Report on the Endline Survey of SMASTE School-Based CPD Program

Prepared by:

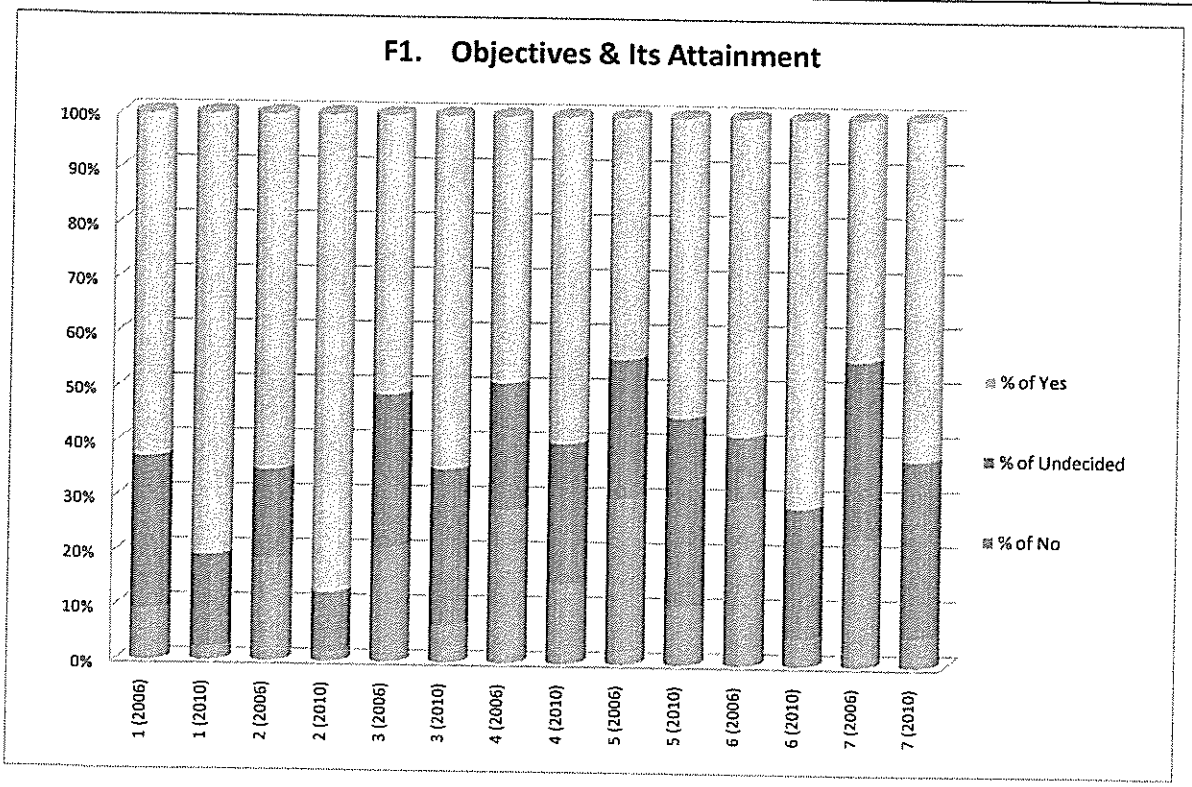
Republic of Zambia
Ministry of Education
in collaboration with
Japan International Cooperation Agency (JICA)

September 2010

Result of Supplementary Analysis of Lesson Observation　(Central Province)
Item by Item Comparison between 2006 (baseline) and 2010 (endline)

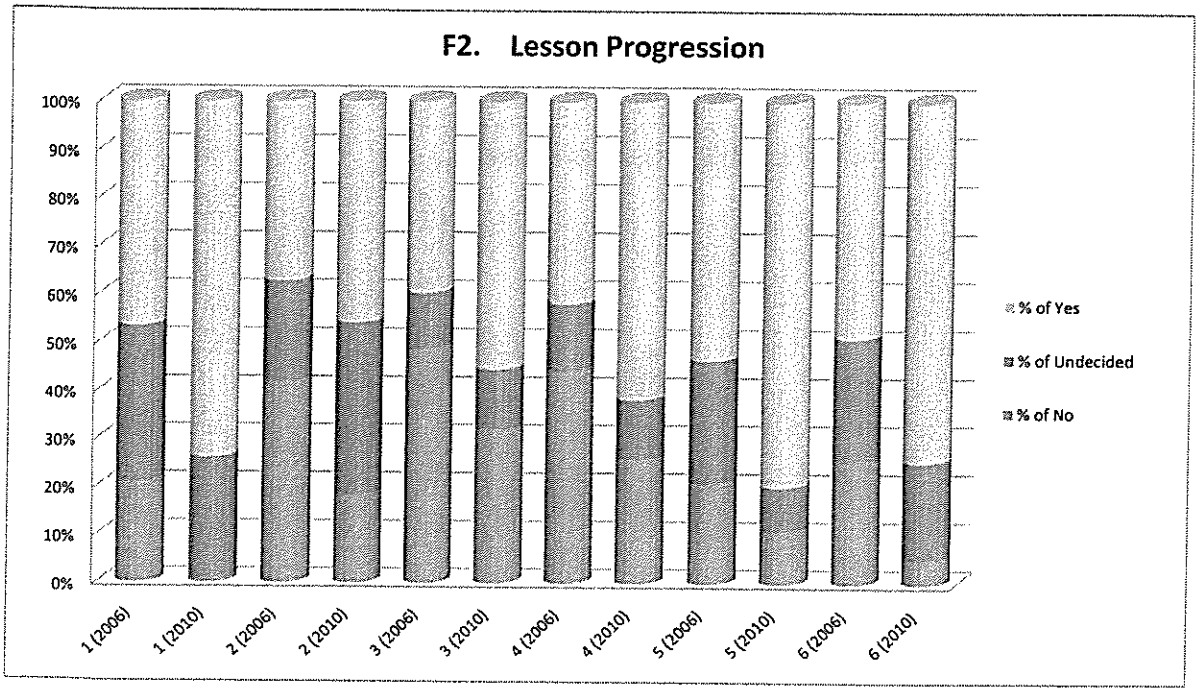
Year	2006	2010
Total # of observations	43	120

F1.	Objectives & Its Attainment	Year	N	% of No	% of Undecided	% of Yes
1	Are the lesson objectives clearly stated in the lesson plan?	1 (2006)	43	9%	28%	63%
		1 (2010)	120	3%	17%	81%
2	Can the stated objectives be attained in a lesson?	2 (2006)	43	19%	16%	65%
		2 (2010)	119	2%	11%	87%
3	Are the stated objectives measurable?	3 (2006)	43	21%	28%	51%
		3 (2010)	119	7%	29%	65%
4	Were the lesson objectives told to the students during the lesson?	4 (2006)	43	28%	23%	49%
		4 (2010)	117	15%	26%	60%
5	In a lesson, did the students find core contens or concept by themselves?	5 (2006)	43	30%	26%	44%
		5 (2010)	113	11%	35%	55%
6	Was there time for evaluating or confirming what the students had learned?	6 (2006)	43	30%	12%	58%
		6 (2010)	118	5%	24%	71%
7	Did most of the students attain lesson objectives?	7 (2006)	43	23%	33%	44%
		7 (2010)	93	5%	32%	62%



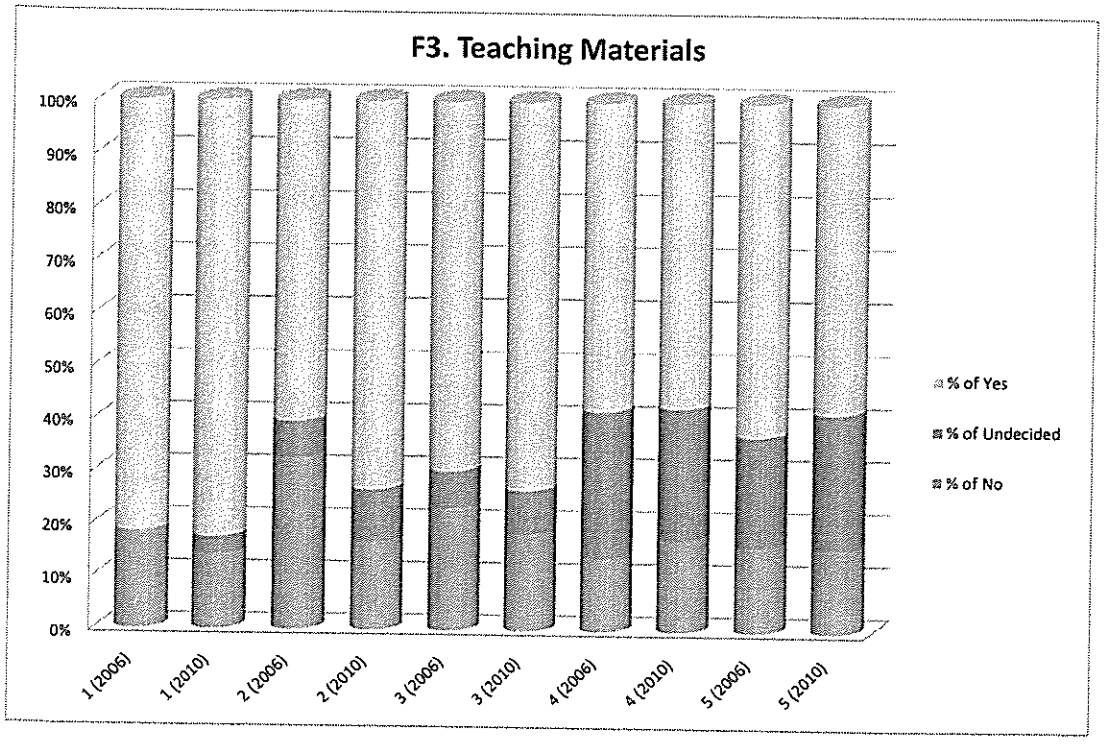
Result of Supplementary Analysis of Lesson Observation (Central Province)
Item by Item Comparison between 2006 (baseline) and 2010 (endline)

F2.	Lesson Progression	Year	N	% of No	% of Undecided	% of Yes
1	Did the introductory part of the lesson motivate students well?	1 (2006)	43	21%	33%	47%
		1 (2010)	119	1%	25%	74%
2	Did the teacher ask the students to hypothesize a solution before instructing them to have an activity or experiment?	2 (2006)	43	42%	21%	37%
		2 (2010)	120	18%	36%	46%
3	There was a presentation by students after an activity.	3 (2006)	43	49%	12%	40%
		3 (2010)	119	32%	13%	55%
4	There was a disscusion among students to find answers or better solutions to the given task	4 (2006)	43	44%	14%	42%
		4 (2010)	120	26%	13%	62%
5	The teacher intended to confirm scientific concept or values in the process of teaching.	5 (2006)	43	21%	26%	53%
		5 (2010)	119	11%	9%	80%
6	Both the teacher and the students were able to conclude what they had learned in a lesson.	6 (2006)	43	26%	26%	49%
		6 (2010)	118	5%	20%	75%



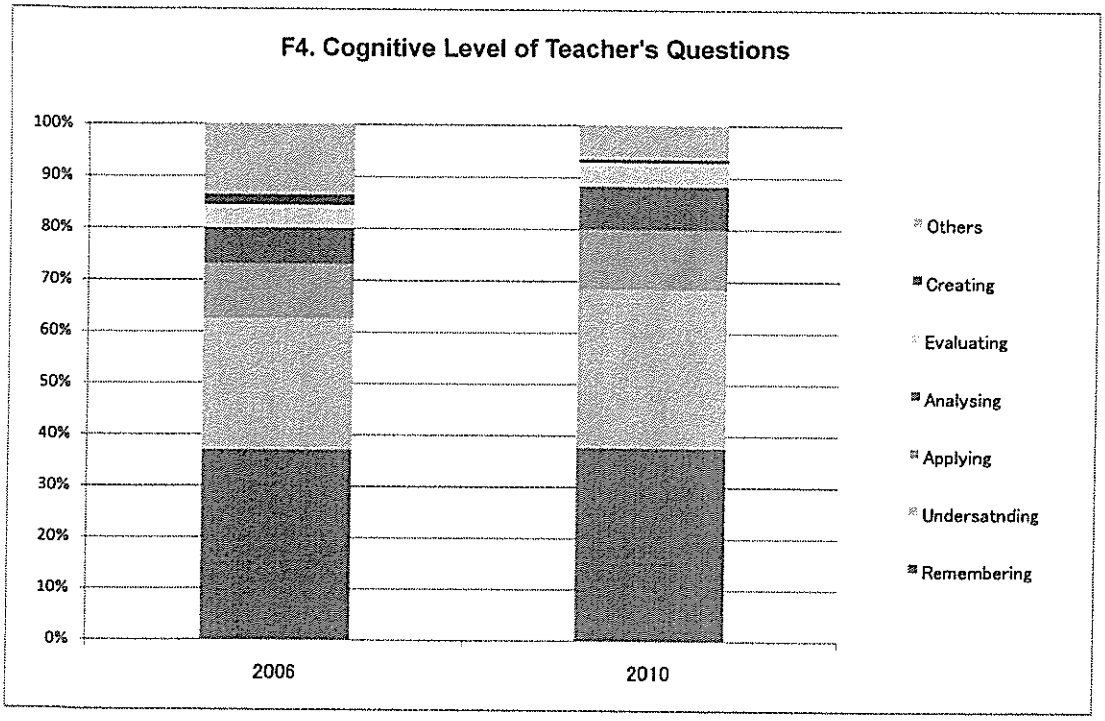
Result of Supplementary Analysis of Lesson Observation (Central Province)
Item by Item Comparison between 2006 (baseline) and 2010 (endline)

