the classroom is strengthened through SBI activities. | 1) Lesson plans developed by teachers in model schools include all elements specified in Competence 2.1 of the National Teacher CPD Framework. |
| | 2) Teachers give more open questions in model schools compared to control schools. |
| **Outputs** | |
| 1. Teachers' understanding of CBC-based lesson implementation is enhanced. | 1) Post-test results of participants in trainings and workshops including an e-learning course exceed 70%. |
| | 2) Self-evaluation of teachers' understanding of CBC-based lessons continues to be 90% or above. |
| 2. Problem-solving capacities are enhanced at school, sector, district, and national level. | 1) All sectors implement sector-based CBC training. |
| | 2) More than one good practice of school-based CPD is reported quarterly from all DCCs that have been established. |
| | 3) The rate of teachers' participation in school-based CPD increases from 75% (baseline) to 90%. |
| | 4) More than 50% of DCCs and SCCs submit monitoring reports using a developed form on monthly basis. |

## 6. PROJECT PROGRESS

### (1) Progress of Output 1

***Lesson improvement through Lesson Study***

Lesson Study is one of activities that have been conducted by SIIQS Project to achieve Output 1. Mr. Hahituky Habiyaremye, the Monitoring Officer of the project, explained to participants what Lesson Study is and what have been achieved through it in improving the quality of lessons and schools' performance in general. He explained that Lesson Study has been piloted in six model schools, namely EP Buhande (Rulindo district), G.S APAGIE Musha (Rwamagana district), G.S St Aloys Rwamagana (Rwamagana district), G.S Kabuye Catholique (Gasabo district), G.S Notre Dame des Apôtres Rwaza (Musanze district) and G.S Mukarange Catholique (Kayonza district). In the schools mentioned above, Lesson Study has significantly contributed to lesson improvement as evidenced by improved performance.

***School exchange visits and Sharing workshop***

SIIQS Project organized a sharing workshop which gathered teachers from all model schools, SEOs of sectors and DDEs of districts where model schools are located. The objective of this workshop was to get them to share their views towards CPD with stakeholders in education sectors and learn from each other. During this workshop, teachers and their leaders proposed having exchange visits among them to learn and share experiences for lesson improvement. Mr. Habiyaremye reported to participants on these exchange visits, which were scheduled on 22$^{nd}$ and 30$^{th}$ June 2019. Teachers from G.S Mukarange Catholique (Kayonza) and EP Buhande (Rulindo) exchanged visits and teachers form G.S APAGIE Musha (Rwamagana) and G.S Notre Dame des Apôtres Rwaza (Musanze) exchanged visits as well. ***(See exchange visits scheduled in Lesson Study presentation attached)***

All teachers who participated in these visits appreciated it and confirmed that they have had opportunity to learn from their fellow in terms of lesson improvement.

### (2) Progress of Output 2

Ms. Clarisse Dusabimana, the Programme Officer of the project presented progress regarding Output 2. Strong coordination, effective planning, monitoring and reporting on CPD activities at sector and school level are essential for CPD to be successful and bear expected results. Since 2017,

SIIQS Project has been supporting formation of District CPD Committees (DCCs) in 15 districts. The project support to enhance DCCs' capacity is divided into three areas;

*1) DCC orientation workshops*

DCC members were explained the concept and membership of DCC. They were also made aware of DCC's key roles and responsibilities which are summarized into four categories; Planning, Monitoring and Evaluation, Review and Learning, and Reporting of CPD related activities in the district.

*2) Planning workshops*

DCC members developed an action plan through following three steps.

- **Problem Analysis**

  DCC members identified and analyzed different problems that were affecting quality of education in their district. DCC members were able to identify their problems and figured out why a problem was happening using a "problem tree".

- **Objective Analysis**

  The objective of this is to examine the solution to the problems identified in Problem Analysis. DCC members capacity to set a core objective and analyze different means and strategies to achieve it was enhanced.

- **Action plan development**

  Results from Problem and Objective Analysis were extracted to develop an action plan. Their capacity in setting achievable and measurable objectives and outputs was enhanced.

*3) DCC/SCC Monitoring*

Ms. Dusabimana shared what SIIQS Project has been doing in terms of supporting DCC/SCC monitoring and evaluation. SIIQS has designed DCC/SCC reporting forms (Excel form) to be used by DCC/SCC for reporting on CPD activities on a monthly basis in collaboration with TDM&CGC/TTU. REB/TTU distributed the forms to DDEs in mid-April. DDEs were requested to send SCC report form to SEOs and reports were expected to be submitted on 7th of the next month. Apart from monthly reporting, the quarterly monitoring visit was contrived to give feedback and

collect more data especially qualitative and suggestive. The monthly reporting tools were piloted in five districts namely; Rulindo, Kayonza, Gisagara, Kirehe and Rwamagana. The collected information was analyzed to be a basis for the first quarterly monitoring visits. The first quarterly monitoring visits were conducted in five sectors; three sectors from Rulido district, one sector from Kirehe district and one sector from Gisagara district. These visits revealed that;

- Different CPD activities are being implemented, but there is still a gap in reporting. There is no demand for CPD reports from districts. Sometimes SEOs make reports and send them to district but there is no feedback.
- There are still gaps in the coordination between DCC and SCCs
- CPD time is still a big challenge to implement school-based CPD.
- School management support was also a big challenge for CBC implementation

Since the approval of the DCC/SCC monitoring in end March, no monthly report from SEOs and DDEs was received. This is a big challenge for DCC/SCC to be functioning as well as REB and partners to monitor CPD at ground levels (schools and sectors). In collaboration with other DPs, SIIQS keeps encouraging DCCs and SCCs to monitor and report CPD activities, which will result in effective implementation of CPD programs.

**PLERIMINARY FINDINGS OF THE ENDLINE SURVEY**

Mr. Sugiyama shared with participants the preliminary findings of the endline survey (***See the endline survey and achievement presentation attached)***. The purpose of this survey was (1) to assess change of attainment in math and science, (2) to monitor change of CBC lessons and (3) to collect qualitative information about CBC lesson improvement and implementation of CPD. The target population was in three categories namely; students, teachers and head teachers (HTs). The survey was conducted in eleven schools amongst which six model schools serve as experimental/ treatment and the other five serve as control schools. The tools used for data collection were; Academic Achievement Tests (AAT), lesson plans, lesson observation sheets and video shoot, semi-structured interview and questionnaire.

5,017 students in P6, S3 and S6 sat for AAT math and sciences/SET, 40 lessons were observed and video shot, eleven HTs were interviewed, 101 teachers and eleven HTs questionnaires were

responded and 96 teachers participated in interview.

Mr. Sugiyama told participants that the analysis of end line data is ongoing but so far it has revealed improvements especially in the following;

- **Lesson plan**: Lesson planning was improved, especially in view of elements specified in the National Teacher CPD Framework; (1) clear and measurable objectives and activities to achieve them, (2) learning outcomes and objectives support learners to move from simple and familiar to more complex and sophisticated knowledge and skills, (3) regular revision of learning and assessment, (4) adaptation for specific learners and (5) use a range of teaching and learning resources and vary interaction patterns. The analysis of lesson plans is ongoing but so far it shows some improvement in model schools.
- **Teachers' Questioning**: The baseline data showed that most of the teachers in model schools mostly used closed questions in assessing learners. The end line showed that the way teachers formulate questions keeps changing. Now they try to ask more open questions that can help learners think critically.
- **Students' responses**: The end line revealed that students are now confident to express themselves during a lesson. Be it asking questions to teachers or discussing with their fellow students. Yes /No responses have been decreased.
- **CBC understanding**: Approximately 93% of teachers who participated in the survey confirmed that they really understand the concept of CBC. Though some CBC misconceptions were identified.
- **CPD implementation:** CPD was conducted in all eleven schools that were visited during end line survey. 54% of 101 surveyed teachers said that CPD is on their timetable. 95% of surveyed teachers attended CPD (regularly: 69%, Sometimes: 26%)

## 7. SIIQS PROECT'S UPCOMING ACTIVITIES

Mr. Sugiyama shared the upcoming activities to be performed in the project's remaining time.

## 8. QUESTION AND ANSWER SESSION

Ms. Kabatesi appreciated all the presentations and welcomed the participants' comments and questions. Following is the summary of discussion.

Ms. Tusiime, DDG REB appreciated what have been achieved by the project especially the improvement in teachers' questioning, lesson planning and how CPD is being conducted. She emphasized the role of lesson to improving teaching practices and learning outcomes. She asked to which extent school leaders (HTs and DOS) have been involved and own Lesson Study and CPD in general. Mr. Antoine Mutsinzi, Education Advisor of the project, responded that HTs and DOS in schools where Lesson Study is conducted are very committed to support it. They do their best to motivate teachers to participate and they also provide time.

Ms. Tusiime also asked if Lesson Study could be sustainable after SIIQS Project closes out. Mr. Sugiyama responded that he believes that schools will continue to conduct Lesson Study because school leaders appreciate it and support it. The other key factor to Lesson Study sustainability is that teachers understand it and are aware of what they will get from it. Mr. Sugiyama also said that SIIQS Project is working on Lesson Study guidelines that will help school continue with it, though external resources are still needed to come in and support school. He also emphasized on the role of School-Based Mentor (SBM).

Mr. Norihide Furukawa, Program Adviser for Education and Vocational Training of JICA, emphasized on the revision of the Project Design Matrix (PDM) which is urgent and to be done by REB and JICA. Regarding DCC/SCC monitoring, he informed participants that JICA opened discussion with MINEDUC/Department of Basic Education Quality Assurance to see how CPD can be incorporated in monthly reports to be submitted to MINEDUC by SEOs.

Mr. James Ngoga, HoD of TDM&CGC shared with participants his experience in open day organized by REB, JICA and DCC Gasabo. He said that this event was really a constructive one in terms of improving lessons and teaching practices in Rwandan schools. Mr. Ngoga proposed that Lesson Study be extended to other schools as well. Regarding DCC/SCC monitoring Mr. Ngoga told participants that sometimes SEOs could be confused by several reporting forms from different DPs but through collaboration with DPs, monitoring will be harmonized and SEOs will be oriented and encouraged to effectively monitor CPD activities. He told participants that in collaboration with DPs, REB is planning to a workshop on 1st August,2019 in which users will participate in designing DCC/SCC monitoring tools to be more user friendly.

In accordance with Mr. Ngoga's proposition to extend Lesson Study to other schools, Mr.

Furukawa said that JICA Rwanda is open to discuss the next project with REB.

Mr. Furukawa also asked participants if everyone is happy with the presented upcoming activities to be performed by SIIQS Project. Mr. Ngoga responded that upcoming activities are equally important and hence should be conducted. Also. Ms. Kabatesi said that activities are essential and TTU shall collaborate as usual.

Dr. Andre Muhirwa, Director of the Centre for Teaching and Learning Enhancement at University of Rwanda College of Education (UR-CE), proposed that issues and challenges met in SIIQS Project implementation be highlighted in the end line report.

**9. AOB**

There was no AOB.

**10. CLOSING REMARKS**

Mr. Ngoga, on behalf of DDG REB closed the meeting; In his remarks he thanked all the participants and promised continuous collaboration between JICA and REB. The meeting was officially adjourned at 11:30 am.

Done at Kigali, 23rd July 2019

for Ryuichi SUGIYAMA

Team Leader

SIIQS project

Angelique TUSIIME

Chairperson of the Meeting

DDG, REB

RWANDA EDUCATION BOARD - REB

# Appendix 22. ICET 2017
# Presentation Material

# Bridging the Gap between Policy and Practice: The Case of Competency-Based Curriculum in Rwanda

Antoine MTSINZI[1], Yumiko ONO[2], Ryuichi SUGIYAMA[3], Kyoko YOSHIKAWA[3] & Sayaka MATSUZUKI[3]

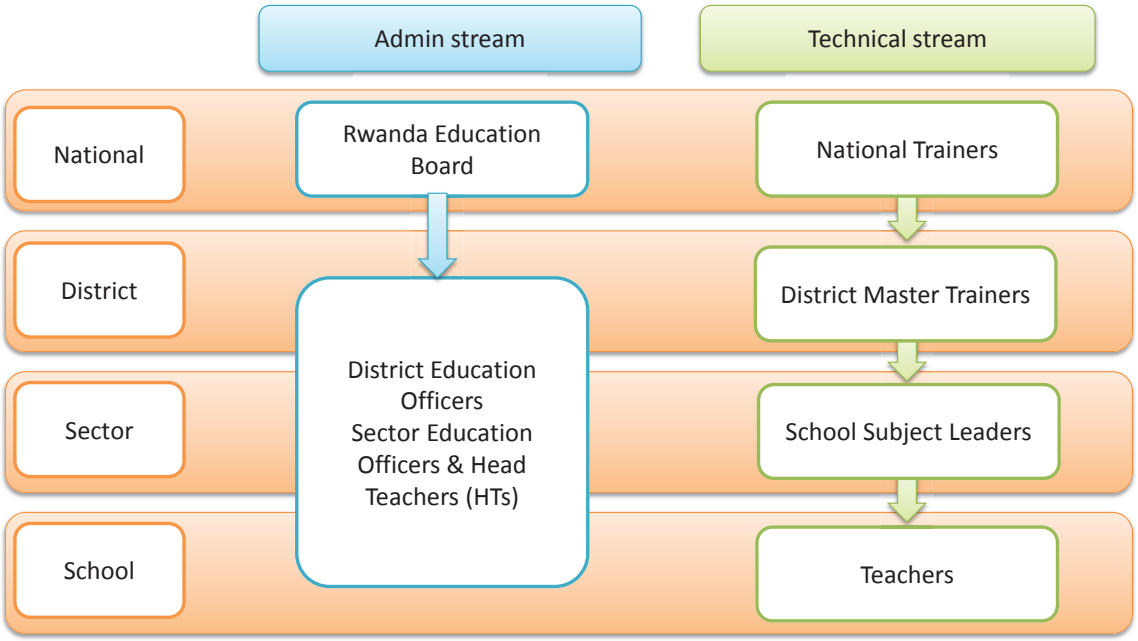
[1]Rwanda Education Board, Kigali, Rwanda,
[2]Naruto University of Education, Japan,
[3] PADECO Co. Ltd., Japan

PADECO Co., Ltd.
http://www.padeco.jp/jp

# Background

- Increasing training needs for teachers, especially after the extension of basic education from 6 years to 9 years (2009) and 12 years (2012) and change of medium of instruction to English in 2008
- Introduction of Competence-based Curriculum (CBC) to all levels of basic education (pre-primary to upper secondary) in 2016
- CBC induction training for all teachers in three phases from 2015 to 2017
- Induction training involves cascading model + school-based trainings
- Rwanda Education Board (REB) & Japan International Cooperation Agency (JICA) implementing a project to support teacher training for CBC (SIIQS Project, 2017-2019).

# Training mechanism for CBC induction






# Objectives of Study

- To assess the implementation status of first phase of CBC induction training
- To provide suggestions / recommendations to ensure all teachers' participation in the future training framework

# Methodology

- Monitoring survey (Census)
  - Conducted in July 2016
  - Monitoring form to all District Education Officers (30)
- Field Survey (Sampling survey)
  - Conducted in March 2017
  1. **Questionnaire:** HTs, **teachers** and students
  2. Focus group interview: HTs, teachers and students
  3. Lesson observation: Math and Science

| Sample size | No. of schools | Questionnaire | | | Focus Group Interview | | | Lesson Observation |
|---|---|---|---|---|---|---|---|---|
| | | HT | Teacher | Student | HT | Teacher | Student | |
| TOTAL | 20 | 20 | 178 | 985 | 20 | 139 | 530 | 20 |



# Attributes of Samples (Teachers)

| | All | | | | | Male | | | | | Female | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *N* | Age | | Years of Teaching Experience | | *N* | Age | | Years of Teaching Experience | | *N* | Age | | Years of Teaching Experience | |
| | | *Ave.* | *SD* | *Ave.* | *SD* | | *Ave.* | *SD* | *Ave.* | *SD* | | *Ave.* | *SD* | *Ave.* | *SD* |
| Primary | 86 | 38.8 | 10.7 | 15.4 | 10.5 | 60 | 39.5 | 11.1 | 16.9 | 11.0 | 26 | 37.1 | 9.8 | 11.5 | 8.2 |
| Secondary | 92 (2) | 35.3 | 8.0 | 9.5 | 7.5 | 30 | 35.2 | 8.1 | 10.4 | 8.2 | 60 | 35.4 | 8.0 | 9.1 | 7.2 |
| Total | 178 (2) | 37.0 | 9.6 | 12.3 | 9.5 | 90 | 38.1 | 10.4 | 14.7 | 10.5 | 86 | 35.9 | 8.6 | 9.8 | 7.5 |

Number in the bracket indicates respondents who did not specify gender

# Implementation status of induction training

Organization of induction training at school level according to the Monitoring (2016)

| District Submitted the Monitoring Form | Number of Schools which Conducted CBC Induction Training | Number of Teachers who Missed the CBC Induction Training |
|---|---|---|
| 22 (73.3%) | 2,790 (88.4%) | 2,331 (4.8%) |

Organization of induction training at school level according to the HT Questionnaire

| | Fully | Partly | Not Organized |
|---|---|---|---|
| Total | 11 (55%) | 9 (45%) | 0 (0%) |

Teachers' attendance to induction trainings according to the teacher questionnaire

| | Fully attended | Partly attended | Not Attended |
|---|---|---|---|
| Total | 82 (47.4%) | 64 (37.0%) | 27 (15.6%) |



# Characteristics of teachers who didn't attend CBC induction training at school level

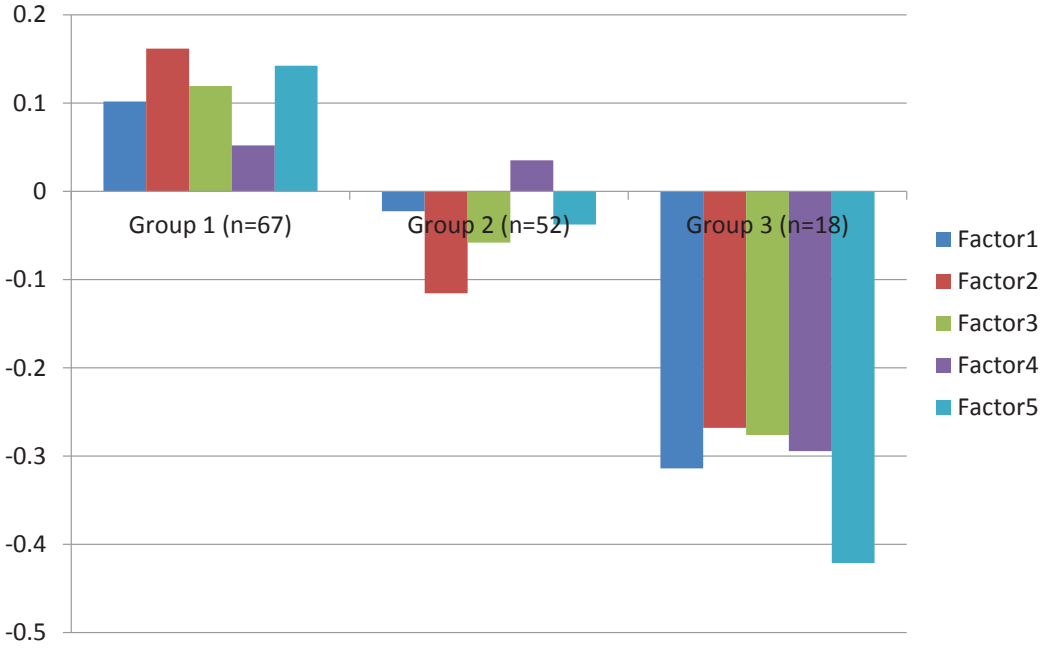
- There were a significant number of teachers who did not attend the CBC induction training at school level. **How can we encourage them to participate?**
- Exploratory Factor Analysis was conducted.
- Teachers were divided into 3 groups according to the status of participation in CBC induction training at their schools to compare responses to questions related to Continuous Professional Development.
  - Group 1: Fully attended
  - Group 2: Partly attended
  - Group 3: not attended

# Results of Exploratory Factor Analysis

| | | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Communality |
|---|---|---|---|---|---|---|---|
| Shared school vision | There are clear aims or objectives in my school. | **.923** | -.062 | -.126 | .071 | -.030 | .747 |
| | There is cooperative system among different subjects in my school. | **.722** | -.112 | .185 | -.174 | .358 | .710 |
| | The vision/mission of my school is shared within school community members. | **.667** | .085 | .111 | .025 | -.097 | .608 |
| | The vision/mission of my school is/are clearly stated. | **.623** | .241 | .003 | .000 | -.125 | .576 |
| Participatory school management | My head teacher is supportive in improving teaching and learning in my school. | -.043 | **.980** | .023 | .061 | -.179 | .873 |
| | The school leaders encourage us to give some comments/ ideas to contribute school improvement. | .232 | **.545** | -.038 | -.041 | .120 | .521 |
| | My opinions often contribute to the process of making decision in my school. | -.024 | **.511** | .234 | .016 | .139 | .523 |
| | My students' parents/guardians contact me from their side to talk about students' performance. | .023 | **.423** | .053 | -.040 | .269 | .373 |
| Collegiality for lesson improvement | I often give advice/consultation to my colleagues to improve their teaching. | -.012 | .065 | **.851** | -.076 | .178 | .843 |
| | I often receive advice/consultation from my colleagues to improve my teaching. | -.134 | .044 | **.743** | .075 | .172 | .613 |
| | I am willing to share my good lesson practice with my colleagues. | .135 | .083 | **.648** | -.079 | -.058 | .549 |
| | I use the feedback/advice given by my colleague to improve my teaching and learning process. | .062 | -.094 | **.595** | .215 | .085 | .502 |
| Evidence-based school planning | School activities are proceeded as planned in my school. | -.225 | .004 | .149 | **.815** | .042 | .583 |
| | I usually contact to my students' parents/guardians from my side to talk about students' performance. | -.018 | .015 | -.238 | **.616** | .446 | .624 |
| | The objectives and plans are achieved successfully in my school. | .153 | -.023 | .086 | **.531** | -.077 | .412 |
| | Results from national examination are analyzed by all teachers together. | .232 | .102 | -.201 | **.507** | .164 | .513 |
| | I make my effort to attain the vision/mission of my school. | .290 | -.104 | .296 | **.463** | -.353 | .597 |
| | Objectives and plans are developed based on evidence and data in my school. | .308 | .055 | .001 | **.404** | .117 | .503 |
| Resource persons | School-based Mentor (SBM) in my school helps me improve my lesson. | -.018 | -.016 | .101 | .054 | **.574** | .371 |
| | School Subject Leader (SSL) in my school helps me improve my lesson. | -.077 | -.019 | .280 | .053 | **.553** | .425 |



# Factor score by participation



# Findings and Discussion

- Monitoring survey
  - Most of the schools surveyed seemed to have implemented the CBC induction training. In other words, CBC training framework can be considered effective in reaching teachers at school level.
  - However, a significant number of teachers did not fully participate in CBC induction training.



# Findings and Discussion

- Field survey
  - Exploratory Factor Analysis extracted 5 factors which can explain the motivation to participate in CBC induction training.
  - The factor scores of Group 1 (fully attended) were all positive, whilst those of the Group 2 (partly attended) were neutral and those of Group 3 (not attended) were negative.
  - This suggests the importance of supporting environment which encourages teachers' participation in school-based professional development activities, such as good school management, collaborative colleagues and effective resource persons. These aspects may be reducing the difficulties around cascade training in reaching all target teachers. Therefore, these should be emphasized in considering future training framework.

# Challenges

- The quality of training has not been investigated though it may have affected the degree of participation.

- This should be researched for establishing a better teacher training framework in Rwanda.



**THANK YOU FOR YOUR ATTENTION**

# Organization of the field study

| | Team A | | Team B |
|---|---|---|---|
| AM | **School A** | | **School B** |
| | Lesson Observation/Video Shooting<br>HT Interview/Questionnaire survey<br>Teacher Interview/Questionnaire survey<br>Student Interview/Questionnaire survey | | Lesson Observation/Video Shooting<br>HT Interview/Questionnaire survey<br>Teacher Interview/Questionnaire survey<br>Student Interview/Questionnaire survey |
| PM | **School C (Primary School*)** | | **District Office** |
| | Lesson Observation/Video Shooting<br>HT Interview/Questionnaire survey<br>Teacher Interview/Questionnaire survey<br>Student Interview/Questionnaire survey | | Interview about DCC and SBI/CPD |



# Challenges in conducting CBC induction training at school level

Challenges in conducting CBC induction training at school level according to HT Questionnaire

| Category | # of HTs | Examples of comments |
|---|---|---|
| Material | 8 | Lack of teaching materials (e.g. training materials, computers, etc) |
| Textbook | 6 | Textbooks for some subjects have not been distributed |
| Time | 5 | No time for trainings. Training conducted during the school term disturbed lessons |
| Motivation/mind-set | 3 | fear of change |
| Refresher | 3 | School Subject Leaders need to be trained regularly |
| Trainer | 3 | Lack of School Subject Leaders (in primary) |
| Allowance | 2 | Lack of financial autonomy |
| Syllabus | 2 | |
| Involvement | 2 | Difficult to involve all teachers |
| Practical knowledge and experience | 1 | Lack of good lesson plans, ideas for good teaching and learning activities |

# Appendix 23. DETA 2017
# Presentation Material

# Exploratory analysis on motivational factors influencing teachers' participation to School-Based In-service teacher training (SBI) program in Rwanda

Claudien NZITABAKUZE[1], Antoine MTSINZI[1], Ruth MUKAKIMENYI[1],
Ryuichi SUGIYAMA[2], Kyoko YOSHIKAWA[2], Sayaka MATSUZUKI[2] & Yumiko ONO[3]

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[3] Naruto University of Education, Japan

# Background

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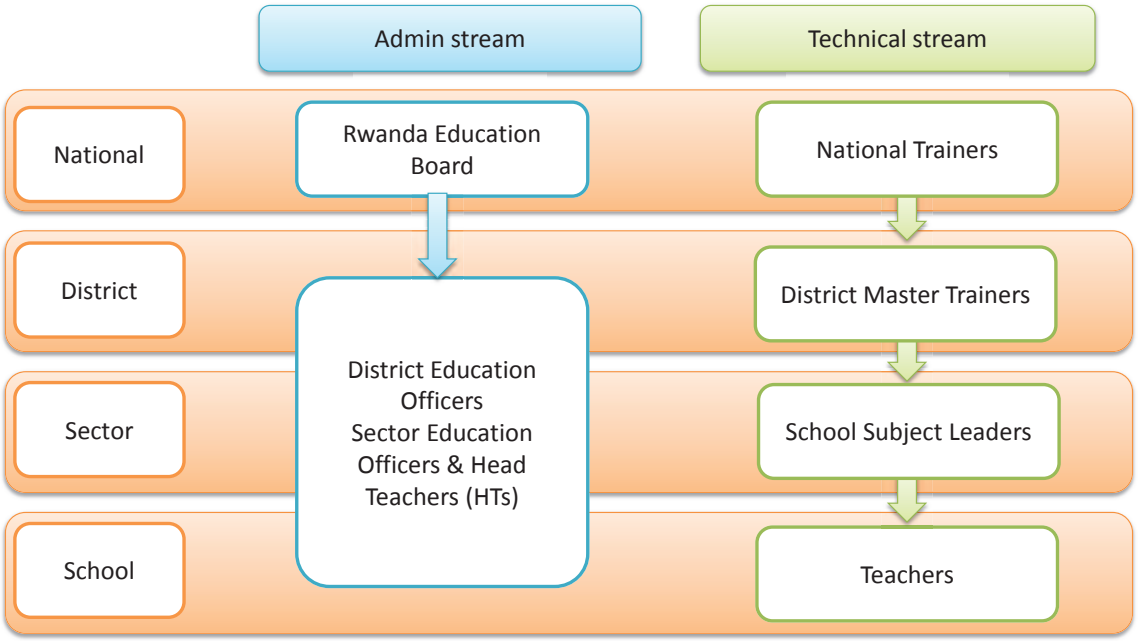




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| TOTAL | 20 | 20 | 178 | 985 | 20 | 139 | 530 | 20 |



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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
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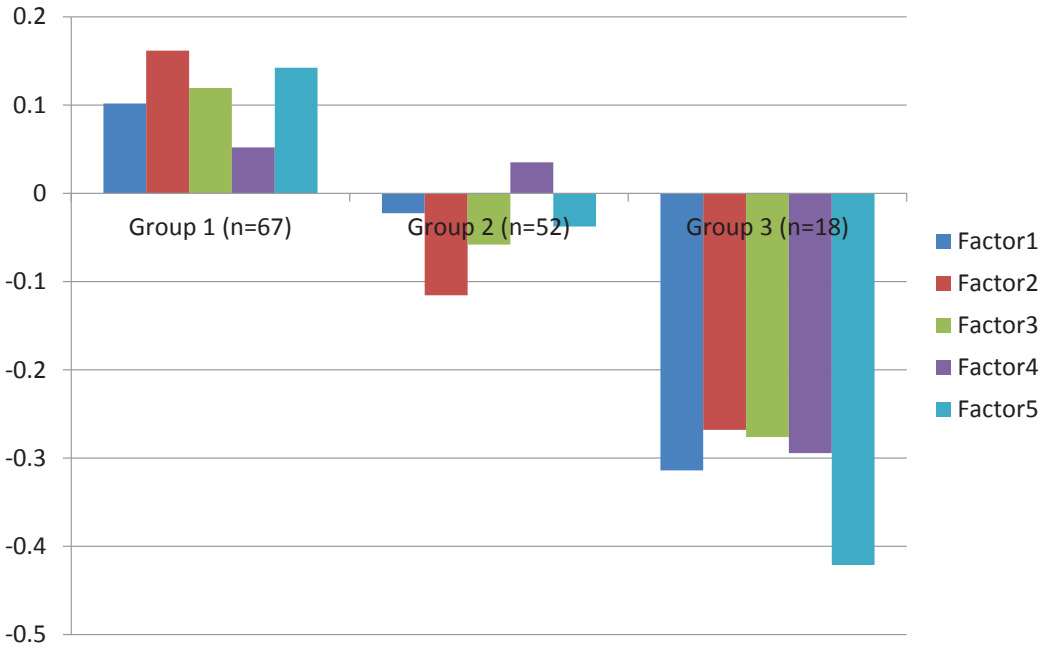
| | My opinions often contribute to the process of making decision in my school. | -.024 | **.511** | .234 | .016 | .139 | .523 |
| | My students' parents/guardians contact me from their side to talk about students' performance. | .023 | **.423** | .053 | -.040 | .269 | .373 |
| Collegiality for lesson improvement | I often give advice/consultation to my colleagues to improve their teaching. | -.012 | .065 | **.851** | -.076 | .178 | .843 |
| | I often receive advice/consultation from my colleagues to improve my teaching. | -.134 | .044 | **.743** | .075 | .172 | .613 |
| | I am willing to share my good lesson practice with my colleagues. | .135 | .083 | **.648** | -.079 | -.058 | .549 |
| | I use the feedback/advice given by my colleague to improve my teaching and learning process. | .062 | -.094 | **.595** | .215 | .085 | .502 |
| Evidence-based school planning | School activities are proceeded as planned in my school. | -.225 | .004 | .149 | **.815** | .042 | .583 |
| | I usually contact to my students' parents/guardians from my side to talk about students' performance. | -.018 | .015 | -.238 | **.616** | .446 | .624 |
| | The objectives and plans are achieved successfully in my school. | .153 | -.023 | .086 | **.531** | -.077 | .412 |
| | Results from national examination are analyzed by all teachers together. | .232 | .102 | -.201 | **.507** | .164 | .513 |
| | I make my effort to attain the vision/mission of my school. | .290 | -.104 | .296 | **.463** | -.353 | .597 |
| | Objectives and plans are developed based on evidence and data in my school. | .308 | .055 | .001 | **.404** | .117 | .503 |
| Resource persons | School-based Mentor (SBM) in my school helps me improve my lesson. | -.018 | -.016 | .101 | .054 | **.574** | .371 |
| | School Subject Leader (SSL) in my school helps me improve my lesson. | -.077 | -.019 | .280 | .053 | **.553** | .425 |

# Factor score by participation



# Findings and Discussion

- Monitoring survey
  - Most of the schools surveyed seemed to have implemented the CBC induction training. In other words, CBC training framework can be considered effective in reaching teachers at school level.
  - However, a significant number of teachers did not fully participate in CBC induction training.
- Field survey
  - Exploratory Factor Analysis extracted 5 factors which can explain the motivation to participate in CBC induction training.
  - The factor scores of Group 1 (fully attended) were all positive, whilst those of the Group 2 (partly attended) were neutral and those of Group 3 (not attended) were negative.
  - This suggests the importance of supporting environment which encourages teachers' participation in school-based professional development activities, such as good school management, collaborative colleagues and effective resource persons. These aspects may be reducing the difficulties around cascade training in reaching all target teachers. Therefore, these should be emphasized in considering future training framework.