F3.	Teaching Materials	Year	N	% of No	% of Undecided	% of Yes
1	Did the teacher use any kind of teaching materials apart from blackboard and chalk?	1 (2006)	43	19%	0%	81%
		1 (2010)	120	14%	3%	83%
2	Teaching materials were prepared properly before the lesson.	2 (2006)	43	33%	7%	60%
		2 (2010)	120	17%	10%	73%
3	The teacher used improvised or locally available teaching materials in a lesson.	3 (2006)	43	23%	7%	70%
		3 (2010)	120	18%	8%	73%
4	The students were able to use or understand the prepared teaching materials.	4 (2006)	43	14%	28%	58%
		4 (2010)	120	18%	25%	58%
5	Teaching materials used in a lesson enhanced students' understandings.	5 (2006)	43	16%	21%	63%
		5 (2010)	120	16%	26%	58%

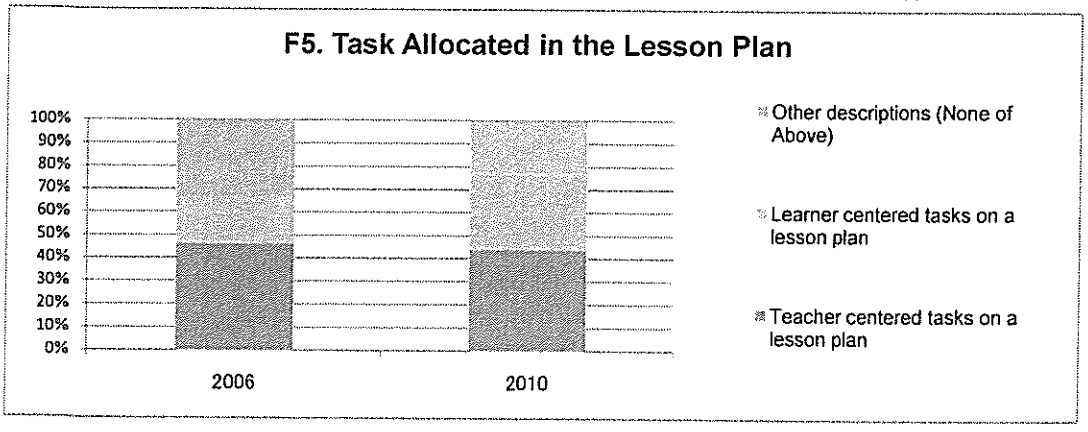


Result of Supplementary Analysis of Lesson Observation (Central Province)
Item by Item Comparison between 2006 (baseline) and 2010 (endline)

F4. Cognitive level of teacher's question	2006 (N=43) %	2010 (N=120) %
Remembering	37.06	37.71
Undersatnding	25.59	30.73
Applying	10.50	11.52
Analysing	6.93	8.39
Evaluating	4.38	4.56
Creating	2.05	0.66
Others	13.49	6.43

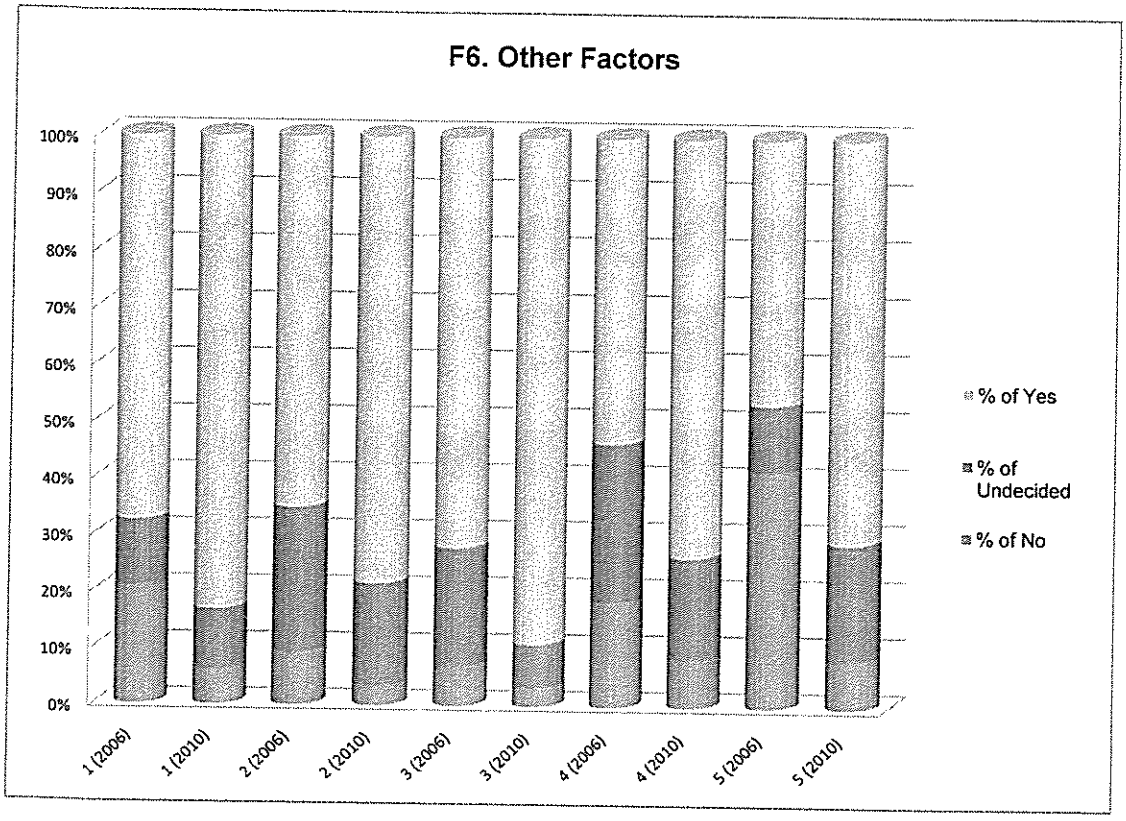


F5. Task Allocated in the Lesson Plan	2006 %	2010 %
Teacher centered tasks on a lesson plan	43.78	43.29
Learner centered tasks on a lesson plan	19.75	55.57
Other descriptions (None of Above)	31.79	0.10
N=	43	98



Result of Supplementary Analysis of Lesson Observation (Central Province)
Item by Item Comparison between 2006 (baseline) and 2010 (endline)

F6.	Other Factors	Year	N	% of No	% of Undecided	% of Yes
1	The teacher managed time well during lesson implementation.	1 (2006)	43	21%	12%	67%
		1 (2010)	113	6%	11%	83%
2	The teacher prepared for the lesson well.	2 (2006)	43	9%	26%	65%
		2 (2010)	116	3%	18%	78%
3	The teacher managed the blackboard very well.	3 (2006)	43	7%	21%	72%
		3 (2010)	118	3%	8%	89%
4	There were no problems in line with laboratory safety in a lesson.	4 (2006)	43	19%	28%	53%
		4 (2010)	117	9%	18%	74%
5	In a lesson, students were guided on taking notes or records well.	5 (2006)	43	42%	12%	47%
		5 (2010)	118	8%	20%	70%



REPUBLIC OF ZAMBIA
MINISTRY OF EDUCATION
CENTRAL PROVINCE

3 September, 2010.

End – line Survey Report of SMASTE – CPD in the Central Province

Prepared By:
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SMASTE SCIENCE SCHOOL BASED CPD PROJECT

INTRODUCTION

Strengthening of Mathematics, Science and Technology Education – School Based Continuing Professional Development (SMASTE-SBCPD) is a technical co-operation project that is run by the Ministry of Education (MoE) in conjunction with Japan International Co-operation Agency (JICA). This programme was implemented in Central Province in 2006; therefore it has been running for four (4) years. (Phase I; Oct.2005-Oct.2007, Phase II; Feb.2008-Feb.2011)

The programme was developed to improve learning activities as well as teaching activities through lesson study by strengthening CPD activities. The SMASTE-SBCPD programme uses the school based SPRINT framework to upgrade the knowledge and skills of the teachers of science, therefore the teachers are the main players in the school based CPD.

The expected outputs of the project were;

- Output 1: Lesson study activities in science are introduced to school at Grades 8-12 in Northwestern Province and Copperbelt Province.
- Output 2: Lesson study is strengthened in Central Province.
- Output 3: Lesson study framework is integrated into Grades 1-7 SBCPD based on the experience on Grades 8-12 of Central Province.
- Output 4: Teaching Skills Book is developed based on the experiences of the three target provinces.
- Output 5: Management skills book on SBCPD for school managers is developed based on the experiences of the three target provinces.
- Output 6: Monitoring of SBCPD is improved in the target provinces.

As Central Province, the related outputs are Output 2, Output 3, Output4, Output5, and Output6.

In order to assess the effectiveness of the project, a baseline survey was done by the Technical committee for the project from January to June 2006 to obtain data on the teachers and pupils in the province. The baseline survey comprised of two parts namely;

- Teacher skills on conducting science lessons assessed by the observation of lessons.
- Pupils' perception on their science lessons assessed by administering questionnaires to pupils.

As the project phase II came to an end in February 2011, an end line survey was conducted to collect data for final evaluation of the programme.

PURPOSE OF THE RESEARCH

The purpose of the survey was;

- To conduct a similar survey as the baseline survey.
- To find out if there is any improvement in teaching and learning in the classroom by comparing the result of the baseline 2006 survey and the end line 2010 survey.

INSTRUMENT AND PROCEDURE

INSTRUMENTS
The end line survey was carried out by the use of SBCPD Monitoring and Evaluation instruments. There were basically four (4) types of instruments and these were;

I. Lesson Assessment Format (Technical Monitoring): This form was filled in by the observers who were observing the science lessons conducted by teachers in high and basic schools. This instrument had six (6) parts and these were;

   a. Objectives and its attainment
   b. Lesson progression
   c. Teaching materials
   d. Questioning
   e. Task allocation in the lesson plan
   f. Other factors- which includes time management, lesson preparation, blackboard, laboratory safety and guiding note taking

   This tool was used in all the schools that were sampled in the six (6) districts of central province.

II. Questionnaire for Pupils on the Perception of the Lesson: This questionnaire was administered to the pupils both in high and upper basic school. This tool asked pupils about sixty (60) questions on how they thought and felt about their science class.

III. Questionnaire on the Implementation of SBCPD (For Teachers): This questionnaire was given to the teachers at the schools that were sampled in the 2006 baseline survey to know their impressions and thoughts on the Context, Input, Product and Product (CIPP).

IV. Questionnaire on the Implementation of SBCPD (For School Managers): This tool was given to be answered by the school managers, Head or Deputy Head Teachers.

PROCEDURE

The schools that were used in the baseline survey of 2006 were the ones that were used in the end line survey of 2010. This was to enable a comparison between the baseline survey in 2006 and end line survey in 2010.

WHO OBSERVED THE BASELINE AND ENDLINE SURVEY

The observation of the baseline was conducted (observed) by the PEST – (Provincial Education Support Team.) In 2010 the Endline survey was only monitored by the DEST – (District Education Support Team.) and PEST received the data from districts.

SAMPLING OF LESSON ASSESSMENT

The lessons which were observed by facilitators on baseline survey and end line survey are following;

District	Schools	No. of teachers	
		2008	2010
Mkushi	Chalata High	16	20
	Chalata Basic		
	Mkushi High		
	Changilo		
	Munsakamba Basic		
	Chibefwe		
	Nankolongo Basic		
	Farm Block		
	Mkushi Boma		
	Mkushi Boma		
Kapiri Mposhi	Lukanda Basic	12	20
	St Puals High		
	Chibwe Basic		
	Mpunde High		
	Palamedes Basic		
	Mulonga Basic		
	Mkonchi High		
	Lukomba Basic		
	Kapiri Basic		
	Matilyo Basic		
	Hilltop Basic		
	Lukanda Basic		
	Mpunde High		
Chibombo	Moomba High	19	20
	Golden valley Basic		
	Chisamba Basic		
	Kampekete Basic		
	Chipembi High		
	Chisamba Basic		
	Chibombo High		
	Liteta Basic		

	Nachiyaba Basic		
	Chibombo Basic		
	Moomba Basic		
	Chipembi Basic		
	Chibombo High		
	Mwayansuka Basic		
Mumbwa	Bulungu Basic	8	21
	Sanje High		
	Mumbwa High		
	Sanje Basic		
	Nampundwe High		
	Nampundwe Basic		
	Kalilwe Basic		
	Bulungu basic		
	Bulungu Basic		
Serenje	Mkando Basic	12	20
	Mupepetwe High		
	Mupepetwe Basic		
	Chibale Basic		
	Nchmishi Basic		
	Serenje High		
	Ibolelo High		
	Serenje Basic		
	Kamwala Basic		
	Ndabala Basic		
	Mulilima Basic		
	Chibobo Basic		
	Chimupati Basic		
	Kofi Kunda Basic		
	Mkando High		
Kabwe	Caritas High	8	19
	Broadway Basic		
	Mwashi Basic		
	Stephen Iwisha High		
	Katondo Basic		
	Mine Basic		
	Jasmine High		
	Nkwashi Basic		
	Buseko Basic		
	Ngungu Basic		
	Angelina Tembo High		
	Bwacha High		
	Kabwe High		
	Rapheal Kombe High		
	Sacred Heart Basic		
	Naambe Basic		

SAMPLING OF SCHOOLS

The schools, where the questionnaires were conducted on end line survey are following;

High Schools covered in the research

District	No. Pupil's Involved	No. of Teachers Involved	No. of Schools
Kabwe	45	21	9
Serenje	48	20	6
Chibombo	99	20	8
Mkushi	67	20	9
Kapiri Mposhi	64	19	7
Mumbwa		7	13
Total	**323**	**107**	**52**