# Appendix 24. WALS 2017
# Presentation Material

# World Association of lesson study 2017 in Nagoya November 26th , 2017

## Implementation of Competence-based Curriculum (CBC) in Rwanda: The Case of Mathematics

Antoine Mutsinzi[a,] YAMASHITA Kana[b] ABE Tateo[c]
ONO Yumiko[d] SUGIYAMA Ryuichi[e] MATSUZUKI Sayaka[e]

[A] Rwanda Education Board [b]Naruto University of Education (M2) [c]Tohoku Bunkyo College
[d]Waseda University Institute of Teacher Education [e]PADECO Co., Ltd.）

# Background

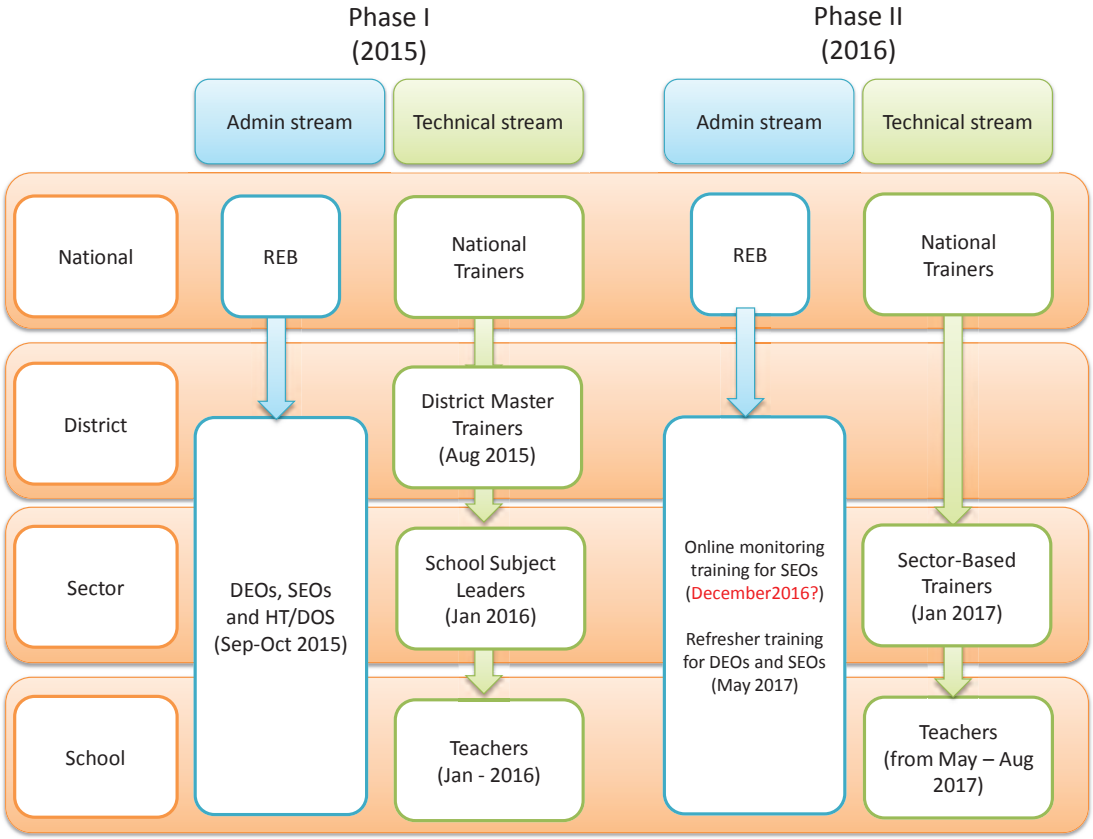
- Since 2016 a new competence-based curriculum (CBC) has been introduced in primary and secondary schools in Rwanda
- This reform is a significant shift from objective and knowledge-based learning because CBC emphasizes no longer on passive acquisition of knowledge, but on the development of skills and attitudes required to ensure the learner is competent in the application of knowledge
- Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS Project) launched in Jan 2017 to strengthen support implementation of CBC curriculum in classrooms

# Structure of training conducted to support Teacher to implement CBC

**2015**
- Phase 1 training

**2016**
- Phase 2 training started
- Completed July 2017

**2017**
- September/October
- Phase 3 training




- The first and second phase of CBC training took different cascading structures.
- The figure shows the training structure and implementation schedule for the first and second phases of the CBC training.

# Research Objectives

- To explore how Rwandan change the mind in terms of the understanding their role in school management, the role of resource person to support each other to improve the lesson, after introduction of CBC and the first phase of induction training.
- To understand how teachers transmit knowledge and skills learned from the training to improve classroom practice by critically analyze mathematics lessons before and after intervention from SIIQS project

**Research Questions**

1. How do teacher change their mind set after the first phase of training?
2. How has the lesson changed after the project supported lesson study?



# Methodology for Research Question 1: Change of Teachers' Mindset

I. Monitoring survey (Census)

- Conducted in July 2016
- Monitoring form to all District Education Officers (30)

  ⇨ Number of school: 3,156
  Number of teachers: 48,562

II. Field Survey (Sampling survey)

- Conducted in March 2017

1. Questionnaire: HTs, teachers and students
2. Focus group interview: HTs, teachers and students
3. Lesson observation: Math and Science

| Sample size | No. of schools | 1. Questionnaire | | | 2. Focus Group Interview | | | 3. Lesson Observation |
|---|---|---|---|---|---|---|---|---|
| | | HT | Teacher | Student | HT | Teacher | Student | |
| TOTAL | 20 | 20 | 178 | 985 | 20 | 139 | 530 | 20 |

# **Quantitative data**: Implementation status of induction training

Organization of induction training at school level according to the Monitoring (2016)

| District Submitted the Monitoring Form | Number of Schools which Conducted CBC Induction Training | Number of Teachers who Missed the CBC Induction Training |
|---|---|---|
| 22 (73.3%) | 2,790/3,160 ~ (88.4%) | 2,331/48,562 (4.8%) |

Organization of induction training at school level according to the HT Questionnaire

| | Fully | Partly | Not Organized |
|---|---|---|---|
| Total | 11 (55%) | 9 (45%) | 0 (0%) |

Teachers' attendance to induction trainings according to the teacher questionnaire

| | Fully attended | Partly attended | Not Attended |
|---|---|---|---|
| Total | 82 (47.4%) | 64 (37.0%) | 27 (15.6%) |

# Characteristics of teachers who didn't attend CBC induction training at school level

- There were a significant number of teachers who did not attend the CBC induction training at school level.

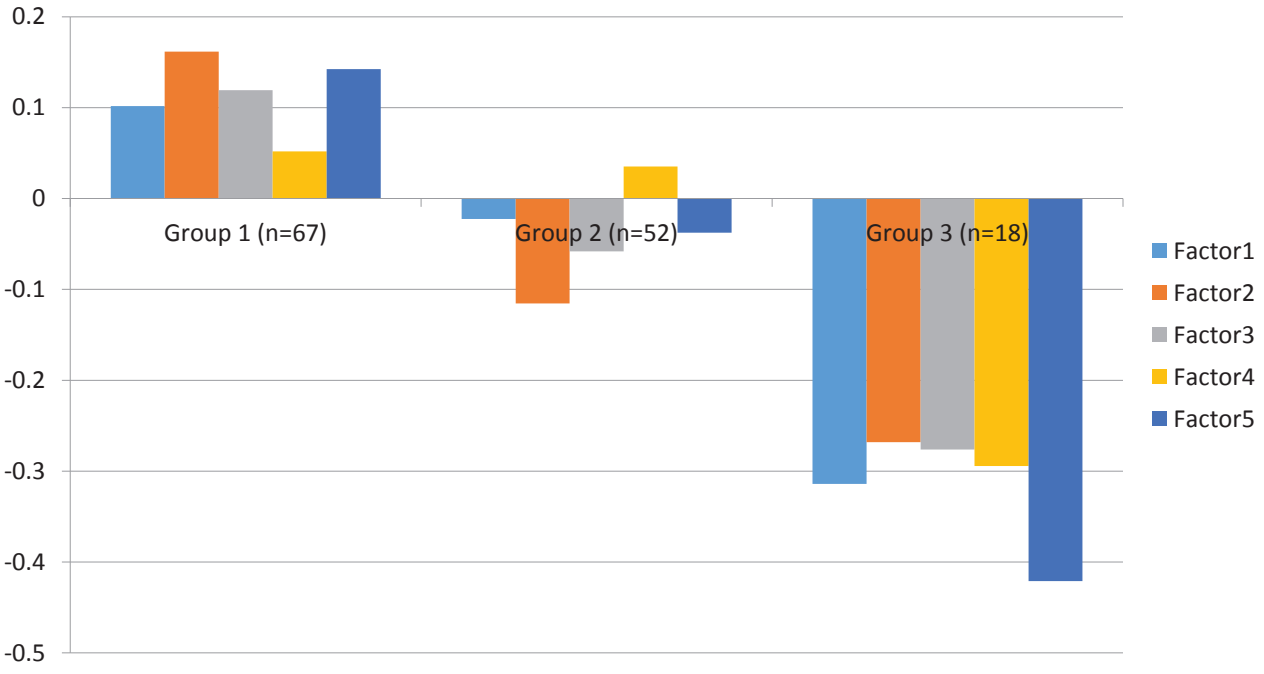
  ***How can we encourage them to participate?***

- Exploratory Factor Analysis was conducted.
- Teachers were divided into 3 groups according to the status of participation in CBC induction training at their schools to compare responses to questions related to Continuous Professional Development.
  - Group 1: Fully attended
  - Group 2: Partly attended
  - Group 3: not attended

# Results of Exploratory Factor Analysis

| | | Factor1 | Factor2 | Factor3 | Factor4 | Factor5 | Communality |
|---|---|---|---|---|---|---|---|
| Shared school vision | There are clear aims or objectives in my school. | **.923** | -.062 | -.126 | .071 | -.030 | .747 |
| | There is cooperative system among different subjects in my school. | **.722** | -.112 | .185 | -.174 | .358 | .710 |
| | The vision/mission of my school is shared within school community members. | **.667** | .085 | .111 | .025 | -.097 | .608 |
| | The vision/mission of my school is/are clearly stated. | **.623** | .241 | .003 | .000 | -.125 | .576 |
| Participatory school management | My head teacher is supportive in improving teaching and learning in my school. | -.043 | **.980** | .023 | .061 | -.179 | .873 |
| | The school leaders encourage us to give some comments/ ideas to contribute school improvement. | .232 | **.545** | -.038 | -.041 | .120 | .521 |
| | My opinions often contribute to the process of making decision in my school. | -.024 | **.511** | .234 | .016 | .139 | .523 |
| | My students' parents/guardians contact me from their side to talk about students' performance. | .023 | **.423** | .053 | -.040 | .269 | .373 |
| Collegiality for lesson improvement | I often give advice/consultation to my colleagues to improve their teaching. | -.012 | .065 | **.851** | -.076 | .178 | .843 |
| | I often receive advice/consultation from my colleagues to improve my teaching. | -.134 | .044 | **.743** | .075 | .172 | .613 |
| | I am willing to share my good lesson practice with my colleagues. | .135 | .083 | **.648** | -.079 | -.058 | .549 |
| | I use the feedback/advice given by my colleague to improve my teaching and learning process. | .062 | -.094 | **.595** | .215 | .085 | .502 |
| Evidence-based school planning | School activities are proceeded as planned in my school. | -.225 | .004 | .149 | **.815** | .042 | .583 |
| | I usually contact to my students' parents/guardians from my side to talk about students' performance. | -.018 | .015 | -.238 | **.616** | .446 | .624 |
| | The objectives and plans are achieved successfully in my school. | .153 | -.023 | .086 | **.531** | -.077 | .412 |
| | Results from national examination are analyzed by all teachers together. | .232 | .102 | -.201 | **.507** | .164 | .513 |
| | I make my effort to attain the vision/mission of my school. | .290 | -.104 | .296 | **.463** | -.353 | .597 |
| | Objectives and plans are developed based on evidence and data in my school. | .308 | .055 | .001 | **.404** | .117 | .503 |
| Resource persons | School-based Mentor (SBM) in my school helps me improve my lesson. | -.018 | -.016 | .101 | .054 | **.574** | .371 |
| | School Subject Leader (SSL) in my school helps me improve my lesson. | -.077 | -.019 | .280 | .053 | **.553** | .425 |

# Factor score by participation



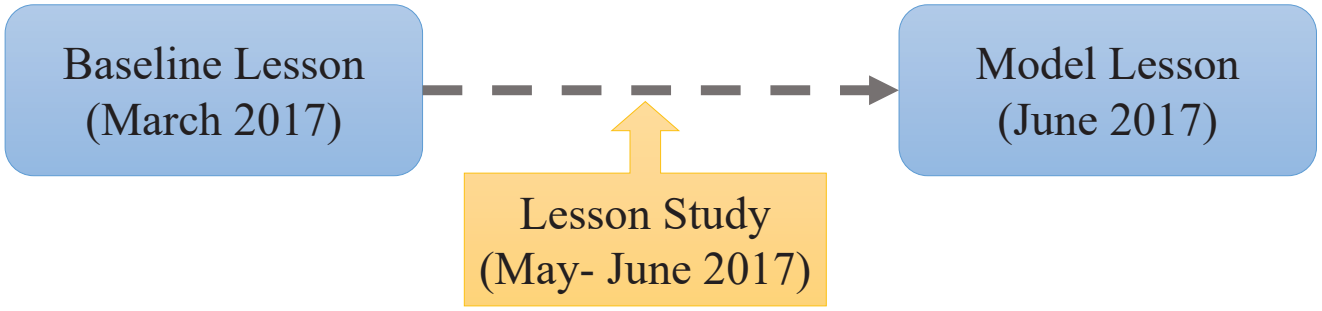
# Methodology for Research Question 2: Change of Lessons

I. Qualitative analysis

Comparison of actual lessons with lesson plans, ongoing curriculum (CBC)

II. Quantitative analysis

Discourse analysis and teachers' questions analysis






# Target schools

- Outline of Baseline Survey

Survey Period: March 14, 2017- March 17, 2017 (4 days)

Place: 5 primary and secondary in northern and western provinces

| School | Primary A | Primary B | Primary C | Primary D | Secondary E |
|---|---|---|---|---|---|
| School category | P1-6 | P1-6 | P1-6 | P1-6 | P1-S3 |
| Grade | P4 | P4 | P5 | P5 | S2 |
| Unit | Positive and negative integers | Mathematical operation on the whole number | Addition of positive and negative integers | Equivalent fractions and operations | Polynomials functions |
| Topic | Meaning of positive and negative integers | Division of 2 digit number without remainder | Ordering integers | Comparing fractions | Quadratic equation |
| Teacher | Female | Female, middle aged | Female | Male, middle aged | Male |

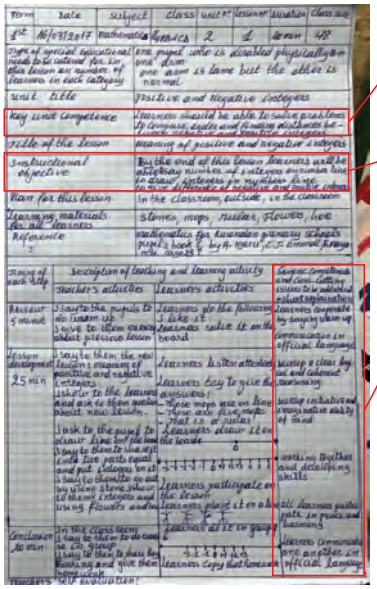
# Summary of baseline survey analysis

- Yamashita et al. (2017) transcribed five mathematics lessons from baseline survey for a quantitative and a qualitative discourse analysis
  - Teachers make lesson plan according to CBC
  - In actual lessons, “Closed questions” is predominant and teacher centered
  - There were few learning activities and questions for nurturing mathematical thinking or attitudes

Result (1)

# Qualitative Analysis of Baseline Survey

- Teachers write lesson plan according to CBC (Yamashita et al.,2017)



**Key Unit Competence:**
Learners should be able to solve problems to compare, order and finding distances between negative and positive integers

**Instructional Objectives:**
By the end of this lesson learners will be able to say number of integers on number line to draw integers on number line to give distance of negative and positive integers

**Generic Competences and Cross-cutting Issues to be addressed + short explanation:**
-Learners cooperate by saying warm up.
-Communication in official language.
-Develop a clear logical and coherent reasoning.
-Develop initiative and imaginative ability of mind.
-Working together and developing skills.
-All learners participate in peace and harmony.

Result (1)

# Quantitative Analysis of Baseline Survey

Teachers' utterance by code (Yamashita et al.,2017)

| Code | A (%) | B (%) | C (%) | D (%) | E (%) |
|---|---|---|---|---|---|
| Closed Question | 94 (41.6) | 40 (26.0) | 92 (43.4) | 39 (28.3) | 171 (47.0) |
| Open Question | 3 (1.3) | 2 (1.3) | 0 (0.0) | 1 (0.7) | 2 (0.6) |
| Instruction | 25 (11.1) | 32 (20.8) | 23 (10.8) | 14 (10.1) | 47 (12.9) |
| Confirmation | 0 (0.0) | 15 (9.7) | 22 (10.4) | 29 (21.0) | 22 (6.0) |
| Explanation | 27 (12.0) | 8 (5.2) | 7 (3.3) | 13 (9.4) | 43 (11.8) |
| Ask Agreement | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Point student | 35 (15.5) | 16 (10.4) | 33 (15.6) | 14 (10.1) | 1 (0.3) |
| Encouragement | 9 (4.0) | 15 (9.7) | 12 (5.7) | 12 (8.7) | 10 (2.8) |
| Justification | 20 (8.9) | 8 (5.2) | 19 (9.0) | 15 (10.9) | 48 (13.2) |
| Others | 4 (1.8) | 12 (7.8) | 4 (1.9) | 0 (0.0) | 14 (3.9) |
| Clap | 0 (0.0) | 6 (3.9) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Impossible to listen | 9 (4.0) | 0 (0.0) | 0 (0.0) | 1 (0.7) | 6 (1.7) |
| **Total** | **226** | **154** | **212** | **138** | **364** |

- In Zambia's case study, "Instruction" (25.26%) and "Closed Question" (23.52%) are Predominant (Nakawa 2011)

Result (1)

# Quantitative Analysis of Baseline Survey

Teachers' questions by category (Yamashita et al.,2017)

| Category | A (%) | B (%) | C (%) | D (%) | E (%) |
|---|---|---|---|---|---|
| Presentation of task | 97 (100.0) | 42 (100.0) | 84 (91.3) | 39 (97.5) | 173 (100.0) |
| Asking knowledge and skills | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Asking how students thinking | 0 (0.0) | 0 (0.0) | 4 (4.3) | 0 (0.0) | 0 (0.0) |
| Asking attitude | 0 (0.0) | 0 (0.0) | 4 (4.3) | 1 (2.5) | 0 (0.0) |
| **Total** | **97** | **42** | **92** | **40** | **173** |

- Teachers try to change their lessons interactive and creative
- In real lessons teachers' utterances are predominant and there were few considered essential for nurturing mathematical thinking or attitudes

# Outline of Lesson Study Intervention

- Lesson study at primary C

| Date and time | Stage | Contents |
|---|---|---|
| May 30, 2017 (Tue.) 9:00-11:20 | **Stage 1** | **Orientation**<br>(Explanation on lesson study, Problem identification) |
| Jun 6, 2017 (Tue.) 9:00-11:00 | **Stage 2** | **Lesson Planning**<br>(Developing lesson plan by a team of math teachers themselves) |
| | **Stage 3** | **Micro-teaching**<br>(Developing lesson plan with project members) |
| Jun 13, 2017 (Tue.) 9:00-11:15 | | **Micro-teaching**<br>(Lesson practice, Feedback) |
| Jun 20, 2017 (Tue.) 9:00-11:00 | **Stage 4** | **Model lesson development**<br>(Lesson practice in the class room, Feedback) |
| Jun 27, 2017 (Tue.) 8:05-12:30 | | **Model lesson development**<br>(Video shooting, Over all comments) |

（Source：PADECO Co., Ltd ）

# Before lesson study: Baseline Lesson (Primary C)【Lesson C】

| | |
|---|---|
| Grade & Subject | P5 Mathematics |
| Title of the lesson | Ordering integers |
| Lesson objective | Using number line, learners will be able to order integers in ascending and descending order in a given time |
| Lesson form | Group work, Question and answer |
| Step | Ask integers<br>Ordering integers on number line (Group work)<br>Ordering temperatures on number line (Group work) |

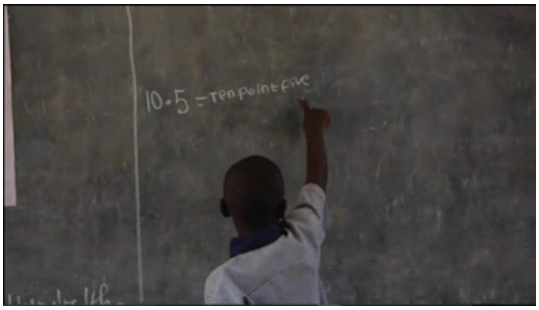
## After introduction of LS: Model Lesson (Primary C)【Lesson C'】

| | |
|---|---|
| Grade & Subject | P4 Mathematics |
| Title of the lesson | Reading and Writing decimal numbers |
| Lesson objective | To read and to write decimal number correctly |
| Lesson form | Group work, Question and answer,<br>Number line and place value table on manila paper |
| Step | Reading and writing of integers<br>Filling out fraction numbers on number line<br>Explanation on how to read and write decimal number with use of place value table<br>Practice of reading and writing decimal numbers (Individual work → Group work) |

Result (2)

# Qualitative Analysis of Model Lesson

- Teacher teach learning contents with good explanations
- Students' utterances were increased, for example, students read numbers in front of black board or all the class members practice pronunciation of numbers




➢Learning activities in model lesson are helpful to achieve lesson objectives and competency written in the lesson plan

## Result (2)
## Quantitative Analysis of Model Lesson

Teachers' utterance by code

| Code | Model lesson C' (%) | Baseline lesson C (%) |
|---|---|---|
| Closed Question | 123 (25.7) | 92 (43.4) |
| Open Question | 0 (0.0) | 0 (0.0) |
| Instruction | 109 (22.8) | 23 (10.8) |
| Confirmation | 51 (10.7) | 22 (10.4) |
| **Explanation** | **90 (18.8)** | **7 (3.3)** |
| Ask Agreement | 0 (0.0) | 0 (0.0) |
| Point student | 38 (7.9) | 33 (15.6) |
| Encouragement | 23 (4.8) | 12 (5.7) |
| Justification | 32 (6.7) | 19 (9.0) |
| Others | 12 (2.5) | 4 (1.9) |
| Clap | 0 (0.0) | 0 (0.0) |
| Impossible to listen | 0 (0.0) | 0 (0.0) |
| **Total** | **478** | **212** |

Students' utterance by code

| Code | Model lesson C' (%) | Baseline lesson C (%) |
|---|---|---|
| Yes/No answer to teacher | 47 (24.7) | 30 (20.3) |
| Yes/No answer to student | 0 (0.0) | 0 (0.0) |
| One term answer to teacher | 12 (6.3) | 53 (35.8) |
| One term answer to student | 0 (0.0) | 0 (0.0) |
| Question to teacher | 1 (0.5) | 0 (0.0) |
| Question to student | 0 (0.0) | 0 (0.0) |
| Opinion to teacher | 0 (0.0) | 0 (0.0) |
| Opinion to student | 0 (0.0) | 0 (0.0) |
| Incomplete answer | 0 (0.0) | 0 (0.0) |
| **Repeating or just reading** | **79 (41.6)** | **12 (8.1)** |
| Silent to teacher | 0 (0.0) | 4 (2.7) |
| Silent to student | 0 (0.0) | 0 (0.0) |
| Point student | 0 (0.0) | 0 (0.0) |
| Clap | 0 (0.0) | 3 (2.0) |
| Writing or gesture to teacher | 0 (0.0) | 14 (9.5) |
| Writing or gesture to student | 0 (0.0) | 0 (0.0) |
| Impossible to listen | 0 (0.0) | 3 (2.0) |
| Others | 51 (26.8) | 29 (19.6) |
| **Total** | **190** | **148** |

## Result (2)
# Quantitative Analysis of Model Lesson

Teachers' questions by category

| Category | Model lesson C'(%) | Baseline lesson C (%) |
|---|---|---|
| Presentation of task | 122 (99.2) | 84 (91.3) |
| Asking knowledge and skills | 1 (0.8) | 0 (0.0) |
| Asking how students thinking | 0 (0.0) | 4 (4.3) |
| Asking attitude | 0 (0.0) | 4 (4.3) |
| **Total** | **123** | **92** |

- The type and quality of teachers' questions are not changed, but increase of students' utterance indicates students use more time to think in their minds
- **The Teacher has a clear point in her explanations**

# Conclusion

- Lesson study input by SIIQS Project may help change lessons to CBC lessons little by little
- Conducting just one cycle of lesson study cannot change quality of questions from a teacher
- Without improving quality of teacher questions, the nexus of teaching and learning, difficult to build competency among learners
- SIIQS Project must support creating and institutionalizing a mechanism to sustain lesson study at school level

# Further research is needed

1) How will lessons be changed through continuous lesson study

2) Relations between change of lessons and change of teachers' view/perception of lessons

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# Appendix 25. WALS 2018
# Presentation Material

# Improvement of Teachers' Questioning Skills in Mathematics and Students' Higher Order Thinking Skills through Lesson Study in Rwanda

## WALS 2018

Kenji Ohara[1], Ryuichi Sugiyama[1], Sayaka Matsuzuki[1], Yumiko Ono[2], Tateo Abe[3],
PADECO Co., Ltd., Japan,
Waseda University, Japan,
Tohoku Bukyo University, Japan



# Outline of the Presentation

1. Background of this study
2. Outline of Lesson Study
3. Analysis of the Assessment Questions
   - ✓Categorization of assessment questions
   - ✓Result of categorization and findings
4. 2018 Lesson Study
   - ✓Objectives
   - ✓Discourse Analysis
   - ✓Pre and Post Test
5. Result of Pre and Post Test
6. Conclusion

# Background

- Since 2016 a new competence-based curriculum (CBC) has been introduced in primary and secondary schools in Rwanda
- This reform is a significant shift from objective and knowledge-based learning because CBC emphasizes no longer on passive acquisition of knowledge, but on the development of skills and attitudes required to ensure the learner is competent in the application of knowledge
- JICA Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS Project) launched in Jan 2017 to strengthen implementation of CBC curriculum in classrooms
- The Project Team develop model lessons that show concrete examples of CBC by using Lesson Study so that teachers can refer, imitate and improve by themselves from 2017 with five model schools



# Research Questions

- To explore;
  - ➢how Rwandan teachers understand level of questions (Bloom's Taxonomy)
  - ➢how much skills teachers have to set suitable level of questions
  - ➢how teachers improve questioning skills through Lesson Study
  - ➢how students improve their higher order thinking level through lessons

# Outline of Lesson Study

**2017**

- Select 5 model schools and formulate the Lesson Study Group for mathematics and science lessons
- Introduce and implement Lesson Study
- Develop model lesson for CBC implementation

**2018**

- Select 4 model schools and set objectives for Lesson Study
- Implement and evaluate Lesson Study in mathematics

| Stage | Contents |
|---|---|
| **Stage 1** | **Orientation**<br>(Explanation on lesson study, Problem identification) |
| **Stage 2** | **Lesson Planning**<br>(Developing lesson plan by a team of math teachers themselves) |
| **Stage 3** | **Micro-teaching**<br>(Developing lesson plan with project members) |
| | **Micro-teaching**<br>(Lesson practice, Feedback) |
| **Stage 4** | **Model lesson development**<br>(Lesson practice in the classroom, Feedback) |
| | **Model lesson development**<br>(Video shooting, Overall comments) |



# Categorization of Assessment Questions

- Sector Based Trainers (SBTs) set questions for assessment of each topic in each grade in mathematics from lower level to higher level equally based on Bloom's Taxonomy.
- Developed questions were not equally developed in each level as SBTs thought.

P4

| Difficulty | Level 1 (Knowledge) | Level 2 (Comprehension) | Level 3 (Application) | Level 4 (Analysis) | Level 5 (Synthesis) | Level 6 (Evaluation) |
|---|---|---|---|---|---|---|
| Advanced | 0 | 1 | 0 | 0 | 0 | 0 |
| Intermediate | 9 | 4 | 0 | 0 | 0 | 0 |
| Basic | 15 | 10 | 2 | 1 | 0 | 0 |
| Total | 24 | 15 | 2 | 1 | 0 | 0 |

P5

| Difficulty | Level 1 (Knowledge) | Level 2 (Comprehension) | Level 3 (Application) | Level 4 (Analysis) | Level 5 (Synthesis) | Level 6 (Evaluation) |
|---|---|---|---|---|---|---|
| Advanced | 0 | 0 | 2 | 0 | 0 | 0 |
| Intermediate | 5 | 5 | 6 | 1 | 0 | 0 |
| Basic | 5 | 11 | 11 | 1 | 0 | 0 |
| Total | 10 | 5 | 17 | 2 | 0 | 0 |

P6

| Difficulty | Level 1 (Knowledge) | Level 2 (Comprehension) | Level 3 (Application) | Level 4 (Analysis) | Level 5 (Synthesis) | Level 6 (Evaluation) |
|---|---|---|---|---|---|---|
| Advanced | 0 | 0 | 0 | 1 | 0 | 0 |
| Intermediate | 2 | 4 | 13 | 0 | 0 | 0 |
| Basic | 4 | 10 | 28 | 0 | 0 | 0 |
| Total | 6 | 14 | 41 | 1 | 0 | 0 |

Total (%)

| Level 1 (Knowledge) | Level 2 (Comprehension) | Level 3 (Application) | Level 4 (Analysis) | Level 5 (Synthesis) | Level 6 (Evaluation) |
|---|---|---|---|---|---|
| 29.0 | 24.6 | 43.5 | 2.9 | 0.0 | 0.0 |

# Findings from Categorization of Assessment Questions

- About 97% of questions lower than application level
- Most questions categorized Knowledge Level in Grade 4, and Application Level in Grade 5 and 6
- SBTs may have difficulty in setting Higher Order Thinking level of questions
- Teachers also have same challenges
- To improve teachers questioning skills is essential to improve students Higher Order Thinking Skills



# Lesson Study (2018)

- Objective: To improve teachers' questioning skills in order to develop and use suitable questions (level) for mathematics lesson

- Two primary school selected to collect data and analyze improvement of questioning skills

| | |
|---|---|
| School A | It is located about 45 km from Kigali. It has 14 classes and 11 teachers. It was selected as the backdrop for the pilot school-based CPD and regular monitoring because it is average and typical in achievement and location (rural). |
| School B | A 12-year school comprised of primary and secondary level. It is located about 75 km from Kigali. It has 33 classes and 45 teachers. |