Basic Schools covered in the research

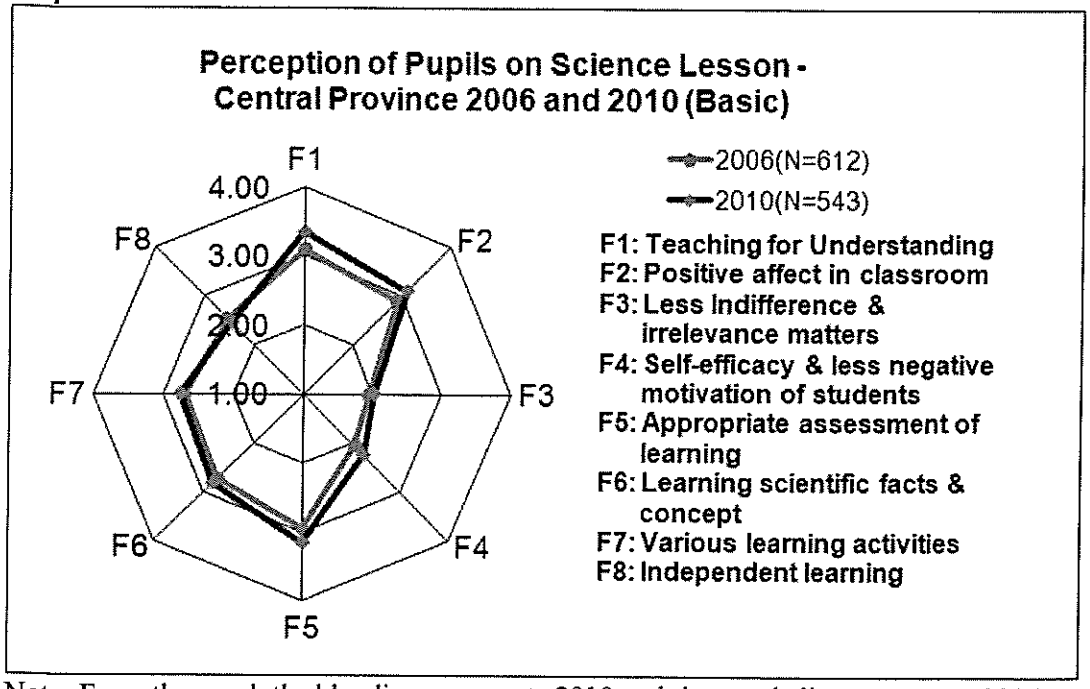
District	No. Pupil's Involved	No. of Teachers Involved	No. of Schools
Kabwe	109	13	10
Serenje	108	14	14
Chibombo	49	11	12
Mkushi	75	13	13
Kapiri Mposhi	83	10	7
Mumbwa	146	8	8
Total	**570**	**69**	**64**

ANALYSIS OF RESULTS

1. PERCEPTION OF PUPILS ON SCIENCE LESSON

The results of this project were analyzed from the data collected from the schools. The general view of the data is shown in the graph below displaying the impact of the project in the central province for all the basic schools through the questionnaires answered by the pupils.

Graph 1

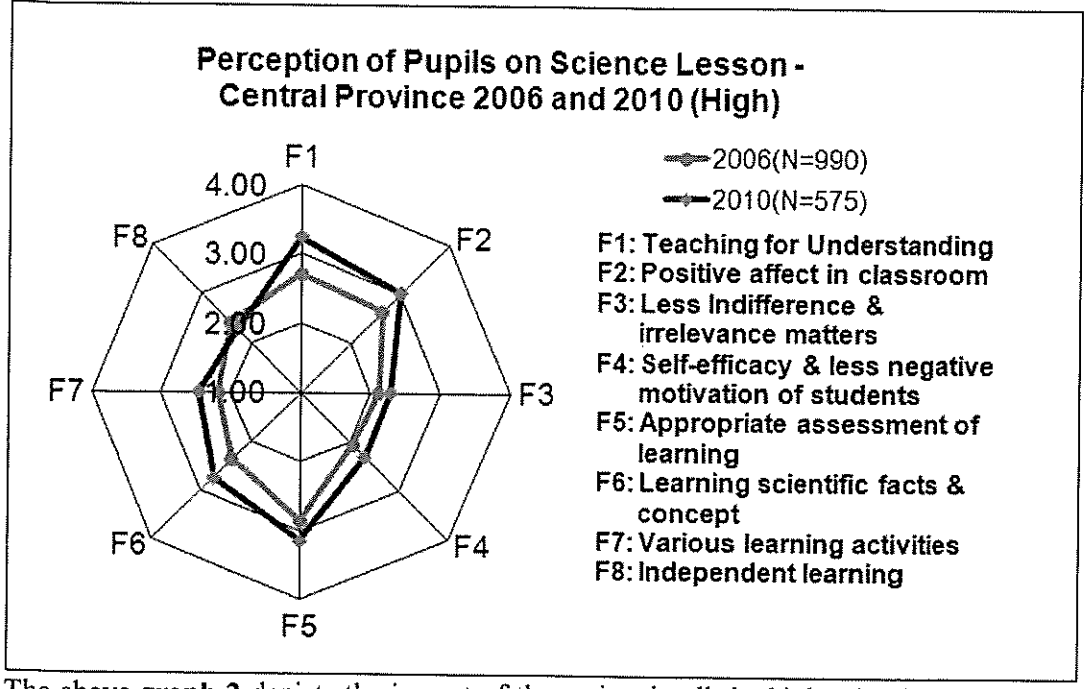


Note: From the graph the blue line represents 2010 and the purple line represents 2006.

From the analysis of this graph it shows us that since 2006 the project has impacted the schools in following:

1. **Factor 1**: Teaching for understanding, **Factor 4:** Self-efficacy & less negative motivation of students, **Factor 5:** Appropriate assessment of learning have improved but slightly as compared to 2006 representation.
2. But for **Factor 7 and 8** there is no change or impact has been noted.
3. This is interpreted as the project is a success in that the response good from the teachers and pupils.

Graph 2



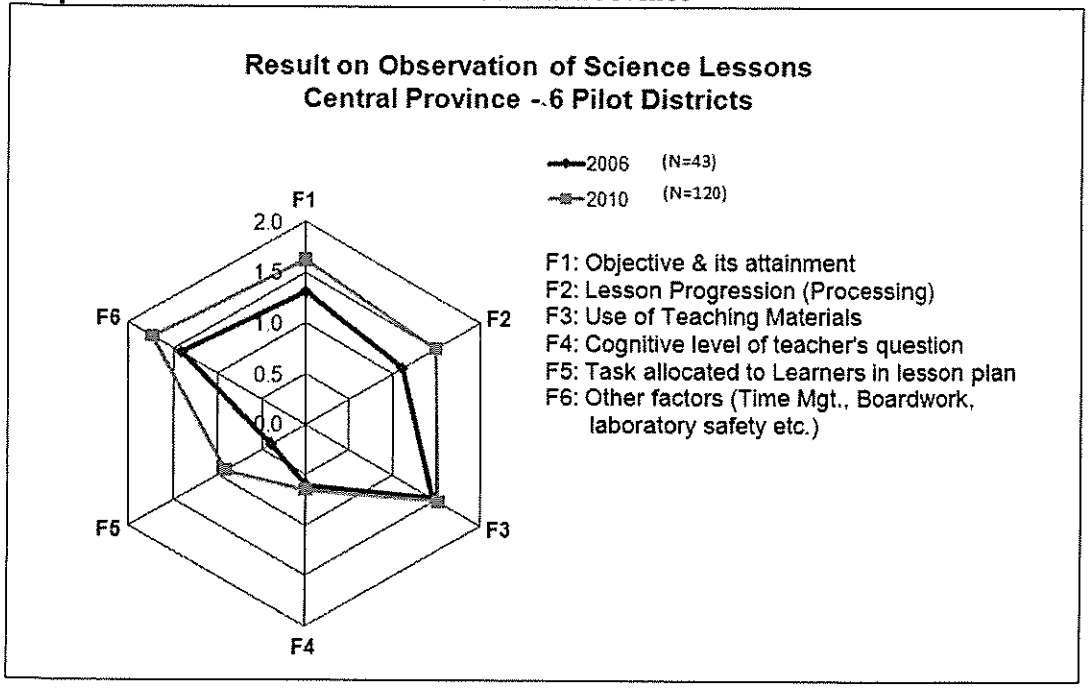
The above **graph 2** depicts the impact of the project in all the high schools pupils in the central province.

From the graph the following has been observed that through out the project has had great impact in all the high schools except for **Factor 8** which has not improved but has even gone below than the initial.

2. OBSERVATION OF SCIENCE LESSONS.

The **Graph 3** below (Result of observation of science lessons) indicates that there is an improvement in the teaching and learning activities. There is great improvement in Factor 5 which means that the tasks that are allocated in the lesson plans are both teacher centered and student centered.

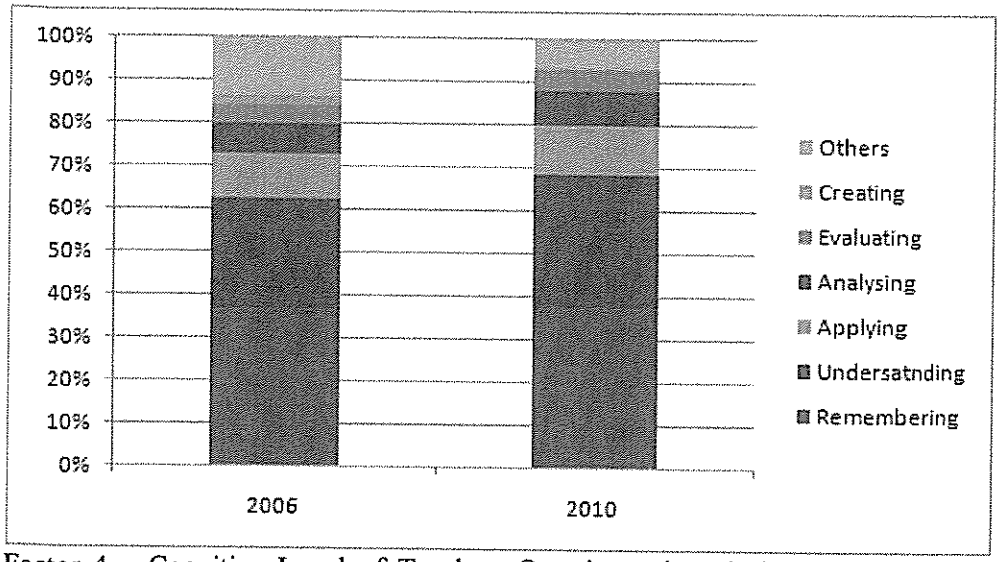
Graph 3 Observations of Lessons in Central Province



Factor 1 – Objective and Attainment: has also shown improvement which indicates that there is an improvement in the teachers' lesson plan. This means that objectives are clearly stated making it easy for the pupils to find core contents or concepts by themselves thus attaining the objectives.
The factor 1 has improved in attaining the objectives started in 2006 was 65% while the new graph shows that 2010 has 85% therefore the improvement is 23% in comparison to 2006.

Factor 2 – Lesson Progression: has also improved compared to the initial in 2006 which means that the project has helped the teachers in their lesson progression. In their lesson progression the teachers are able to motivate the pupils with the introduction of the lesson, students are able to conduct a presentation after a lesson and the teachers as well as the pupils are able to what they learn in the lesson. The improvement is from 47% of 2006 to 74% in 2010 giving an improvement of 24%. Also the conclusion of the lesson by teachers and pupils has increased from 49% in 2006 to 75% in 2010. For the project it means, the lesson progression (factor 2) has improved by 26%.

Factor 3 – Teaching Materials: Looking at this factor graphs shows that there is a slight improvement, meaning it is fairly poor. For instance, in 2006 the teaching material was at 81% which in 2010 is 83%, which means that the improvement is only 3% however, it can be said that the preparation of the teaching materials before the lessons is fairly good as it has improved from 63% in 2006 to 75% in 2010.



Factor 4 – Cognitive Level of Teachers Questions: there is basically no improvement despite the implementation of the program. However, the level of understanding of the questions by the pupils has improved from 25.59% to 30.73% which means an increment of 5.14%.

Factor 5 – Tasks Allocated to Learners in Lesson Plan: The general perception of the factor is that there is great improvement in 2006 the bar chart reads. It reads that there is much work centered on the pupils' involvement in the lesson plans. More of taking pupils to answer or do experiments on their own and finding results.

Factor 6 – Other Factors: With the program in play, the teachers are able to manage time well during lessons, prepare there lessons well, utilize the blackboard well, give attention to the safety of the environment in the laboratory, as well as guide the pupils in their note taking.