# Discourse analysis of a math Lesson (school A)

| Grade: | P6 | Number of students: | 43 | Duration | 40 min |
|---|---|---|---|---|---|
| Key Unit Competence: | To be able to work out simple interest and solve problems involving saving. | | | | |
| Title of the lesson: | Problems solving simple interest. | | | | |
| Instructional objective: | Using students will be able to solve simple interest confidently in groups and in required times (original) | | | | |
| Suggestion by the team | Teacher gives more oral questions to check students' prior knowledge and deepen their understanding before introducing a new activity. | | | | |
| Classroom Discourse: | Teacher (T): Yes you are ok! Then you are going to study mathematics, ok!<br>Student (S) Ss: Yes<br>T: What did we learn yesterday? (Twice)<br>T: Fabrice!<br>S (Fabrice): Simple interest<br>T: Yesterday we have seen simple interest (Ls: Interest)<br>T: Gabriel! What have you studied yesterday?<br>S (Gabriel): Simple interest<br>T: We have studied simple interest<br>T: Everybody what did we learn yesterday?<br>Ss: Simple interest<br>T: We studied simple …<br>Ss: interest<br>T: Follow here<br>T: Who can read this question?<br>T: Who can try to read this question on chalk board?<br>S (Cynthia): (Read the question) Calculate simple interest given principle equal Four hundred thousand Frw, rate equal five percent and time equal one year.<br>T: The principle equal how many?<br>S: (Answer the question) Forty thousand, forty thousand, four hundred thousand.<br>T: (Answer the question and ask the student to repeat) Four hundred, four hundred, four hundred thousand. Repeat!<br>Ss: (Repeat the answer) Four hundred thousand.<br>T: Who can you go on the chalkboard and try to solve this question?<br>T: Who can try to find the simple interest there?<br>T: (Appoint one student)<br>S: Principle equal four hundred thousand.<br>T: Principle equal to how many?<br>S: (Answer the question) Four hundred thousand Frw.<br>T: (Repeat the answer) Principle equal to Four hundred thousand Frw<br>S: (Solve the question on the chalkboard) | | | | |



# Discourse analysis of a math Lesson (School B)

| Grade: | P6 | Number of students | 46 | Duration | 40 min |
|---|---|---|---|---|---|
| Key Unit Competence: | To be able to solve real life problem that involving finding time intervals and conversation units. | | | | |
| Title of the lesson: | Adding hours and minutes | | | | |
| Instructional objective: | Using the given different units of time and real-life situation, the peoples will be able to add units of time correctly | | | | |
| Suggestion by the team | Teacher use the clock effectively to have students deeper understanding of time interval practically. | | | | |
| Classroom Discourse: | Teacher (T): ahaah!! Let us start, look at this, all of you, have you seen?<br>Student (S): yes<br>T: what is this?<br>S: it is 11h:00'<br>T: I asked, "what is this" (showing a wall clock)<br>S: this is time<br>T: no any other?<br>S: it is a watch<br>T: loudly please!<br>S: it is a watch<br>T: what is this?<br>S': I didn't understand<br>T: repeat again<br>S: it is a watch<br>T: again<br>S: it is a watch<br>T: what is this?<br>S: it is a watch<br>T: you speak slowly, not loudly, loudly please! What is this?<br>S: it is a watch<br>T: it is a watch, what is the use of a watch? Who has a watch here? Give it to me, is this a watch?<br>S: yes, no<br>T: who says yes, put up your hands, this is a watch also and I asked you what is the use of watch.<br>S: to see time<br>(After these communications, to read the time the following the following interaction were organized between a T and L.)<br>T: the watch is used to see time; look at here what time is it? Abantu bose barareba? (Is everyone seeing?) What time is it?<br>S: it is 10 hours 11 minutes 6 seconds | T: what time is it?<br>S: it is 10 hours 55 minutes<br>T: correct?<br>S: no<br>T: others<br>S: 3 hours 55 minutes<br>T: others<br>S: 9 hours 55 minutes<br>T: let us discuss on this, what is the correct time?<br>S: correction, 9 hours 54 minutes.<br>T: what is the correct answer?<br>S: 9 hours 55 minutes.<br>T: let us continue, after 1 hour it will be which time?<br>S: 6 minutes.<br>T: after one hour? We are at 9 h 55 minutes.<br>S: 60 minutes.<br>T: nababajije nyuma y'isaha biraba ari ryari? Ninde uzi kuregera ngo aze atwereke nyuma y'isaha? (I asked what will be the time after one hour? Who does know to regulate so that he/she shows us after one hour?<br>S: 10 hours 0 minutes.<br>T: other?<br>S: 10 hours 55minutes.<br>T: watch to you to…, to tell time, which unit to use to tell time?<br>S: we use 2.<br>T: it is 2 but unit to tell time it is this time. It is ummm, we use unit which? Ingero, ni iki ukoresha kugirango ngo uvuge igihe? (Examples, what do you use to tell time?)<br>S: hours, seconds, minutes.<br>T: 1 hour equal how many minutes?<br>S: 60 minutes.<br>T: 1minute equal how many seconds?<br>S: 60 seconds. | | | |

# Qualitative Analysis of Teacher and Students' Utterances by code (School A)

Teacher

| Code | Baseline lesson March 2017(%) | Model lesson June 2017 (%) | Model lesson June 2018 |
|---|---|---|---|
| Closed Question | 92 (43.4) | 123 (25.7) | 19 (27.1) |
| Open Question | 0 (0.0) | 0 (0.0) | 0 |
| Instruction | 23 (10.8) | 109 (22.8) | 27 (38.6) |
| Confirmation | 22 (10.4) | 51 (10.7) | 5 (7.1) |
| **Explanation** | **7 (3.3)** | **90 (18.8)** | **3 (4.3)** |
| Ask Agreement | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Point student | 33 (15.6) | 38 (7.9) | 5 (7.1) |
| Encouragement | 12 (5.7) | 23 (4.8) | 5 (7.1) |
| Justification | 19 (9.0) | 32 (6.7) | 1 (1.4) |
| Others | 4 (1.9) | 12 (2.5) | 5 (7.1) |
| Clap | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Impossible to listen | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| **Total** | **212** | **478** | **70** |

Students

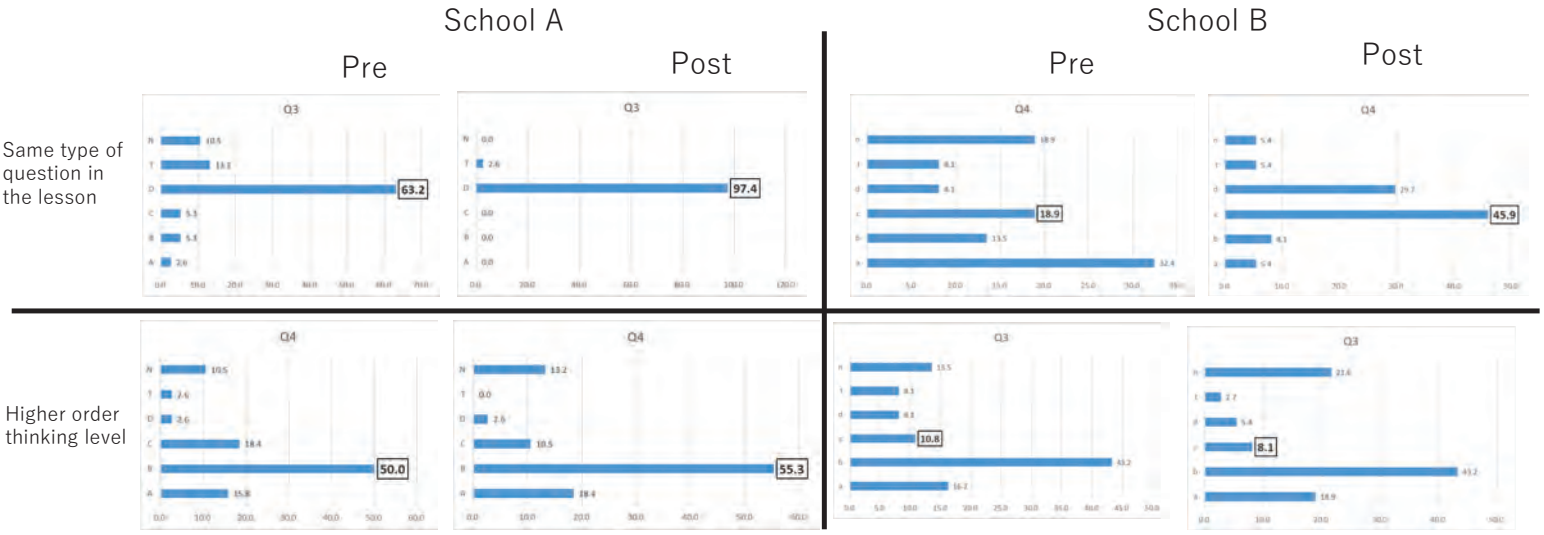
| Code | Baseline lesson March 2017(%) | Model lesson June 2017 (%) | Model lesson June 2018 (%) |
|---|---|---|---|
| Yes/No answer to teacher | 30 (20.3) | 47 (24.7) | 15 (37.5) |
| Yes/No answer to student | 0 (0.0) | 0 (0.0) | 0 |
| One term answer to teacher | 53 (35.8) | 12 (6.3) | 4 (10.0) |
| One term answer to student | 0 (0.0) | 0 (0.0) | 0 |
| Question to teacher | 0 (0.0) | 1 (0.5) | 0 |
| Question to student | 0 (0.0) | 0 (0.0) | 0 |
| Opinion to teacher | 0 (0.0) | 0 (0.0) | 0 |
| Opinion to student | 0 (0.0) | 0 (0.0) | 0 |
| Incomplete answer | 0 (0.0) | 0 (0.0) | 0 |
| **Repeating or just reading** | **12 (8.1)** | **79 (41.6)** | **9 (22.5)** |
| Silent to teacher | 4 (2.7) | 0 (0.0) | 0 |
| Silent to student | 0 (0.0) | 0 (0.0) | 0 |
| Point student | 0 (0.0) | 0 (0.0) | 0 |
| Clap | 3 (2.0) | 0 (0.0) | 0 |
| Writing or gesture to teacher | 14 (9.5) | 0 (0.0) | 7 (17.5) |
| Writing or gesture to student | 0 (0.0) | 0 (0.0) | 0 |
| Impossible to listen | 3 (2.0) | 0 (0.0) | 0 |
| Others | 29 (19.6) | 51 (26.8) | 5 (12.5) |
| **Total** | **148** | **190** | **40** |



# Pre and Post-Test

- A quiz with four questions were developed to see how students improve their thinking skills through the lesson.
- Four questions consist of 2 questions to check necessary knowledges and skills for the lesson, 1 question to check understanding of the lesson and 1 question to check students higher order thinking level.
- In School A, the result of one question for checking necessary knowledges and skills for the lesson increased drastically from 63.2% to 97.4%. On the other hand, the result of one question for checking students' higher order thinking skill was not so remarkable and increased from 50.0% to 55.3%.
- In school B, the result of one question for checking understanding of basic contents of the lesson increased from 18.9% to 45.9%. On the other hand, the result of one question for checking students' higher order thinking skill decreased from 10.8% to 8.1%.

# Pre and Post-Test




- After the lesson, students' performance of the same type of question what they learnt in the lesson was drastically improved at both schools.
- On the other hand, there are no significant improvement on the higher order thinking level of question.



# Conclusion

- Teachers' questioning skills is not enough to set suitable levels of questions according to the students' understanding level.
- Conducting just one or two cycles of Lesson Study cannot change quality of questions from a teacher
- Improving quality of teachers' questioning skills is essential to improve students learning
- Continuous support and implementation of Lesson Study is necessary to improve teachers' and students' Higher Order Thinking Skills

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# Appendix 26. CIES 2019
# Presentation Material

# Decentralizing and Contextualizing Teacher Continuous Professional Development in Rwanda

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Yumiko Ono* [3], Sayaka Matsuzuki*[2], Kenji Ohara* [2]

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Japan International Cooperation Agency (JICA) provided data on
Project for Supporting Institutionalizing and Improving Quality of SBI Activity for this study.

# Background

- Rwanda introduced new Competence-based Curriculum (CBC) in 2015.
- Introduction of CBC called for a change in instructional approaches. The role of teachers was transformed from delivering subject content to facilitating students learning.
- To equip teachers with the new instructional approach, Rwanda Education Board conducted a 3-year induction program for all 69,600 teachers from pre-primary to upper secondary education from 2015/16 to 2017/18.
- This program combined a cascade model with school-based CPD to transform theories into classroom practice.
- Rwanda Education Board was responsible for training of trainers in cascade training while sectors and schools organized teacher professional development under the supervision of districts.

## Achievement and challenges of CBC induction program (Iwasaki et al, in press)

The program reached almost all teachers and disseminated school-based CPD culture across the country.

- The program trained 32,500 local trainers in three years.
- As of 2019, 96% teachers have attended some kind of CBC induction program since the launch of the curriculum.
- In 2018, more than 80% of the teachers have attended a school-based CPD regularly at least once a term.
- Teachers tried to make lessons more interactive using group work, singing and clapping. Lessons we observed were different from traditional "chalk-and-talk" type lessons.

However, training coverage was limited and quality of school-based trainings is barely known.

- The program were unable to ensure all teachers are trained.
- In 2018, 12% of teachers never attended school-based CPD.
- Post-training test conducted to local level trainers found out that the level of understanding of some trainers was worrisome.
- Class discourse analysis found that application of the instructional approaches teachers learned in the induction program remained superficial.



## Research question and method

- Now that main phase of CBC induction program is over, it is important to make sure that all teachers engage in school-based continuous professional development (CPD) and continuously improve their lessons.
- It has been suggested that school-based CPD is a cost-effective way of teacher professional development (Iwasaki et al., in press) and effective in improving students engagement in the class (Yoshikawa et al., 2015) and academic achievement (REB, 2015) in Rwanda.
- In CBC induction program, while 80% of teachers attended school-based CPD at least once a term, 12% have never attended one.
- What are the obstacles for these teachers to attend CPD? What is needed to remove these obstacles?

# Factors that influence teachers' participation to school-based CPD

Mutsinzi et al (2017) identified following five factors which influence teachers' participation to school-based CPD in Rwanda by applying exploratory factor analysis. We grouped teachers into three by their participation to school-based CPD, 1) fully attended, 2) partly attended and 3) not attended and compared responses to questions related to CPD.

- Shared school vision
- Participatory school management
- Collegiality for lesson improvement
- Evidence-based school planning
- Resource persons



# Outline of the survey

| Items | Description |
|---|---|
| Survey objectives | • Evaluate understanding of CBC concept of teachers, HTs, other education beneficiaries, practitioners and stakeholders.<br>• Evaluate the impact of CBC induction program<br>• Assess needs and analyze gaps in the implementation of CBC to inform next steps |
| Target area | Nationwide (90 among 416 sectors in all 30 districts) |
| Target group | Teacher, Head teachers, Sector Education Officers (Local education officers), District Director of Education (DDEs) |
| Methods | Sampling survey using online questionnaire (Google form) |
| Sampling method | 3 schools from each district were selected from the list of schools where the government installed an internet connection with the following criteria.<br>- Schools are in different sectors.<br>- Schools are in different levels (pre-primary, primary, secondary)<br>* Teachers and head teachers in these schools and neighboring schools were also invited. |

# Sample size

| Target group | Plan | Actual | Coverage against target | coverage against all |
|---|---|---|---|---|
| Teachers | 6,266 | 4,178 | 66.7% | 6.0% |
| Head teachers | 1,369 | 497 | 36.3% | 11.2% |
| SEOs (Local education officers) | 90 | 87 | 96.6% | 20.9% |
| DDEs | 30 | 22 | 73.3% | |

Note: "Coverage against all" for teachers and head teachers are based on number of teachers (69,602) and head teachers (4,412) in 2017 Education Statistics (MINEDUC, 2018)

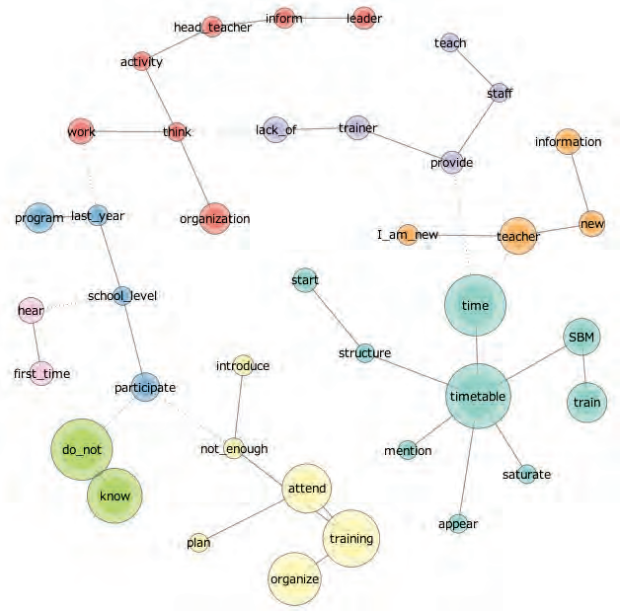


# Analytical procedure

- In the online questionnaire, teachers were asked how frequently they attended school-based CPD in 2018. If the answer is "never", they describe the reason why. Similarly, local education officers were asked to describe the challenges around CPD. Both were open-ended question.
- To understand obstacles of CPD, we applied text mining to responses to these questions. A free software called KH Coder was used for this analysis.
- Text mining helps objectively identify words ("morphemes", the smallest meaningful unit of language) of frequent appearance and visualize intensity of their relationship by classifying them into groups ("communities").

## The intensity of co-occurrence relationships among morphemes 1: Challenges of CPD by teachers who never attended CPD this year.

Primary and secondary teachers who never attended school-based CPD (*N*=414) described reasons why they never attended. Among them, 389 had valid responses were analyzed. 39 morphemes with high frequency were used to draw co-occurrence network diagram (below). Morphemes with higher frequency are indicated as bigger circle. Words were automatically grouped and separated by color.



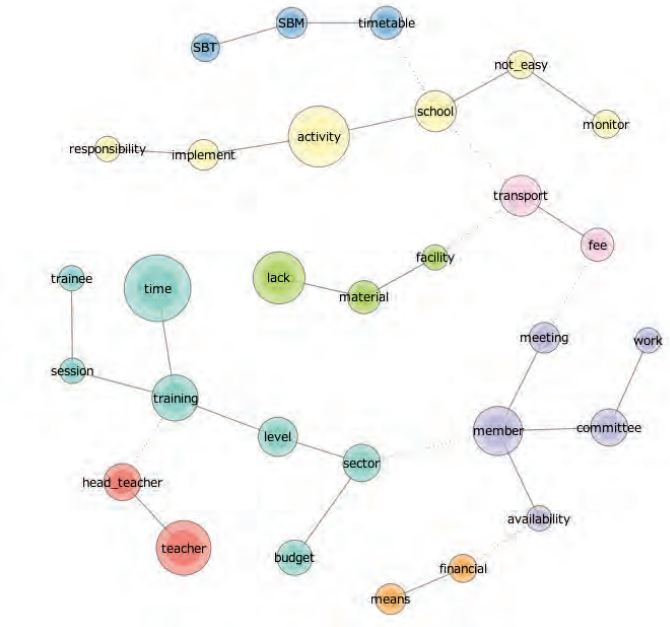

Eight groups were extracted which can be named;

1. Time/timetable
2. Trainers
3. Head teacher/school leadership
4. New teacher
5. Awareness 1 (no knowledge)
6. Awareness 2 (first time to hear)
7. Not planned, organized or introduced
8. Attended last year



## The intensity of co-occurrence relationships among morphemes 2: Challenges of CPD by Local Education Officers

After the initial screening, 120 valid responses from local education officers were used for this analysis. 30 morphemes with high frequency were used to draw co-occurrence network diagrams. Morphemes with higher frequency are indicated as bigger circle. Words were automatically grouped and separated by color.




Eight groups were extracted which can be named;

1. Time and budget
2. Financial means
3. Head teacher
4. Resource persons' timetable
5. Difficulties of monitoring of school-based activity
6. Lack of material and facility
7. Transport fee
8. Availability of committee member

# Obstacles for CPD

Co-occurrence network diagrams suggest following are the obstacles of CPD perceived by teachers and local education officers. Bold letters indicate common obstacles perceived by both teachers and local education officers.

Teachers

- **Lack of time/Busy timetable**
- **Lack of resource persons and their capacity**
- **Unsupportive school leadership**
- Lack of awareness

Local Education Officers

- **Lack of time**
- **Lack of resource persons and their capacity**
- **Unsupportive school leadership**
- Unable to monitor school-based activities
- Lack of budget
- Lack of transport means and fees
- Insufficient materials
- Unable to coordinate at sector-level



# Discussion (1)

## Obstacles perceived both by teachers and local education officers

- Lack of time is the biggest obstacle.
  - Double-shift for primary school teachers.
  - Average lessons per week: 44 for primary and 34 for secondary teachers (REB, 2018)
  - Some good practices have been observed to arrange timetable so that teachers in the same department can have CPD in a specific day of the week (REB, 2015).
- Unavailability and insufficient capacity of resource persons
  - Distribution of scores of post-training test in CBC induction program suggested some trainers performed extremely poorly (Iwasaki, et al. forthcoming).
  - No systemic ongoing support, follow-up or community of practice existed for these trainers.
- Unsupportive school leadership
  - Results of this study confirmed the findings of previous studies (e.g. Mutsinzi et al, 2017, Yoshikawa et al, 2015) that suggest importance of supportive school leadership and good school management to create conducive environment for school-based CPD.

# Discussion (2)
## Obstacles perceived by local education officers

- **Budget is one of the obstacles for CPD for local education officers but not teachers.**
  - Currently no budget is available at school level to buy materials for CPD, or to pay for transport to go to other schools for CPD after re-centralization of this part of capitation grant (Williams, 2017).
  - However, teachers don't feel lack of budget is the obstacle, which confirms one of the benefits of school-based CPD, i.e. low cost.
- **No functional monitoring system due to inherent challenge of decentralization**
  - In the CBC induction program, a comprehensive monitoring system was planned for but not fully implemented
  - Local education officers who are supposed to perform this task are not accountable to the Rwanda Education Board (Honeyman, 2017). They were given this task without proper institutional, technical and financial support from the central level (Iwasaki et al., forthcoming).
  - Due to lack of monitoring, teachers' needs for professional development is not systemically assessed and informing policy level.
  - Incoherent use of terminologies (e.g. CPD, peer learning, school-based training, etc) brings confusion and makes monitoring difficult.



# Conclusion

- Findings from this study confirmed importance of effective resource persons and supportive school leadership, as suggested by previous studies. Community of practice for resource persons should be established. Reasons behind unsupportive school leadership should be further investigated.
- They also suggest lack of time is the major obstacle for teachers' attendance to CPD. Mitigating the teaching load for primary school teachers will be the key. Interestingly absence of financial incentives is not an obstacle for teachers, but the costs incurred by school-based CPD (e.g. to buy materials and/or pay for transport for monitoring) should be compensated. Administrative arrangement that enables local education officers to conduct monitoring is also necessary.
- Establishing truly conducive environment for CPD requires a systemic reform. These obstacles (i.e. time, budget and monitoring) can be mitigated only by altering administrative or financial arrangement within the government. This includes abolishing double shift for all grades in primary schools, re-decentralizing capitation grant for teacher CPD and rearranging reporting line of local education officers.
- Some of the factors that are identified in this study coincide with model of effective professional development proposed by Darling-Hammond, Hyler and Gardner (2017). This suggests that these factors are important not only to encourage teachers' participation but also to improve the quality of CPD.

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# Appendix 27. ICET 2019
# Presentation Material

# STRENGTHENING TEACHERS' QUESTIONING SKILLS IN MATHEMATICS AND STUDENTS' HIGHER ORDER THINKING SKILLS THROUGH LESSON STUDY IN RWANDA

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Antoine Mutsinzi, Sakura Group, Ltd
Sayaka Matuszuki, PADECO Co., Ltd

## OUTLINE OF THE PRESENTATION

1. Background of the study
2. Lesson Study as Professional Development Model
3. Lesson Study in SIIQS project
4. Research Questions
5. Tentative results
6. Discussion
7. Tentative Conclusion

# BACKGROUND

- In 2016 Competence-based Curriculum (CBC) introduced in primary and secondary schools in Rwanda
- A significant shift from objective and knowledge-based learning: CBC emphasizes on the development of skills and attitudes required to ensure the learner is competent in the application of knowledge
- Three year CBC induction program (2016-2018)
- JICA Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS Project) launched in Jan 2017 to strengthen implementation of CBC curriculum **in classrooms**

# EVERY TEACHER IS ENCOURAGING AND MOTIVATING LEARNERS TO WORK COLLABORATIVELY IN GROUPS.

S2 Biology Class

P4 Mathematics Class

# TEACHERS ARE RECOGNIZING EFFORTS OF STUDENTS BY CLAPPING, GESTURES AND BY SINGING. THEY ARE FRIENDLY AND SUPPORTIVE.

# SOME TEACHERS PREPARE OWN TEACHING AID.

# OBSERVED ISSUES IN "CBC" LESSONS

## (BLS, 03/2017)

- Jump into group work without instruction or meaningful task. *When is Group work or group discussion effective and helpful?*
- Individual mastery of basic knowledge and skills is a prerequisite for students to be engaged in critical and creative thinking, but NOT emphasized or achieved.
- Students are expected to answer "Yes" to teachers' questions: "Do you understand?" "Are you together?"
- Group activity is NOT closely linked to the lesson objective.
- Every lesson shows a same structure: Introduction, group work, exercise questions for assessment, homework.
- Questions are at low cognitive level, no thinking or no meaningful learning.

# LESSON STUDY AS EFFECTIVE PROFESSIONAL DEVELOPMENT MODEL

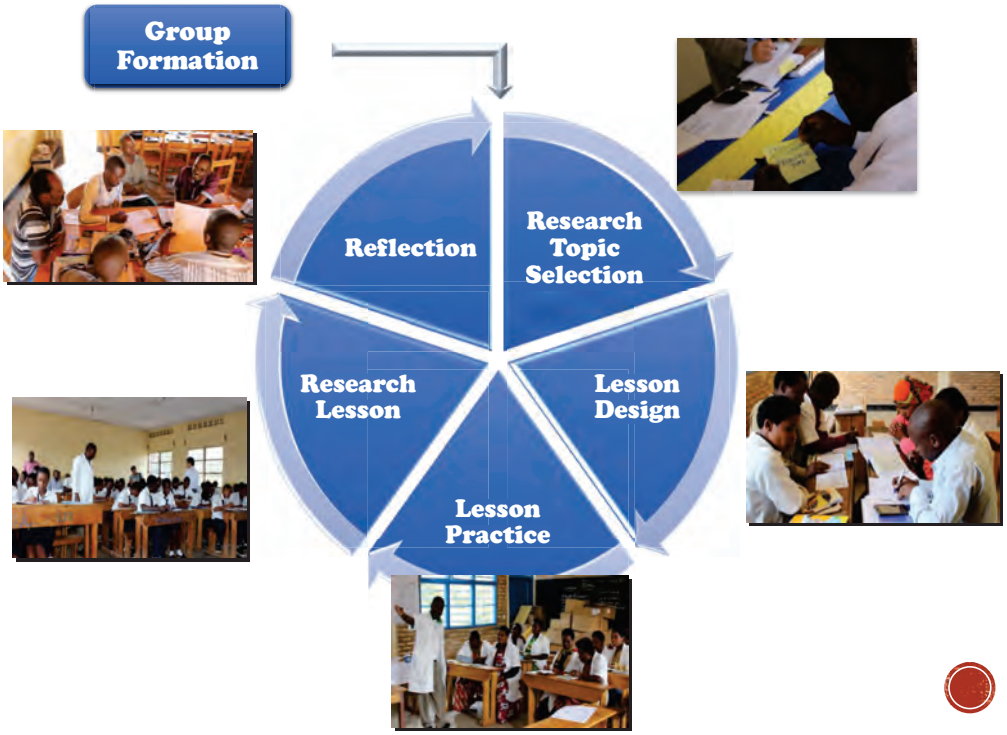
Seven Characteristics of Effective PD

(Darling-Hammond et al, 2017)

1. Is **content focused**
2. Incorporates **active learning** utilizing adult learning theory
3. Supports **collaboration,** typically in **job-embedded contexts**
4. Uses **models and modeling** of effective practice
5. Provides **coaching and expert support**
6. Offers opportunities for **feedback and reflection**
7. Is of **sustained duration**

**These are what Lesson Study is.**

# LESSON STUDY CYCLE




# LESSON STUDY IN MODEL SCHOOLS

**2017**
- Select 5 model schools and formulate the Lesson Study Group for mathematics and science lessons
- Introduce and implement Lesson Study
- Develop model lesson for CBC implementation

**2018**
- Select 4 model schools and set objectives for Lesson Study
- Implement Lesson Study and evaluate the effects

**2019**
- Select 5 models schools and set unit for research lesson
- Implement lesson study and evaluate the effects

1 LS cycle is 4-5 weeks, once a term, one session is 60 to 90 minutes.

# RESEARCH QUESTION: WAS THE LESSON STUDY (PROJECT) EFFECTIVE?

- Was it effective in strengthening teachers' questioning skills?
  - **Discourse analysis**
  - **Teacher interview**

- Was it effective in improving students' higher order thinking skills?
  - **Pre/Post test analysis**

# JOSEPHINE (PSEUDONYM) IN MODEL SCHOOL A

Female, P4-6 Math teacher, 17 years of experience. School is located about 45 km from Kigali. It has 14 classes and 11 teachers. Average achievement and typically rural.