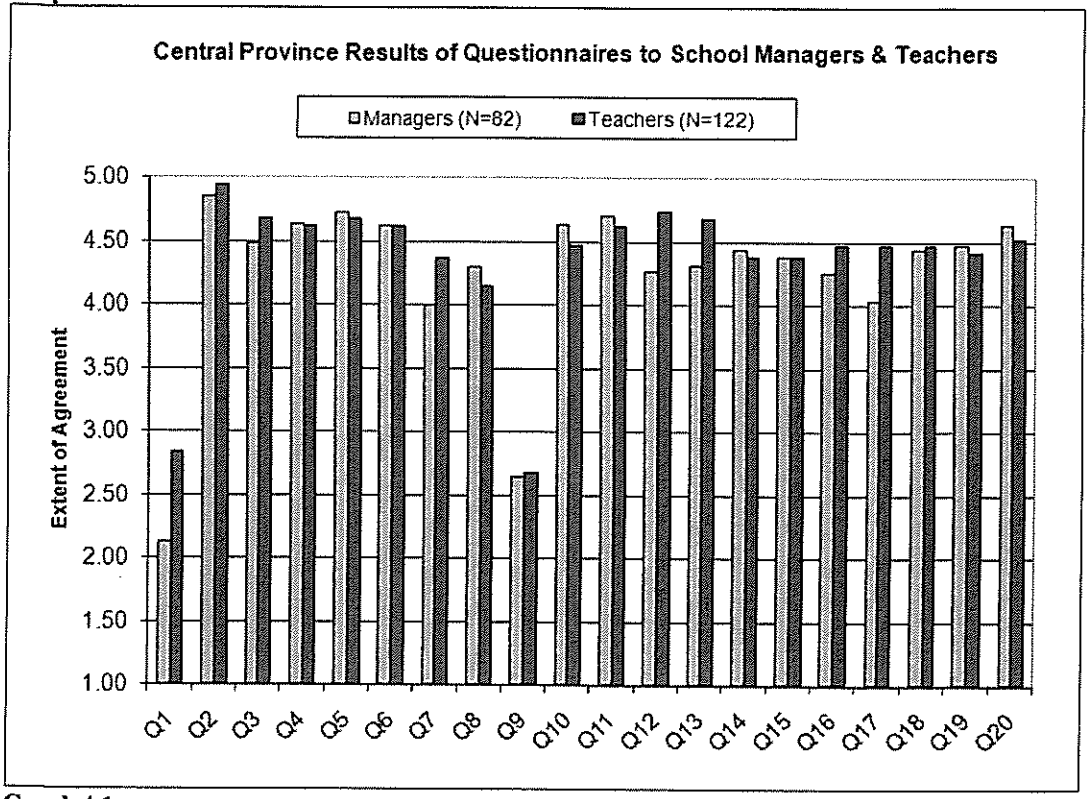
3. TEACHERS AND MANAGERS

The graph 4 below shows data in the questionnaires answered by the teachers and managers in the school. The questionnaires targeted the following:

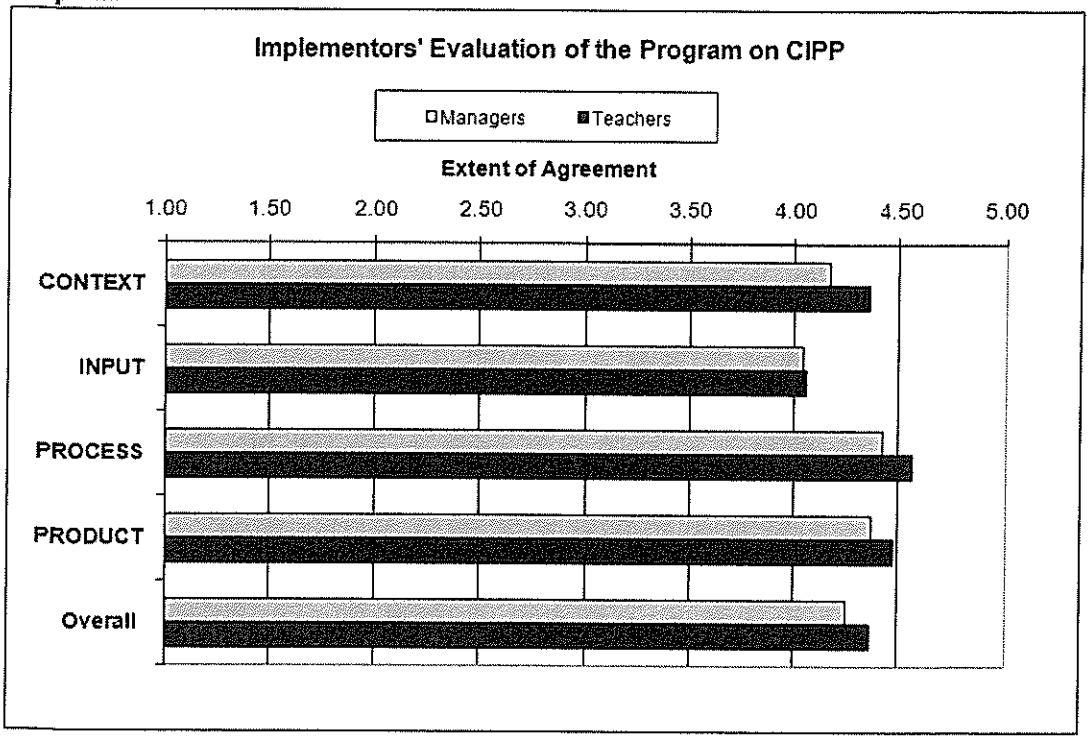
1. Context
2. Input
3. Process
4. Product

The questionnaire contained 20 questions all together.

Graph 4



Graph 4.1



The **Graph 4** and **4.1** on the above shows that from the managers and teachers believe that the project is a good success because they agree to the fact that the project is achieving its purpose.

REPORTS FROM DISTRICTS

CHIBOMBO DISTRICT

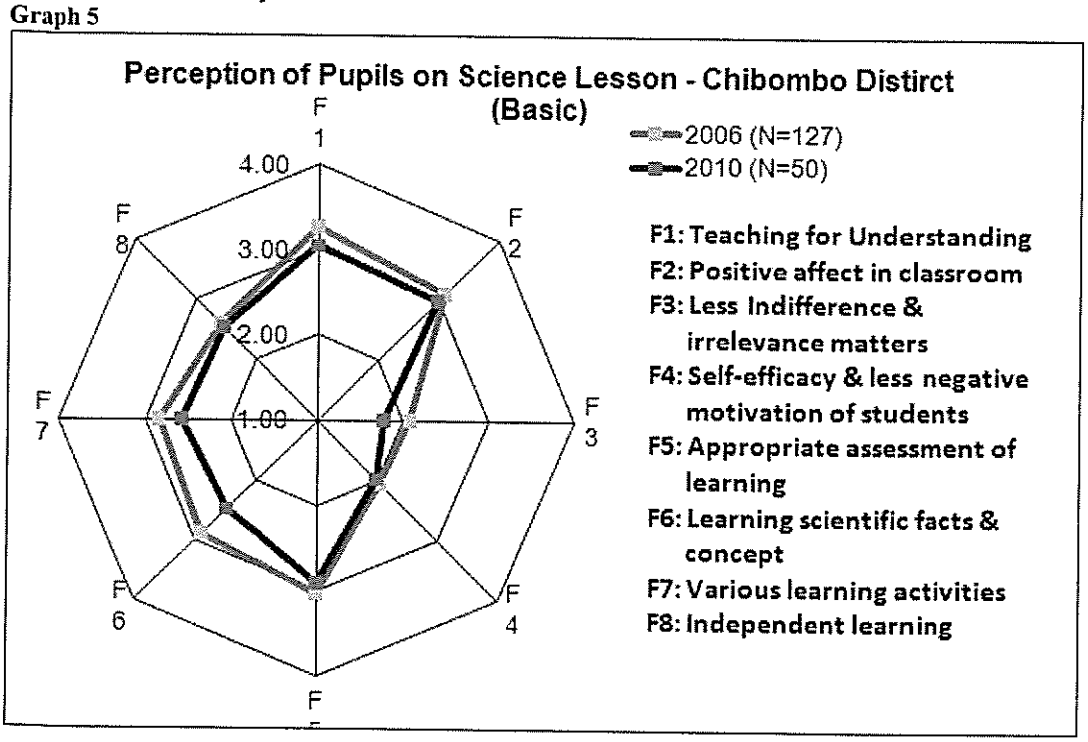
1. PERCEPTION OF PUPILS

Basic schools

The result from **Graph 5** shows that there is no impact by the program in the basic schools of Chibombo.

As a matter of fact the results show that the graph for 2010 results have gone below the initial baseline survey 2006

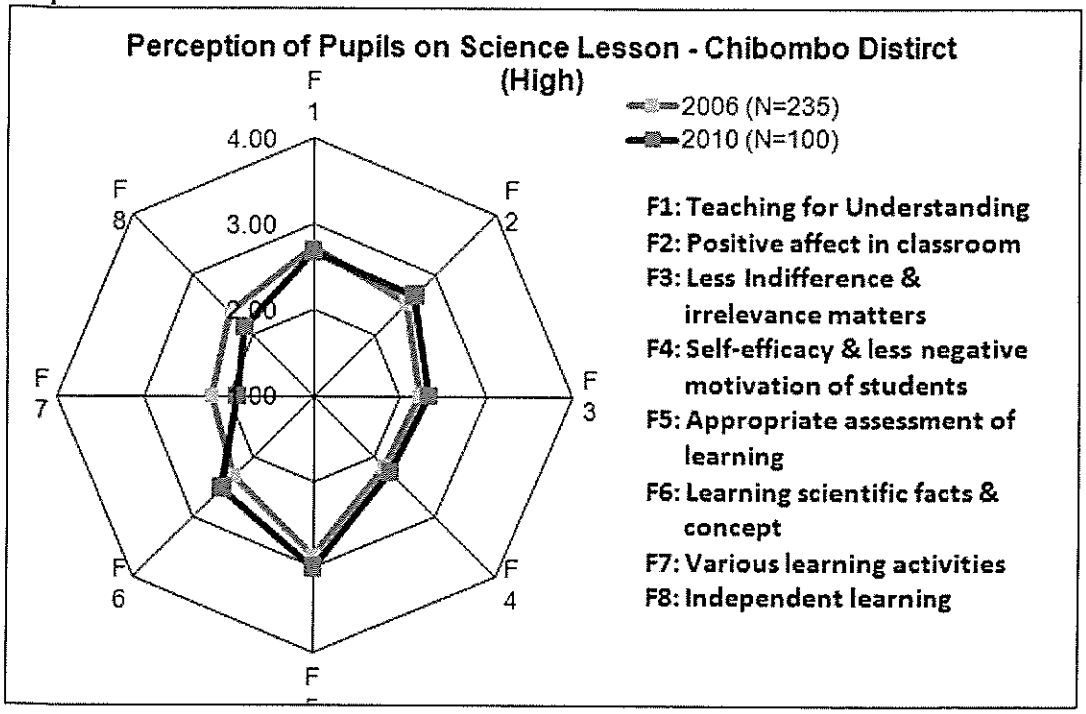
Graph 5



High Schools

In the graph below (graph 6) there is slightly an improvement in factors 1- teaching for understanding, 2 – positive affect in classroom,3 – less indifference & irrelevance matters,4 – self- efficacy & less negative,5- appropriate assessment of learning but, factors 6 and 7 the graph shifts downwards, meaning there is a negative impact only on these factors.

Graph 6

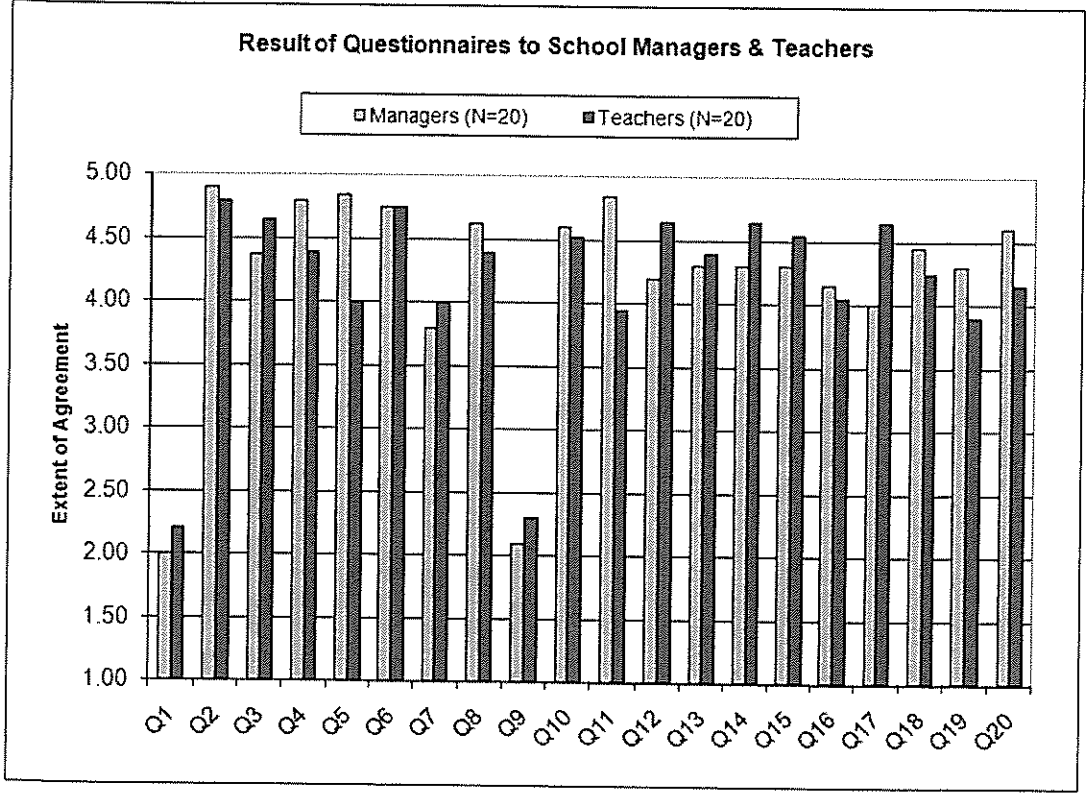


2. TEACHERS AND MANAGERS

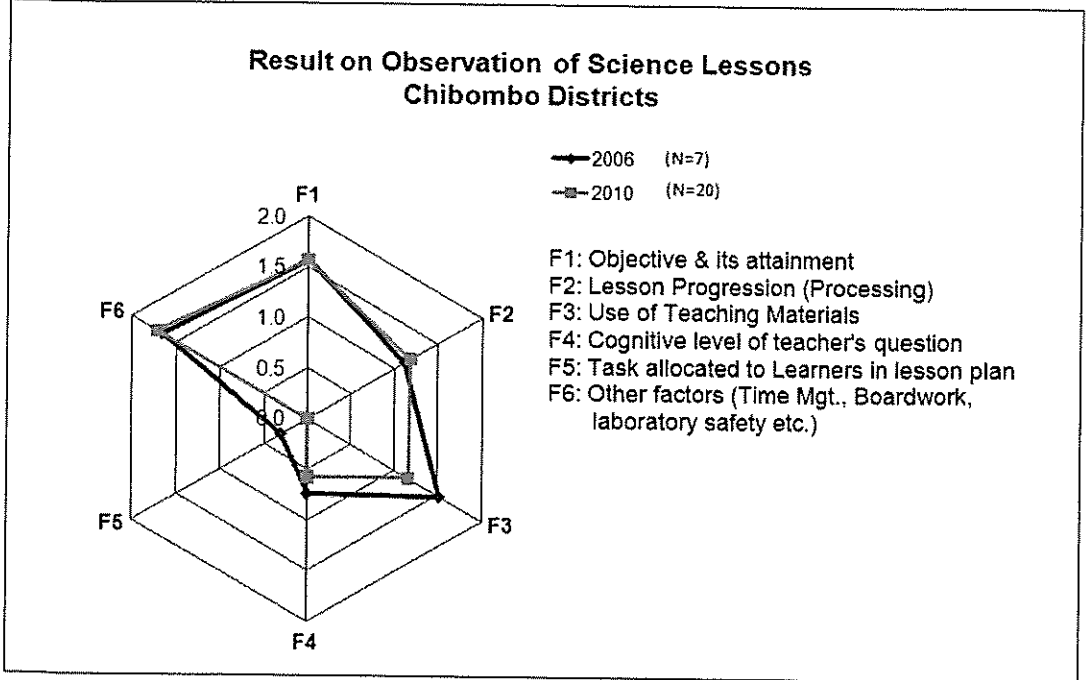
According to the chart, the managers think that there is an improvement in the learning and teaching of teachers of science. That is in the Context, Input, Process, Product and overall in the implementation of the program.