**2017**
- 03/2017 Baseline survey
- 06/2017 Lesson Study

**2018**
- Member of LS group, but
- No research lesson

**2019**
- 02/2019 Lesson Study
- 06/2019 Lesson Study:

# TENTATIVE RESULTS OF DISCOURSE ANALYSIS

## Teacher

| Code | Baseline lesson March 2017(%) | Model lesson June 2017 (%) | Model lesson June 2018 | Model lesson Feb. 2019 |
|---|---|---|---|---|
| Closed Question | 92 (43.4) | 123 (25.7) | 19 (27.1) | 73 (28.7) |
| Open Question | 0 (0.0) | 0 (0.0) | 0 | **2 (0.7)** |
| Instruction | 23 (10.8) | 109 (22.8) | 27 (38.6) | 72 (28.3) |
| Confirmation | 22 (10.4) | 51 (10.7) | 5 (7.1) | 46 (18.1) |
| **Explanation** | **7 (3.3)** | **90 (18.8)** | **3 (4.3)** | **35 (13.8)** |
| Ask Agreement | 0 (0.0) | 0 (0.0) | 0 (0.0) | 2 (0.7) |
| Point student | 33 (15.6) | 38 (7.9) | 5 (7.1) | 6 (2.3) |
| Encouragement | 12 (5.7) | 23 (4.8) | 5 (7.1) | 7(2.8) |
| Justification | 19 (9.0) | 32 (6.7) | 1 (1.4) | 2 (0.1) |
| Others | 4 (1.9) | 12 (2.5) | 5 (7.1) | 9 (3.5) |
| Clap | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Impossible to listen | 0 (0.0) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| **Total** | **212** | **478** | **70** | **254** |

# TENTATIVE RESULTS OF DISCOURSE ANALYSIS

## Students

| Code2 | Baseline lesson March 2017(%) | Model lesson June 2017 (%) | Model lesson June 2018 (%) | Model lesson Feb 2019(%) |
|---|---|---|---|---|
| Yes/No answer to teacher | 30 (20.3) | 47 (24.7) | 15 (37.5) | 37(17.1) |
| One term answer to teacher | 53 (35.8) | 12 (6.3) | 4 (10.0) | 117(54.2) |
| One term answer to student | 0 (0.0) | 0 (0.0) | 0 | 0 |
| Question to teacher | 0 (0.0) | 1 (0.5) | 0 | 0 |
| Question to student | 0 (0.0) | 0 (0.0) | 0 | 0 |
| Opinion to teacher | 0 (0.0) | 0 (0.0) | 0 | **4(1.9)** |
| Opinion to student | 0 (0.0) | 0 (0.0) | 0 | 0 |
| Incomplete answer | 0 (0.c0) | 0 (0.0) | 0 | 3(1.4) |
| **Repeating or just reading** | **12 (8.1)** | **79 (41.6)** | **9 (22.5)** | **4(1.9)** |
| Silent to teacher | 4 (2.7) | 0 (0.0) | 0 | 0 |
| Silent to student | 0 (0.0) | 0 (0.0) | 0 | 0 |
| Point student | 0 (0.0) | 0 (0.0) | 0 | 0 |
| Clap | 3 (2.0) | 0 (0.0) | 0 | 2(0.9) |
| Writing or gesture to teacher | 14 (9.5) | 0 (0.0) | 7 (17.5) | 0 |
| Writing or gesture to student | 0 (0.0) | 0 (0.0) | 0 | 0 |
| Impossible to listen | 3 (2.0) | 0 (0.0) | 0 | 0 |
| Others | 29 (19.6) | 51 (26.8) | 5 (12.5) | 49(22.7) |
| **Total** | **148** | **190** | **40** | **216** |

# MODEL LESSON ON FEB. 2019

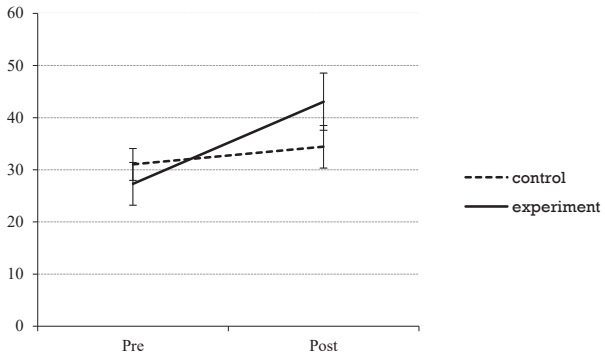
- More students' talk (216:254) e.g.(148:212) 03/2017
- Emergence of a probing question and student's answer by sentence
  - *T: Why is 284 divisible by 2?*
  - *S: Because a number divisible by 2 when it ended by 4.*
- BUT it was reteaching.

Why did you decide to reteach the same lesson?

- *The specific lesson, I taught for the first time but without more focus. …..Second, I also repeat the lesson to help learners to be familiar with rules and know how to apply.*
- *(Translated from KinyaRwanda)*

# PRE/POST TEST ANALYSIS (06/2019)

| | School A (n=34) | School B (n=61) |
|---|---|---|
| Pre-test | 27.3 (9.2) | 31.0 (13.3) |
| Post-test | 43.1 (14.3) | 34.4 (17.6) |




Control (B)-Pre/Post: $F(1,93)= 2.667$

Experimental (A)-Pre/Post: $F(1,93)= 32.003^{**}$

** $p<.01$

# DISCUSSION

- The teacher is positive about Lesson Study and she believes her teaching has been changed since the introduction of LS.
- Questioning skills of Josephine did not show a significant difference between the baseline and the endline
- Against effective PDM, some conditions were not met: providing coaching and expert support, sustained duration
- Proficiency level of English seems a challenge: learners understood English very little, teacher poses and repeats low level closed questions.

# (CONT)

- The problem of textbooks: teachers' guide does not provide useful/helpful model/suggestions to develop questions requiring higher order thinking.
- Textbooks is organized from abstract (definition) to concrete so that learners remember the rules without understanding.
- Students absenteeism, little family or community support

# TENTATIVE CONCLUSION

- Was it effective in strengthening teachers' questioning skills?

*Not confirmed in the case study. Project related issues (frequency of professional support, and duration) and teacher and learner related issues (language).*

- Was it effective in improving students' higher order thinking skills?

*It depends on teacher questions. Students' language level, textbook organization may have negative effect.*

# TENTATIVE CONCLUSION

- Improving quality of teachers' questioning skills is essential to improve students learning.
- Level of Students' talk in classrooms are influenced by teacher questions and instructions.
- Students' level of English proficiency may affect question types.
- Conducting one or two cycles of Lesson Study cannot change quality of teacher questions.
- More frequent and sustained professional support is critical, more input/support at planning stage.
- Continuous support and implementation of Lesson Study is necessary to improve teachers' and students' Higher Order Thinking Skills

# ACKNOWLEDGEMENT


- JICA granted a permission to use the data from SIIQS project for this presentation. Interpretations are ours and any errors are the responsibility of the authors.

# Appendix 28. WALS 2019
# Presentation Material

# A CASE STUDY OF TEACHER LEARNING AND TEACHER CHANGE THROUGH LESSON STUDY AS SCHOOL-BASED CPD


- Yumiko Ono, Waseda University
- Sayaka Matsuzuki, PADECO Co., Ltd
- Ryuichi Sugiyama, PADECO Co., Ltd
- Kizito Ndihokubwayo, REB/SIIQS
- Antoine Mutsinzi, Sakura Group, Ltd
- Hashituky Telesphore Habiyaremye, REB/SIIQS



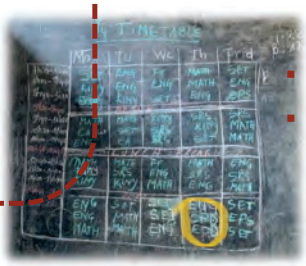

# 1. BACKGROUND

- In 2016 Competence-based Curriculum (CBC) introduced in primary and secondary schools in Rwanda
- A significant shift from objective and knowledge-based learning: CBC emphasizes on the development of skills and attitudes required to ensure the learner is competent in the application of knowledge
- Three-year CBC induction program (2016-2018:Yoshikawa et al, 2019)
- JICA Project for Supporting Institutionalizing and Improving Quality of SBI Activity (SIIQS Project) launched in Jan 2017 to strengthen implementation of CBC curriculum **in classrooms**

# SIIQS APPROACH – DEVELOP CLASSROOM TEACHERS AND ESTABLISH ENABLING ENVIRONMENT

## Component 1: Develop Competent Teacher

- Effective implementation of CBC lessons
  - **Plan**
    - **Lesson Planning**
  - Practice
  - **Play (Facilitation)**
    - **Questioning**
  - Reflect (assess)



## Component 2: Establish CPD support framework

- Consolidate Professional cycle
  - Plan
  - **Practice**
    - **Engage teachers in CoP through DCC/SCC**
    - **Install CPD time in schools**
  - Play (Facilitation)
  - **Reflect (assessment)**
    - **Monitoring CPD/CoP through DCC/SCC**



| Code | Baseline lesson March 2017(%) |
|---|---|
| Closed Question | 92 (43.4) |
| Open Question | 0 (0.0) |
| Instruction | 23 (10.8) |
| Confirmation | 22 (10.4) |
| Explanation | 7 (3.3) |
| Ask Agreement | 0 (0.0) |
| Point student | 33 (15.6) |
| Encouragement | 12 (5.7) |
| Justification | 19 (9.0) |
| Others | 4 (1.9) |
| Clap | 0 (0.0) |
| Impossible to listen | 0 (0.0) |
| Total | 212 |

# OBSERVED ISSUES IN "CBC" LESSONS (BLS, 03/2017)

- Every lesson shows a same structure: Review of previous lesson, group work, exercise questions for assessment, homework.
- Jump into group work without instruction or meaningful task.
- Group activity is NOT closely linked to the lesson objective.
- Questions are at low cognitive level, no thinking or no meaningful learning.
- Students are expected to answer "Yes" to teachers' questions: "Do you understand?" "Are you together?"
- Individual mastery of basic knowledge and skills is a prerequisite for students to be engaged in critical and creative thinking, but NOT emphasized or achieved.

# 2. LESSON STUDY IN SIIQS PROJECT

**2017**
- Select 5 model schools and formulate the Lesson Study Group for mathematics and science lessons
- Introduce and implement Lesson Study
- Develop model lesson for CBC implementation

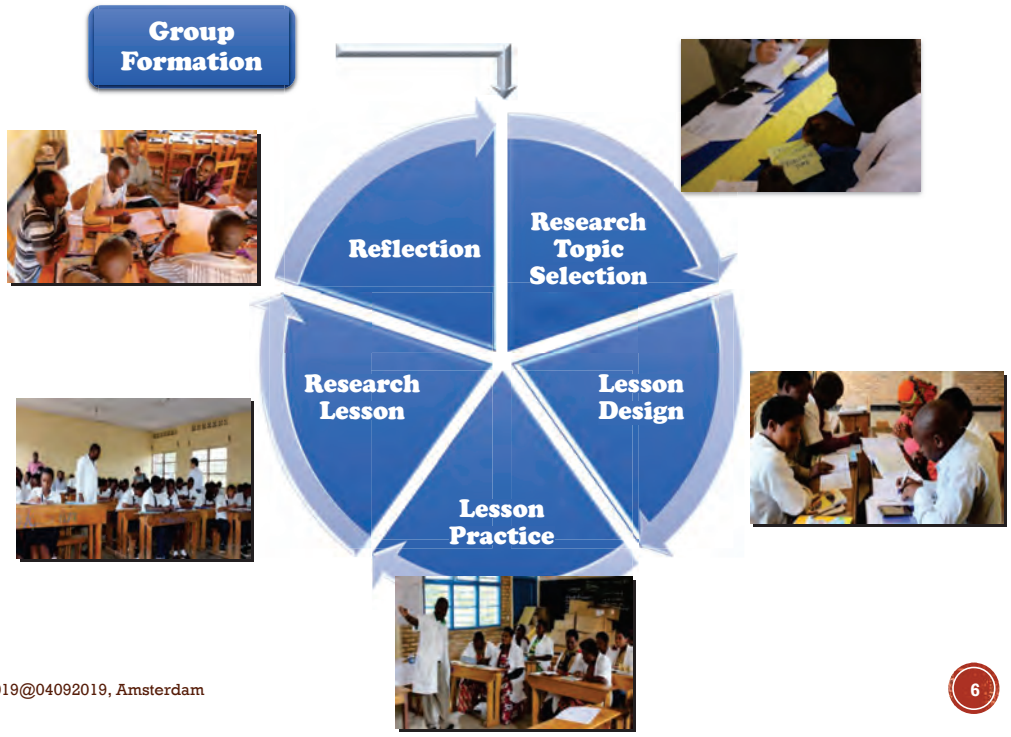
**2018**
- Select 4 model schools and set objectives for Lesson Study
- Implement Lesson Study and evaluate the effects

**2019**
- Select 5 model schools and set unit for research lesson
- Implement lesson study and evaluate the effects

1 LS cycle is 4-5 weeks, once a term, one session is 60 to 90 minutes.



# LESSON STUDY CYCLE IN SIIQS



# 3. RESEARCH QUESTIONS

- What did teachers learn from LS experience?
  - **Lesson plan**
  - **Teacher questionnaire**
  - **Focus group interview**

- What did a teacher learn and how did she change in her lesson presentations over three years?
  - **Discourse analysis**
  - **Teacher questionnaire**
  - **Teacher interview**

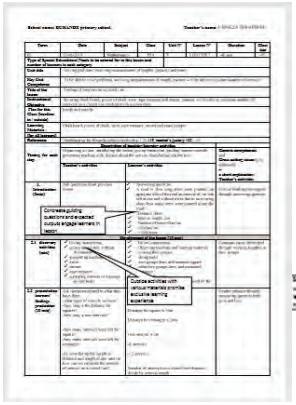


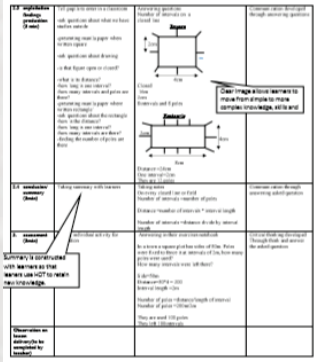
# RQ1: WHAT DID TEACHERS LEARN FROM LS EXPERIENCE?

8

Collect data from 6 Experimental Schools (LS Model Schools) and 5 Control Schools (comparable in location, community organization and national test results) for comparison

- ✓ Lesson plan
- ✓ Teacher Questionnaire Survey
- ✓ Focus group interview





# LESSON PLAN

- Clear objective
- concrete guiding questions to achieve the objective
- Clear visual materials helping learners from simple to complex questions
- Small steps to achieve the objectives
- Summary constructed with learners



# LESSON PLAN

Elements specified in National Teacher CPD FW:
0: None, 1: Poor, 2: Fair, 3: Good

| Group | Level | *N* | | Clear and measurable outcomes and objectives and activities to achieve them. | | | | How key knowledge and skills develop over time. | | Regular revision of learning and learning assessments. | | Adaptions for specific learners. | | Plan to use a range of TLRs and interaction patterns within and between different lessons. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Clear and measurable outcomes and objectives | | Activities to achieve them | | | | | | | | | |
| | | BLS | ELS | BLS | ELS | BLS | ELS | BLS | ELS | BLS | ELS | BLS | ELS | BLS | ELS |
| EXP | **PS** | **14** | **6** | **1.3** | **3.0** | **0.9** | **2.3** | **0.0** | **0.5** | **0.7** | **2.0** | **0.1** | **0.3** | **1.1** | **2.0** |
| | Math | 10 | 3 | 1.3 | 3.0 | 0.6 | 2.7 | 0.0 | 0.0 | 0.4 | 2.3 | 0.0 | 0.7 | 0.8 | 2.0 |
| | Science | 4 | 3 | 1.3 | 3.0 | 1.8 | 2.0 | 0.0 | 1.0 | 1.5 | 1.7 | 0.3 | 0.0 | 1.8 | 2.0 |
| | **O' Level** | **4** | **10** | **1.3** | **3.0** | **1.5** | **2.3** | **0.0** | **0.5** | **1.3** | **1.4** | **0.3** | **0.5** | **1.5** | **2.0** |
| | Math | 1 | 4 | 1.0 | 3.0 | 1.0 | 2.3 | 0.0 | 0.0 | 1.0 | 1.5 | 0.0 | 1.0 | 1.0 | 2.0 |
| | Science | 3 | 6 | 1.3 | 3.0 | 1.7 | 2.3 | 0.0 | 0.8 | 1.3 | 1.3 | 0.3 | 0.2 | 1.7 | 2.0 |
| | **A' Level** | **4** | **7** | **1.8** | **3.0** | **1.5** | **2.3** | **0.8** | **0.3** | **0.8** | **1.4** | **0.0** | **0.4** | **1.8** | **2.0** |
| | Math | 3 | 4 | 2.0 | 3.0 | 1.7 | 2.0 | 1.0 | 0.0 | 1.0 | 1.8 | 0.0 | 0.3 | 2.0 | 2.0 |
| | Science | 1 | 3 | 1.0 | 3.0 | 1.0 | 2.7 | 0.0 | 0.7 | 0.0 | 1.0 | 0.0 | 0.7 | 1.0 | 2.0 |
| | **Average** | **22** | **23** | **1.4** | **3.0** | **1.1** | **2.3** | **0.1** | **0.4** | **0.8** | **1.6** | **0.1** | **0.4** | **1.3** | **2.0** |
| CTR | **PS** | **12** | **2** | **2.3** | **3.0** | **2.3** | **2.0** | **0.0** | **0.0** | **1.3** | **0.5** | **0.2** | **0.5** | **1.2** | **2.0** |
| | Math | 9 | 1 | 2.2 | 3.0 | 2.2 | 2.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.1 | 0.0 | 0.8 | 2.0 |
| | Science | 3 | 1 | 2.3 | 3.0 | 2.3 | 2.0 | 0.0 | 0.0 | 0.7 | 1.0 | 0.3 | 1.0 | 2.3 | 2.0 |
| | **O' Level** | **6** | **3** | **1.7** | **1.7** | **1.5** | **2.0** | **0.5** | **0.0** | **0.7** | **0.3** | **0.0** | **1.3** | **0.5** | **2.0** |
| | Math | 1 | | 3.0 | | 3.0 | | 0.0 | | 0.0 | | 0.0 | | 0.0 | |
| | Science | 5 | 3 | 1.4 | 1.7 | 1.2 | 2.0 | 0.6 | 0.0 | 0.8 | 0.3 | 0.0 | 1.3 | 0.6 | 2.0 |
| | **A' Level** | **4** | **1** | **1.8** | **3.0** | **1.5** | **3.0** | **0.0** | **0.0** | **0.8** | **0.0** | **0.0** | **1.0** | **0.5** | **2.0** |
| | Math | 1 | 1 | 1.0 | 3.0 | 1.0 | 3.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 2.0 |
| | Science | 3 | | 2.0 | | 1.7 | | 0.0 | | 1.0 | | 0.0 | | 0.7 | |
| | **Average** | **22** | **6** | **2.0** | **2.3** | **1.9** | **2.2** | **0.1** | **0.0** | **1.0** | **0.3** | **0.1** | **1.0** | **0.9** | **2.0** |
| EXP | | 22 | 23 | 1.4 | 3.0 | 1.1 | 2.3 | 0.1 | 0.4 | 0.8 | 1.6 | 0.1 | 0.4 | 1.3 | 2.0 |
| CTR | | 22 | 6 | 2.0 | 2.3 | 1.9 | 2.2 | 0.1 | 0.0 | 1.0 | 0.3 | 0.1 | 1.0 | 0.9 | 2.0 |