Teachers generally think there is also an improvement in their teaching and learning activities and thus can be seen through the extent of agreement being above the 2.0.

Graph 7



Graph 8



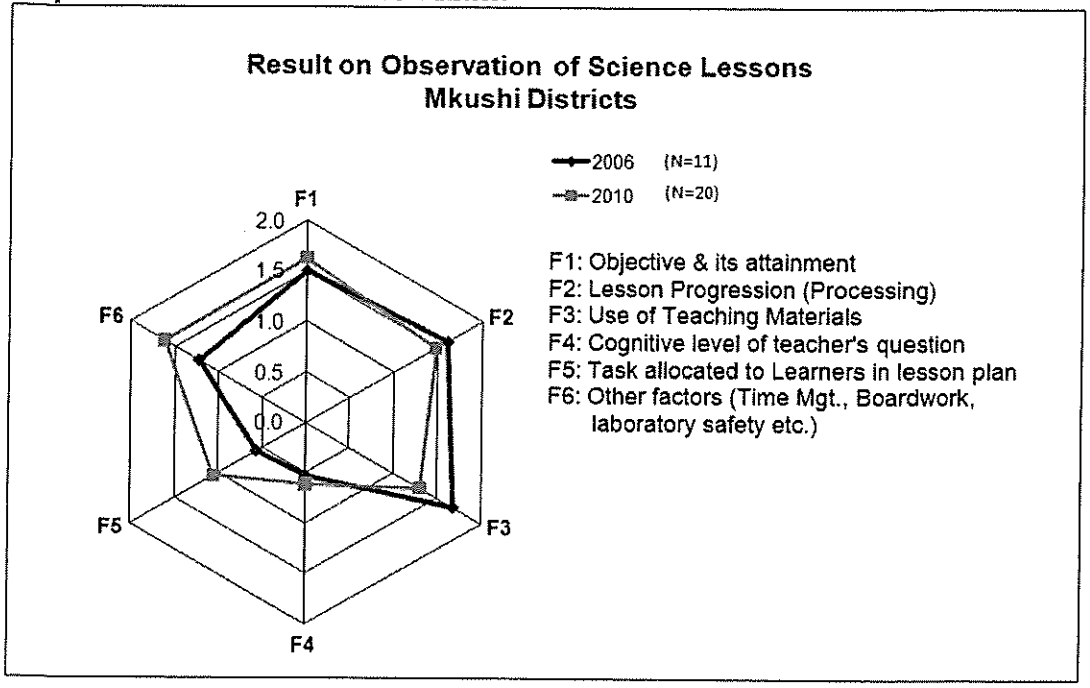
The above graph shows the results from the observation which was done by the observers. As the graph depicts, the factors lined up in the lesson plan are not being achieved and this can be seen in the graph, there is decrease in application of the factors lined out in the C.P.D Program.

MKUSHI DISTRICT

1. OBSERVATION OF LESSONS

The graph shows that the SBCPD program has an impact on the teachers in the learning and teaching of science, it can be seen from the graph that factors 1, 6, 5, and 4 have improved in that the line shifts outwards. However factors 2 and 3 shows an improvement but, a decrease in the line. This means that teachers in Mkushi district are using less teaching materials than they were using in 2006 but lesson progression (application) is fair.

Graph 9 observation of lessons Mkushi district



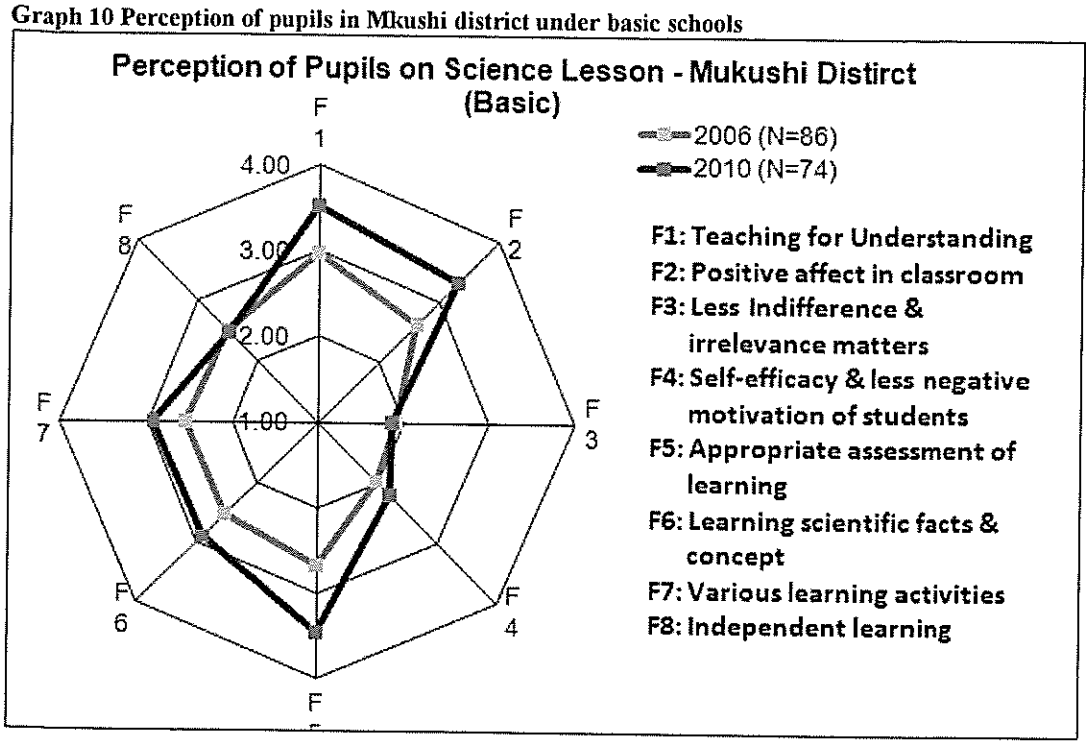
Graph 9 depicts the lesson observation for Mkushi district of the central province.

2. PERCEPTION OF PUPILS

Basic Schools

The pupils in the basic schools in Mkushi district generally think the program has helped to improve the teaching of the teachers of science and this is indicated by **Graph 10**. However, factors 3 and 8 have slightly shifted downwards.

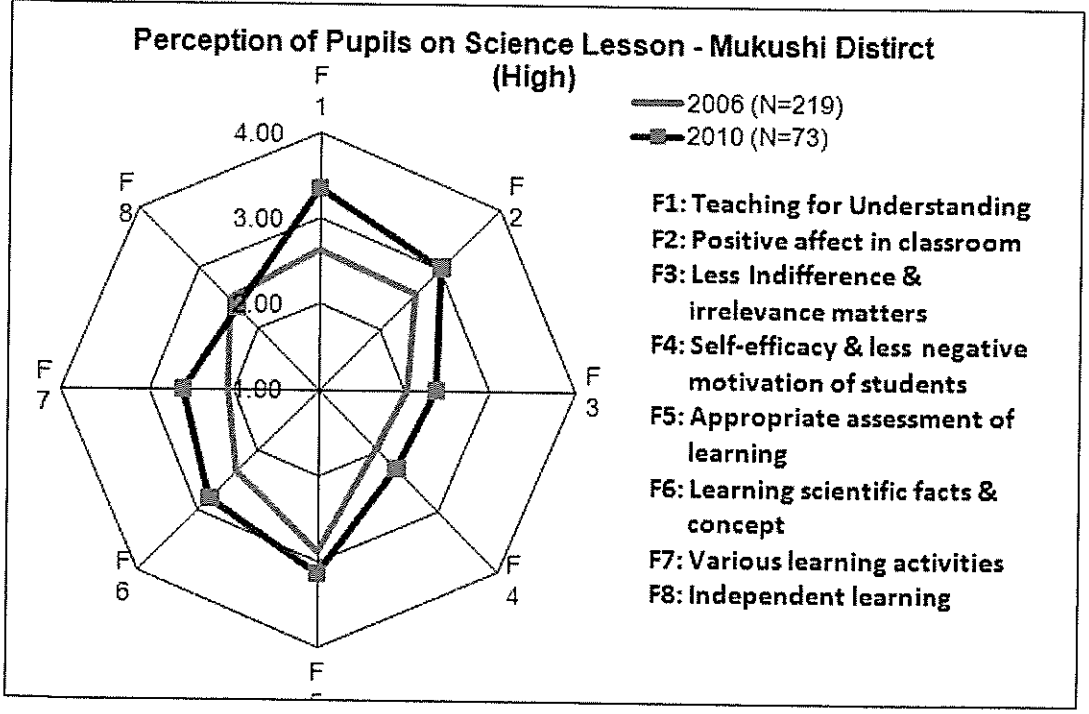
Graph 10 Perception of pupils in Mkushi district under basic schools



High Schools

Graph 11 indicates that there is a great improvement apart from factor 8 which seems to have shifted downwards indicating that there is basically no improvement from 2006.

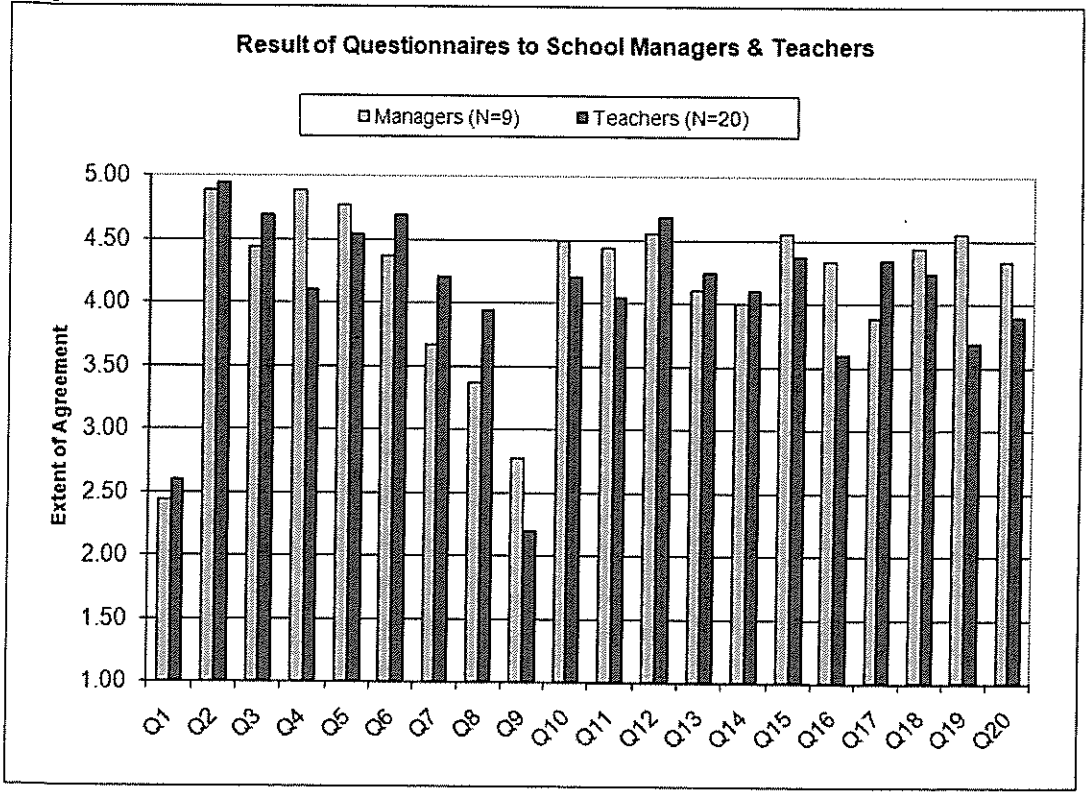
Graph 11



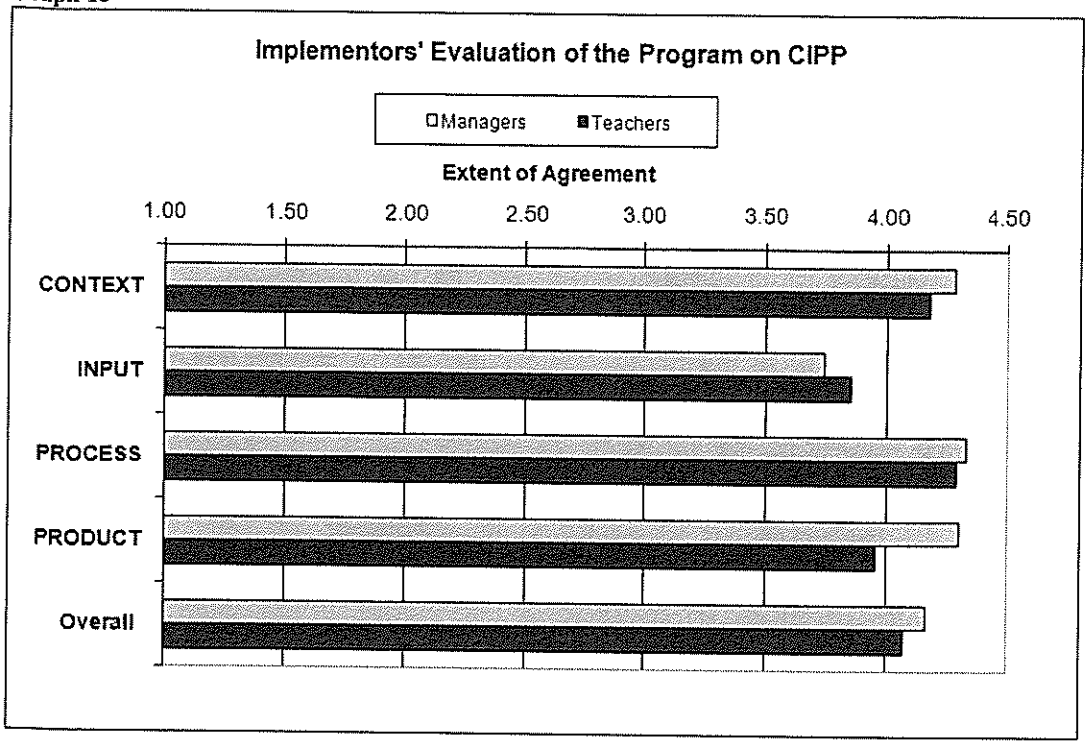
3. TEACHERS AND MANAGERS

The extent of agreement from both the managers and teachers is above 2.0 thus, there is an improvement, with the implementation of SBCPD program and this can be seen from the Teachers and Managers graph

Graph 12



Graph 13



SERENJE DISTRICT

1. PERCEPTION OF PUPILS

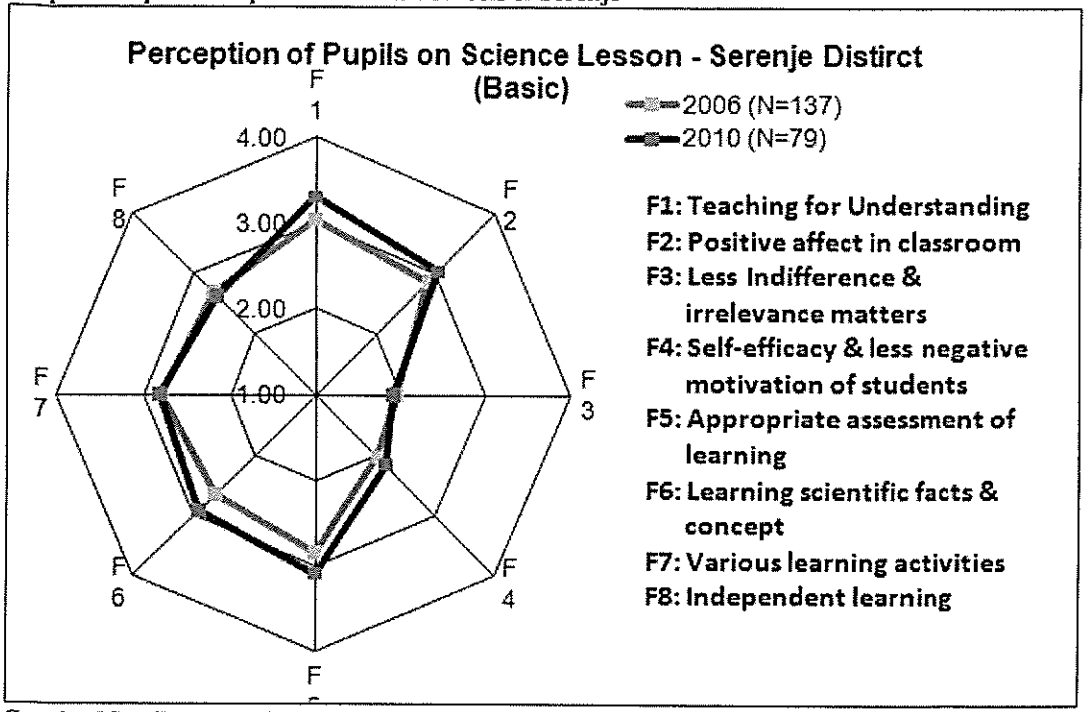
Basic Schools

According to **Graph 14,** the basic schools graph has slightly shifted outwards, thus,an improvement in the line or graph of 2010 running parallel to 2006 however factors 3, 7 and 8 remain constant at the same values as the 2006.

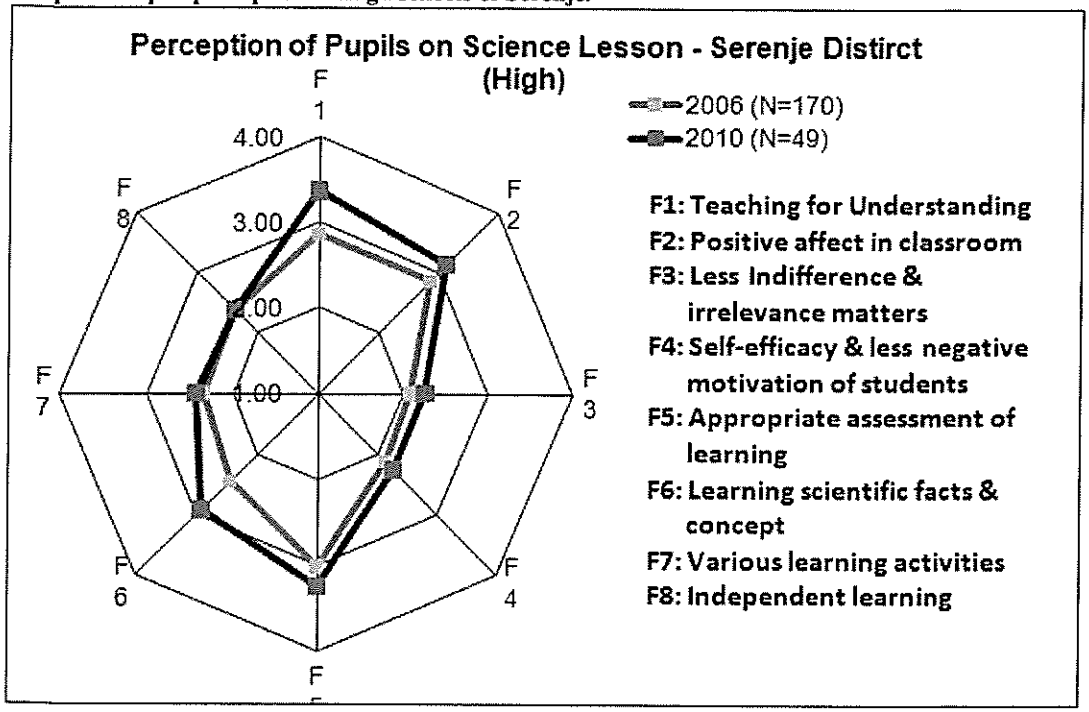
High Schools

Like the basic schools, **Graph 15** for high schools also indicates a slight outward positive improvement though factor 8 is constant.

Graph 14 Pupils Perception in all Basic schools of Serenje



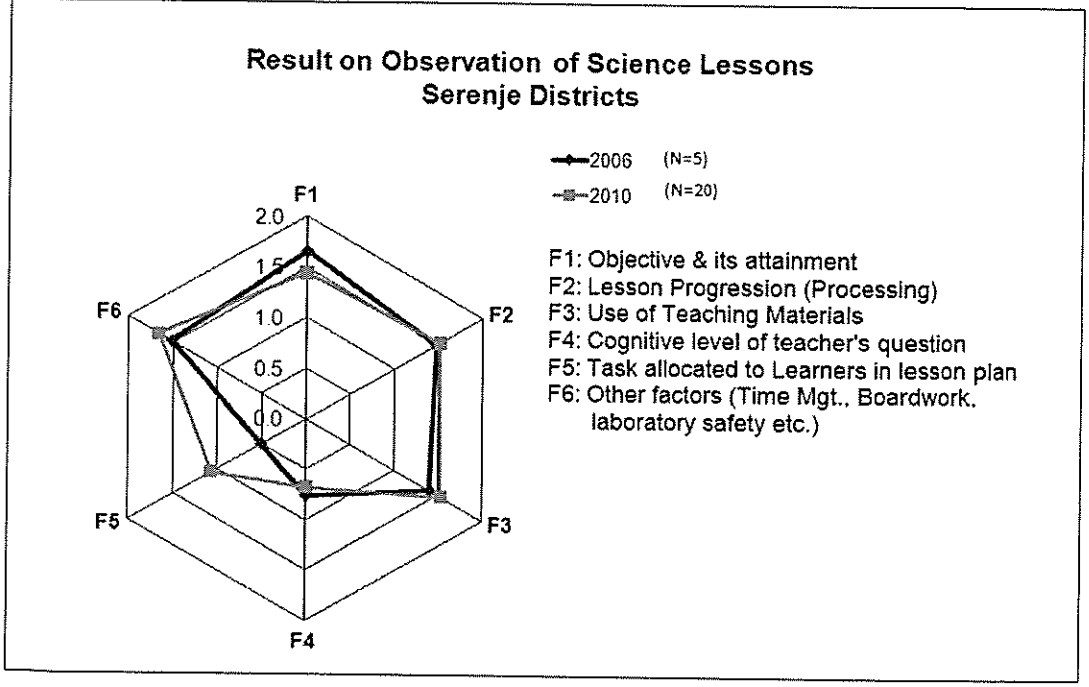
Graph 15 Pupils perception in High schools of Serenje.



2. OBSERVATION OF LESSONS

From the **Graph 16** it can be seen that there is a slight improvement in the lessons of the teachers of the science. Whilst it also indicates that the objectives and attainment are not indicated by teachers in there lesson study and the questioning of the teachers to find out if the pupils understand what is being taught is fairly poor.

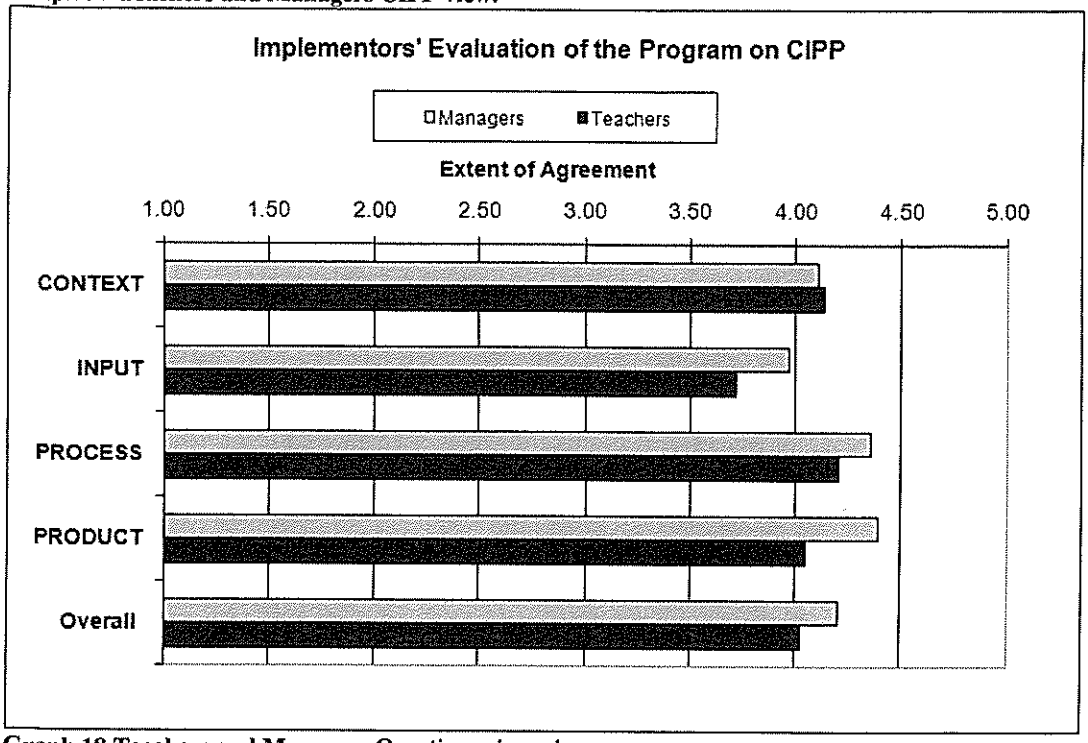
Graph 16 Observation of lessons



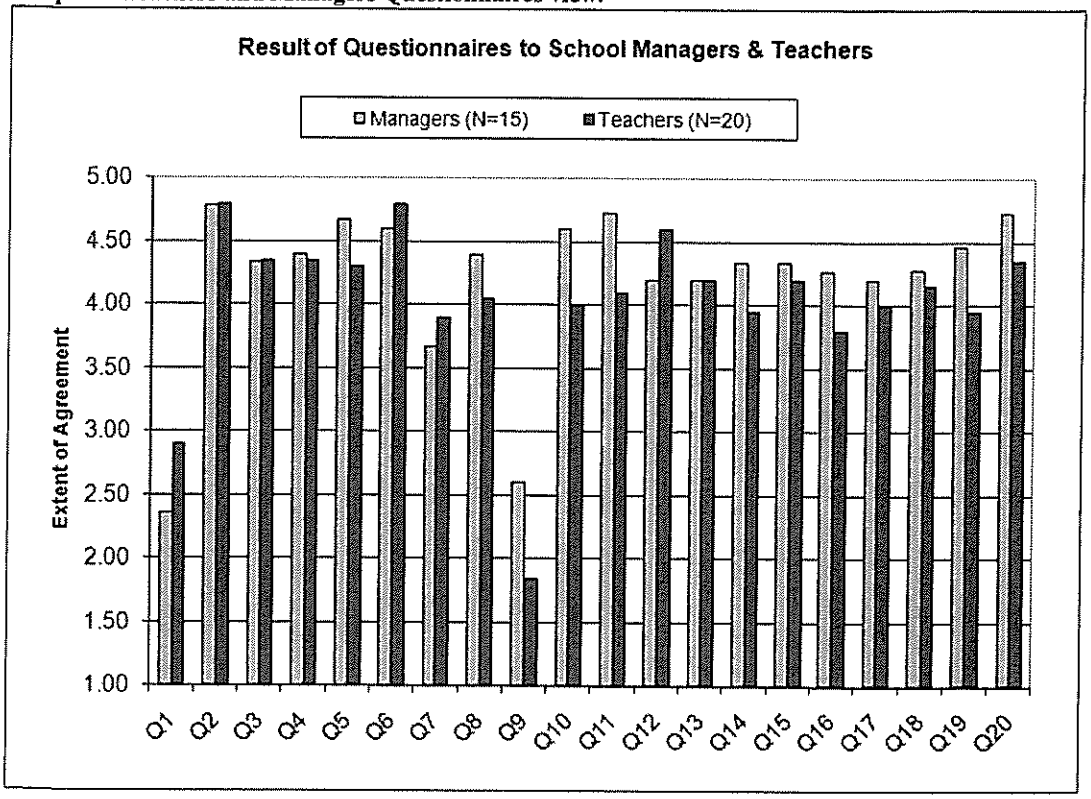
3. TEACHERS AND MANAGERS

From the **Graph 17** it can be seen that teachers and manager's extent of agreement for Context is above 3.5, Input is above 3, Process is above 3.5 and Product is above 3. This means that with the implementation of the program (SBCPD) there is great improvement in the teaching and learning activities.