# BETTER UNDERSTANDING OF CBC LESSONS?

| 1: strongly disagree, 2: disagree, 3: agree, 4: strongly agree | | N=55 EXP | N=46 CTR | |
|---|---|---|---|---|
| (a) | CBC should always include groupwork. | 2.47 | 2.92 | * |
| (b) | Lesson conclusion should be given by teacher. | 2.40 | 2.68 | |
| (c) | Blackboard writing should be erased when students solve assessment question at the end of a lesson. | 2.33 | 2.74 | + |
| (d) | When a student gives a wrong answer, teacher should call another student to get correct answer immediately. | 2.09 | 2.13 | |
| (e) | When students do not understand a concept, it is because students do not study harder. | 1.76 | 1.92 | |
| (f) | When students do not understand a concept, it is because the teacher did not use effective strategies. | 2.58 | 2.68 | |
| (g) | Teachers should rely on students' oral responses than students' face expressions and behaviors for formative assessment. | 2.20 | 2.63 | * |
| (h) | To treat learners equal, teachers should provide the same instruction to all learners regardless of their understanding. | 3.04 | 2.95 | |
| (i) | Calling on students purposefully who make mistakes is good learning opportunities for the class. | 2.91 | 2.87 | |
| (j) | I encourage my students to explain why they reached a certain answer in my class. | 3.56 | 3.50 | |
| (k) | I give students enough time to think before they answer a question. | 3.51 | 3.61 | |
| (l) | I encourage my students to apply their learning to real life situations. | 3.67 | 3.76 | |
| (m) | Good questions should have only one correct answer. | 2.27 | 2.24 | |
| (n) | Students should respond to questions immediately. | 2.04 | 2.24 | |
| (o) | Lesson should introduce one particular and standard solution only. | 2.29 | 2.18 | |

N=101

*$p$<.05, +$p$<.10



# FOCUS GROUP INTERVIEW

- "Lesson study is one of the most appropriate CPD model that have helped us to improve our classroom practice" (teachers of EP Buhande at the ELS)
- "LS has been a good opportunity for teachers to sit together to discuss issues in teaching and learning process, challenge one another and learn from each other. LS is helping much in transforming curriculum to competences." (HT of GS Mukarange at the Workshop with model schools)
- "Teachers' attitudes and behaviors have gradually changed and we can attribute this change to LS. Through the course of LS, teachers have been able to open and reveal their weaknesses and welcomed their fellow teachers for support" (DOS of APAGIE Musha at the Workshop with model schools)

# RQ2: WHAT DID JOSEPHINE LEARN AND HOW DID SHE CHANGE IN HER LESSON PRESENTATIONS OVER THREE YEARS?

13

- ✓ Discourse analysis of video recorded lessons
- ✓ Teacher interview
- ✓ Teacher Survey questionnaire



# JOSEPHINE (PSEUDONYM) IN MODEL SCHOOL A

Female, P4-6 Math teacher, 17 years of experience. School is located about 45 km from Kigali. It has 14 classes and 11 teachers. Average achievement and typically rural.

**2017**
- 03/2017 Baseline survey
- 06/2017 Lesson Study

**2018**
- Member of LS group, but no research lesson

**2019**
- 02/2019 Lesson Study
- 06/2019 Lesson Study:

# PRELIMINARY RESULTS OF DISCOURSE ANALYSIS

## Teacher

| Code | 03/2017 | 06/2017 | 06/2018 | 02/2019 | 06/2019 |
|---|---|---|---|---|---|
| Explanation | 7(3.3) | 75(18.0) | 6(7.6) | 35 (13.8) | 18(8.7) |
| Closed Question | 92(43.2) | 89(21.4) | 13(16.5) | 73 (28.7) | 73(35.3) |
| Open Question | 1(0.5) | 0 (0.0) | 0 (0.0) | 2 (0.7) | 2(1.0) |
| Rephrase teacher | 0 (0.0) | 1(0.2) | 9(11.4) | | 18(8.7) |
| Rephrase student | 0 (0.0) | 0(0.0) | 5(6.3) | | 7 (3.4) |
| Call attention | 0 (0.0) | 36(8.7) | 2(2.5) | | 20 (9.7) |
| Point student | 33(15.5) | 37(8.9) | 15(19.0) | 6 (2.3) | 20 (9.7) |
| Confirmation | 22(10.3) | 49(11.8) | 5(6.3) | | 13 (6.3) |
| Instruction | 23(10.8) | 81(19.5) | 19(24.1) | 72 (28.3) | 13 (6.3) |
| Encouragement | 12(5.6) | 37(8.9) | 3(3.8) | 7(2.8) | 14 (6.8) |
| Justification | 19(8.9) | 0 (0.0) | 2(2.5) | 2 (0.1) | 0(0.0) |
| Clap | 0(0.0) | 0 (0.0) | 0(0.0) | 0 (0.0) | 0(0.0) |
| Inaudible | 0(0.0) | 0 (0.0) | 0(0.0) | 0 (0.0) | 0 (0.0) |
| Others | 4(1.9) | 11(2.6) | 0(0.0) | 9 (3.5) | 9(4.3) |
| Total | 213 | 416 | 79 | 254 | 207 |



# PRELIMINARY RESULTS OF DISCOURSE ANALYSIS

## Students

| Code | 03/2017 | 06/2017 | 06/2018 | 02/2019 | 06/2019 |
|---|---|---|---|---|---|
| Yes / No answer to teacher | **30(20.3)** | **48(25.3)** | **5(13.5)** | **37(17.1)** | **8(9.4)** |
| Yes / No answer to another student | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **1(1.2)** |
| One term answer to teacher | **53(35.8)** | **90(47.4)** | **15(40.5)** | **117(54.2)** | **48(56.5)** |
| One term answer to another student | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| Question to teacher | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **2(2.4)** |
| Question to another student | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| Opinion to teacher | **0(0.0)** | **0(0.0)** | **0(0.0)** | **4(1.9)** | **7 (8.2)** |
| Opinion to another student | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| Incomplete answer | **0(0.0)** | **0(0.0)** | **3(8.1)** | **3(1.4)** | **0(0.0)** |
| Repeating or just reading | **12(8.1)** | **0(0.0)** | **8(21.6)** | **4(1.9)** | **3 (3.5)** |
| Silent to teacher | **4(2.7)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| Silent to another student | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| Point student | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| Presentation | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| Clap | **3(2.0)** | **0(0.0)** | **0(0.0)** | **2(0.9)** | **1(1.2)** |
| Writing or gesture to teacher | **14(9.5)** | **2(1.1)** | **6(16.2)** | **0(0.0)** | **0(0.0)** |
| Writing or gesture to another student | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** | **0(0.0)** |
| Inaudible | **3(2.0)** | **1(0.5)** | **0(0.0)** | **0(0.0)** | **1(1.2)** |
| Others | **29(19.8)** | **49(25.8)** | **0(0.0)** | **49(22.7)** | **14(16.5)** |
| Total | **148** | **190** | **37** | **216** | **85** |

# IN DEPTH INTERVIEW MARCH 2017: FIRST VISIT

**How did you feel?**

*That time you surprised me and I was even frustrated. I was trembling.* (Why?) *Do you know about seeing white people coming to your classroom, that time head teacher told me about that visit just in morning, we did not know which materials we have to use, I failed and I really got ashamed.*



# JUNE 2017: FIRST LESSON STUDY

*Oh my God! But it is so long I may get difficulty in remembering.*

*In that time, in 2017 I tried my best though I did not know what Lesson Study is.*

**(Suggestions during lesson planning and in post lesson discussion)**

*I remember one; I talked more than learners, others I do not remember*

# JUNE 2018: SECOND YEAR OF LESSON STUDY

**Why Nyiraneza, not you, taught research lesson?**

*I claimed to give opportunity to another one so that I also get opportunity to observe how other people do.*

*Another reason is that we wanted to change class. I was in P4 and P5 both in 2017 and 2018, so we put it in P6 because learners in P6 at least can try English.*

*It was step by step of lesson development from CBC. She did not talk much instead she gave opportunity to learners to work.*



# FEB 2019: RETEACHING A SAME LESSON

*In divisibility test, I planned, after we planned we sent to you and you gave feedback, we again planned.*

*It (reteaching) is not allowed I know but from microteaching, we got how we can improve. …Anyway, since I repeated the lesson, as the learners already saw it, therefore they well understood in the second lesson.*

*You cannot hesitate to repeat the lesson. When you see learners do not understand, what can you do? If you are a teacher, what can you do?* (repeat?) *not only repeat. We have also to find materials.*

(helpful suggestion? ) …..*some time we were asking normal questions, but from that time we started to ask learners "why" question*

# JUNE 2019: OUTSIDE ACTIVITY, CAMERA CREW

*I planned that learners will measure using decameter, but that day, they failed. We already learnt line, they knew object, but the mixed up everything on spot. Anyway, they did what they can do as children. You see, in the playground outside the classroom, the learners mixed up the work. Some who were supposed to measure rectangle measured the square and vice versa. We skipped the presentation. Since the data were mixed up, I saw it may cause confusion and I chose to present myself.*

(If you teach again, how?)

*Maybe I can put it in 2 periods.* (Why?) *The activities taken place outside classroom took time and I should give learners enough guidelines*



# JUNE 2019: OBSERVATION OF LESSON IN OTHER MODEL SCHOOL

*Before observation, they gave us lesson plan, so they requested us to look at the methodology, teacher activity, and learners activities.*

(**Suggestion to the teacher**) *The teacher was good but there was no new knowledge. I suggested that teacher should have something new in the lesson. I also figured out that the teacher repeated the lesson. Learners knew everything. Therefore, I suggested teaching a new lesson.*

# LEARNING THROUGH LESSON STUDY

(**a few things you learned until now**) *first, I am confident. For example, even at my school, other than those who took initiative to teach, others it is difficult to teach in front of observers as we did.*

*CBC implementation, planning a lesson with instructional objectives and prepare materials for it.*



# MOST IMPORTANT STAGE OF LS

*So, all of them are important but problem identification is more important than the rest.* **(Why?)** *because you cannot teach learners if you do not know their problem.*

# DO YOU SEE ANY IMPROVEMENT IN STUDENTS' LEARNING?

*Not much.* **(why?)** *There are many reasons. Imagine a learner in P5 during divisibility test of 2 lesson, and that learner does not know the multiplication table of 2, what will happen?*

**(basic knowledge?)** *Lack of basic knowledge is still a problem. Again, if you have 45 learners, among them in P2 only 5 of them master multiplication table of 2, when they shift to P3, they lean multiplication table of 3, and you find among the 5 learners who knew multiplication table of 2 remain 3. You can see what will happen in P4 and P5.*



# LS AND TEACHER CHANGE MODEL

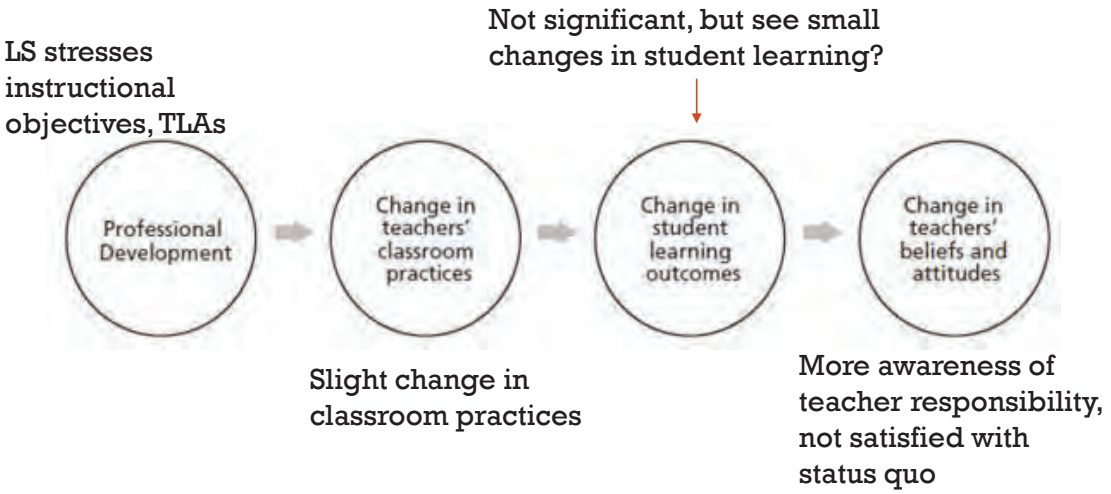
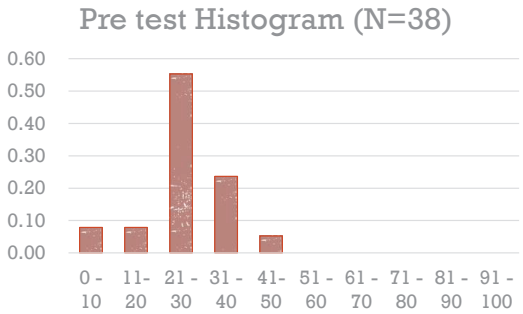
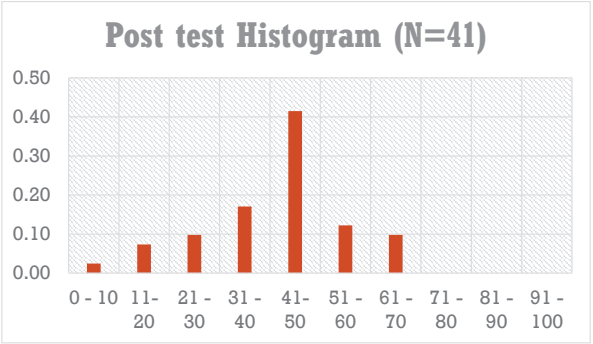



Figure 1: Guskey's model of teacher change. (Guskey, 1986, p7)

## Second term (June 2019) Pre-Post Test Score Distributions P5 Math (Josephine's class)




**Class Average Score from 28% to 42%**

# 4. SUMMARY

- General perception of teachers on LS is positive and an improvement can be observed in lesson plan writing.
- A case study revealed more attention and care on learners and some signs of further improvement if LS is sustained and professional support is provided (researching on content, sequence of content presentation, material development, etc: See Darling-Hammond et al, 2017)
- She is aware of the need of early intervention: poor basic skills in early grade become an impediment for later learning.
- Well coordinated efforts for improvement is necessary for positive impact on students' learning: curriculum organization, textbook and teacher support materials development, administrative support.

# ACKNOWLEDGEMENT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