Graph 17 Teachers and Managers CIPP view.



Graph 18 Teachers and Managers Questionnaires view.



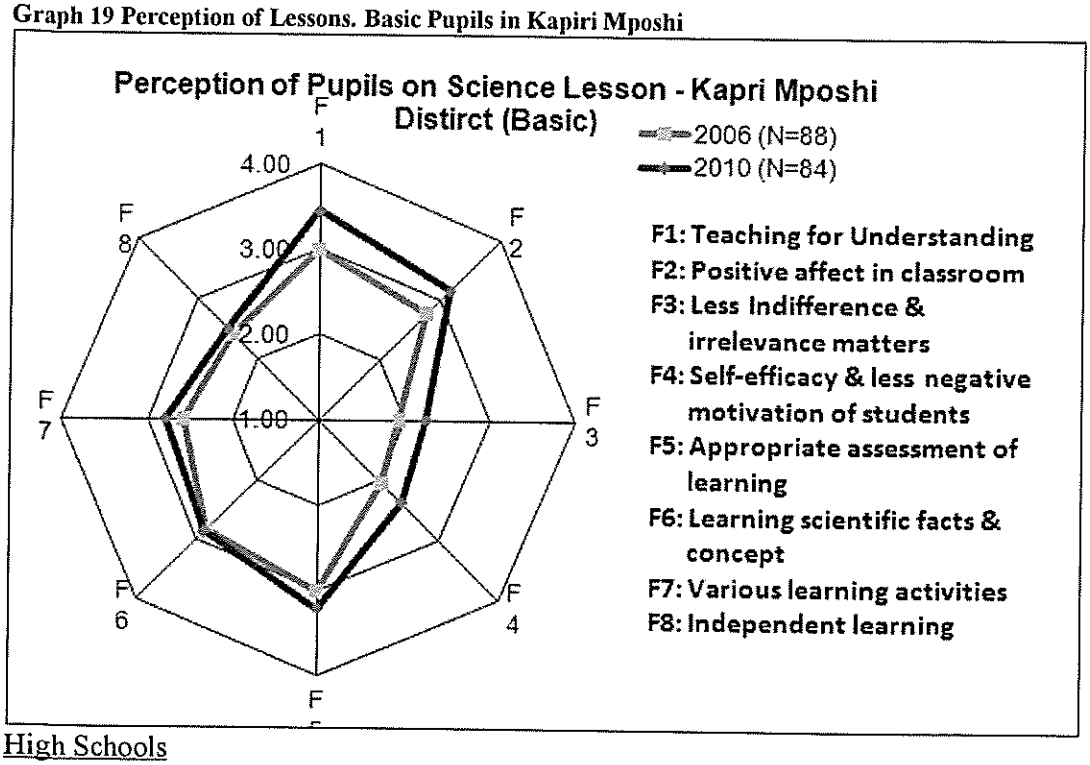
KAPIRI MPOSHI

1. PERCEPTION OF PUPILS

Basic Schools

The graph indicates that there is an improvement slightly above the initial, thus the difference can be noted.

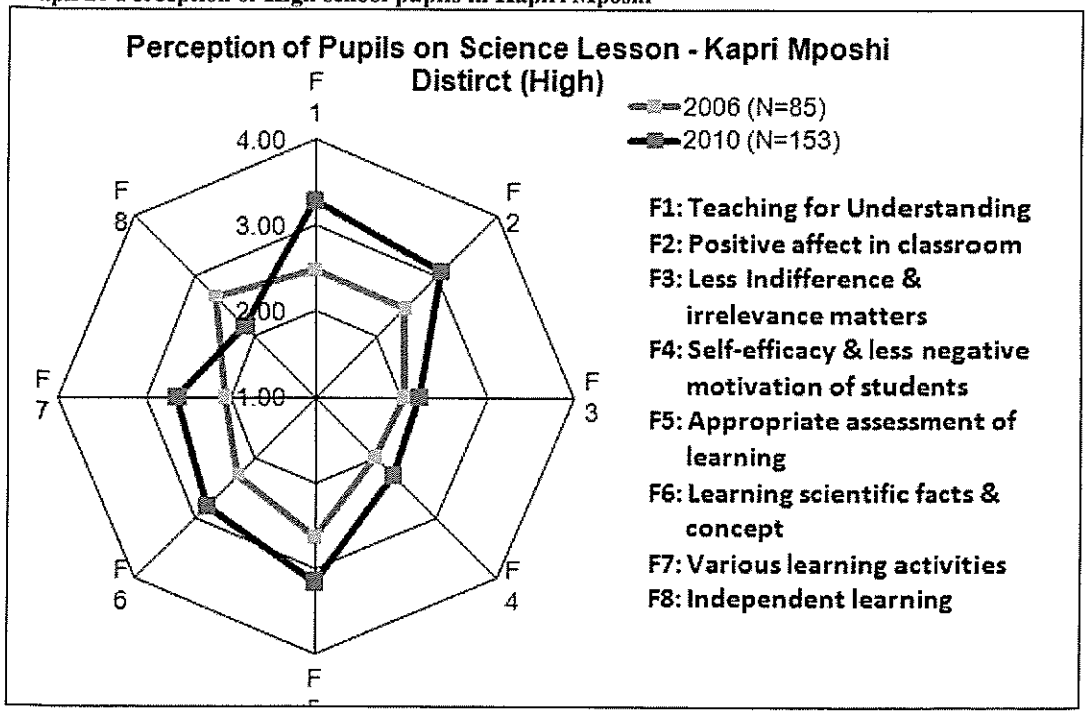
Graph 19 Perception of Lessons. Basic Pupils in Kapiri Mposhi



High Schools

The graph above indicates that teaching in high schools from the perception of pupils is very high as compared to that of basic schools.
Despite the perception being good, there is a downwards shift in the graph for factor 8.

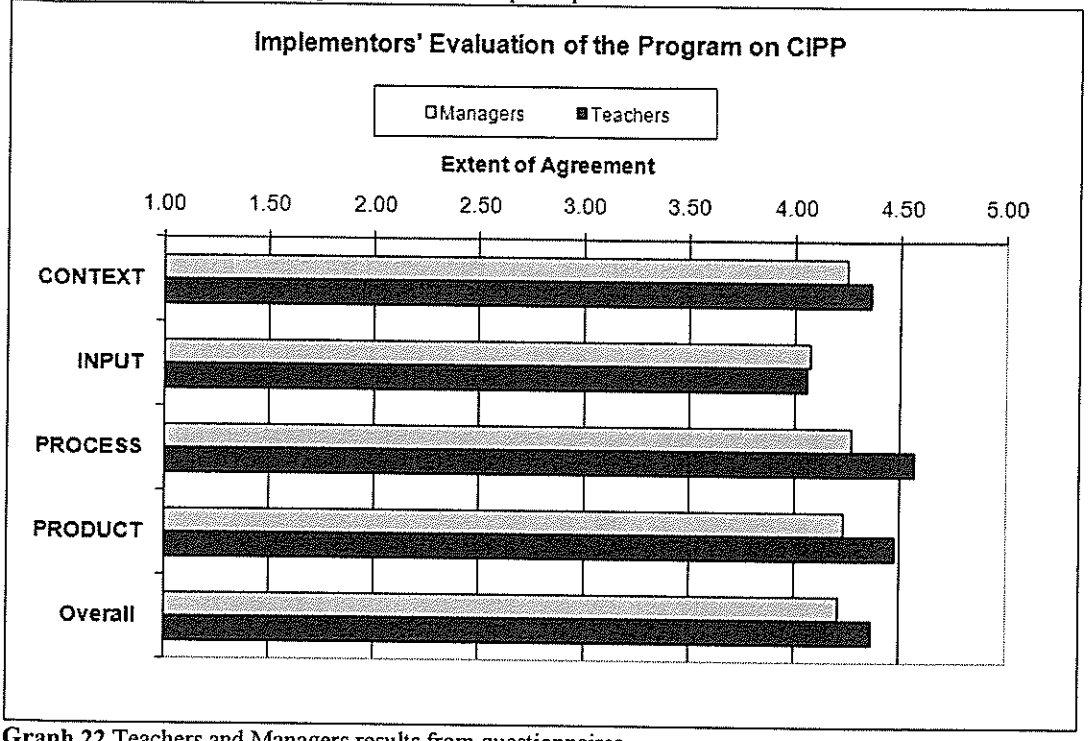
Graph 20 Perception of High school pupils in Kapiri Mposhi



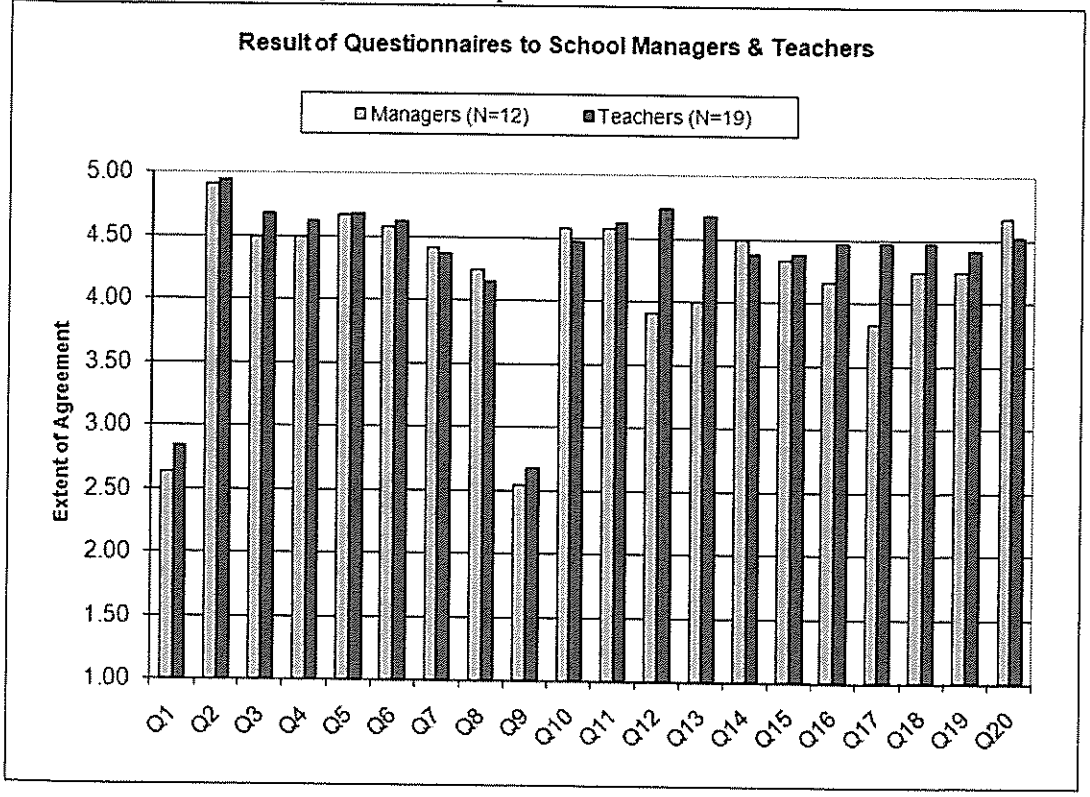
2. TEACHERS AND MANAGERS

From **Graphs 21 and 22** it can be seen that teachers and manager's extent of agreement for Context is above 3.5, Input is above 3, Process is above 3.5 and Product is above 3. This means that with the implementation of the program (SBCPD) there is great improvement in the teaching and learning activities. As an overall view from the CIPP chart the teachers are in more agreement to the effect of the project.

Graph 21 Teachers and Managers in CIPP for Kapiri Mposhi

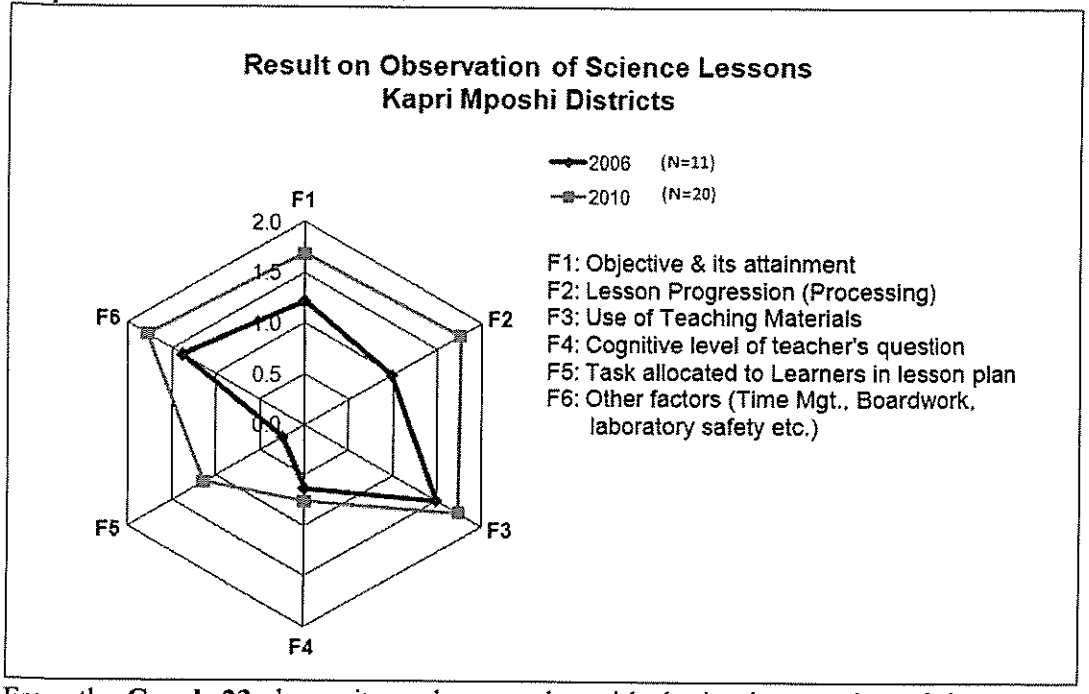


Graph 22 Teachers and Managers results from questionnaires.



3. OBSERVATION OF LESSON

Graph 23 Observation for science lesson



From the **Graph 23** above, it can be seen that with the implementation of the SBCPD programme in the district there has been a tremendous change in the teaching and learning activities of science lessons.

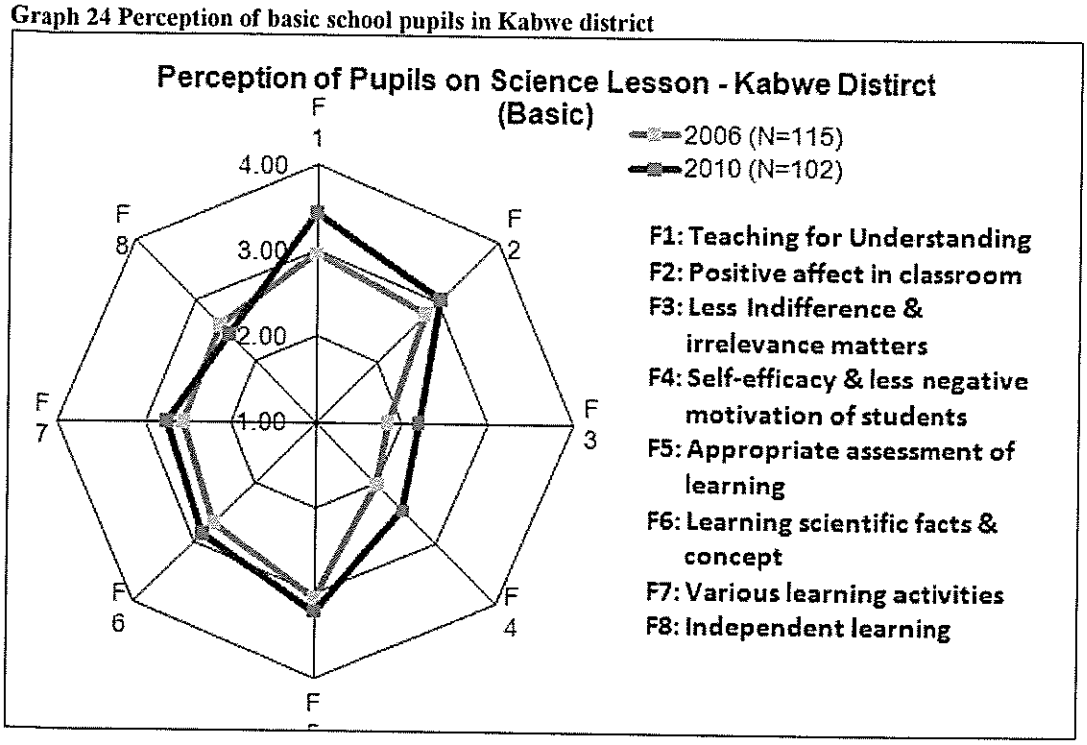
KABWE DISTRICT

1. PERCEPTION OF PUPILS

Basic Schools

From the **Graph 24**, the factor 1- teaching for understanding, and factor 4 – self – efficacy & less negative motivation of students, has made a significant improvement and as a whole there is an improvement though factor 8- independent learning has not improved but decreases below the initial of 2006.

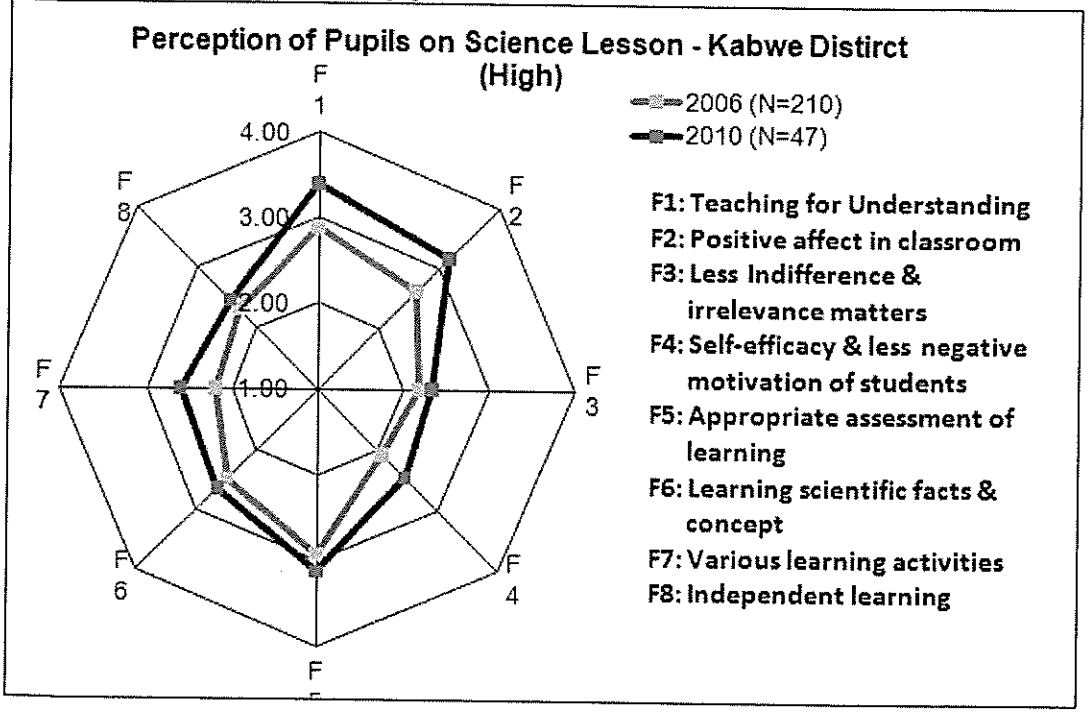
Graph 24 Perception of basic school pupils in Kabwe district



High Schools

The **Graph 25** has shown that the true work on the ground. The improvement has been noted to see the whole graph to be a success in all the factors. This tells us that the pupils' perception in the district generally say the teaching has a positive impact since the project began.

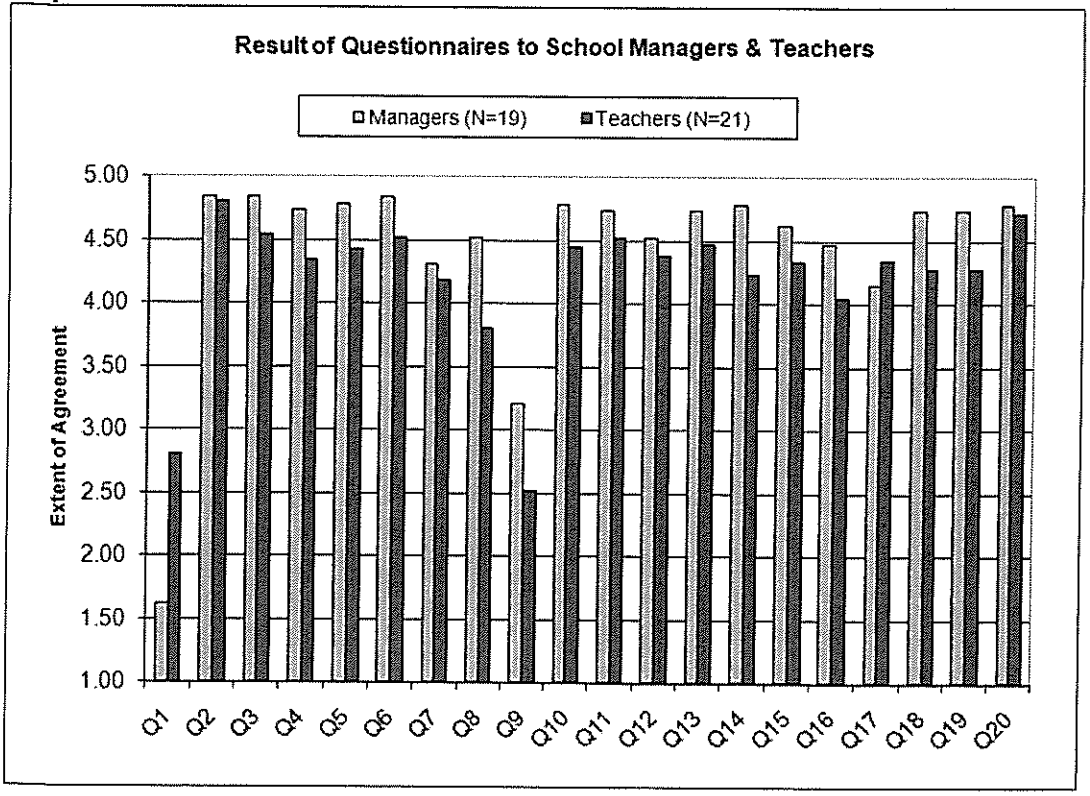
Graph 25 Perception of High school pupils in Kabwe district



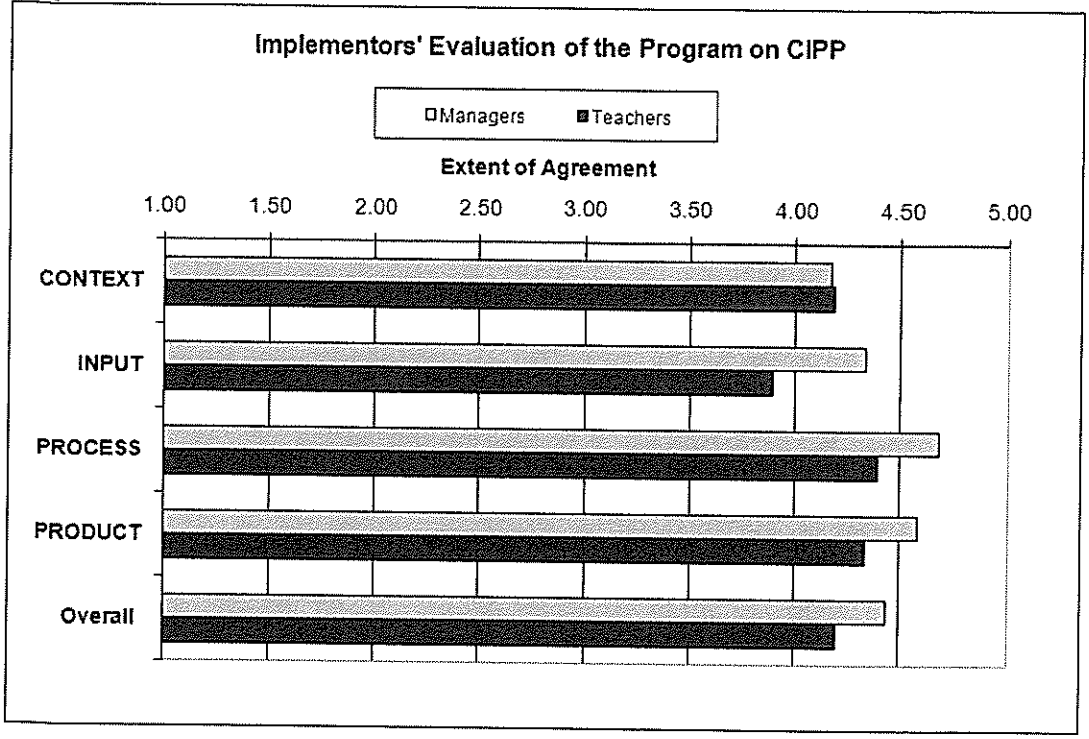
2. TEACHERS AND MANAGERS

From the **Graph 26** it can be seen that teachers and manager's extent of agreement for Context is above 3.5, Input is above 3, Process is above 3.5 and Product is above 3. This means that with the implementation of the program (SBCPD) there is great improvement in the teaching and learning activities. Managers from the overall CIPP Chart agree more compared to teachers.

Graph 26



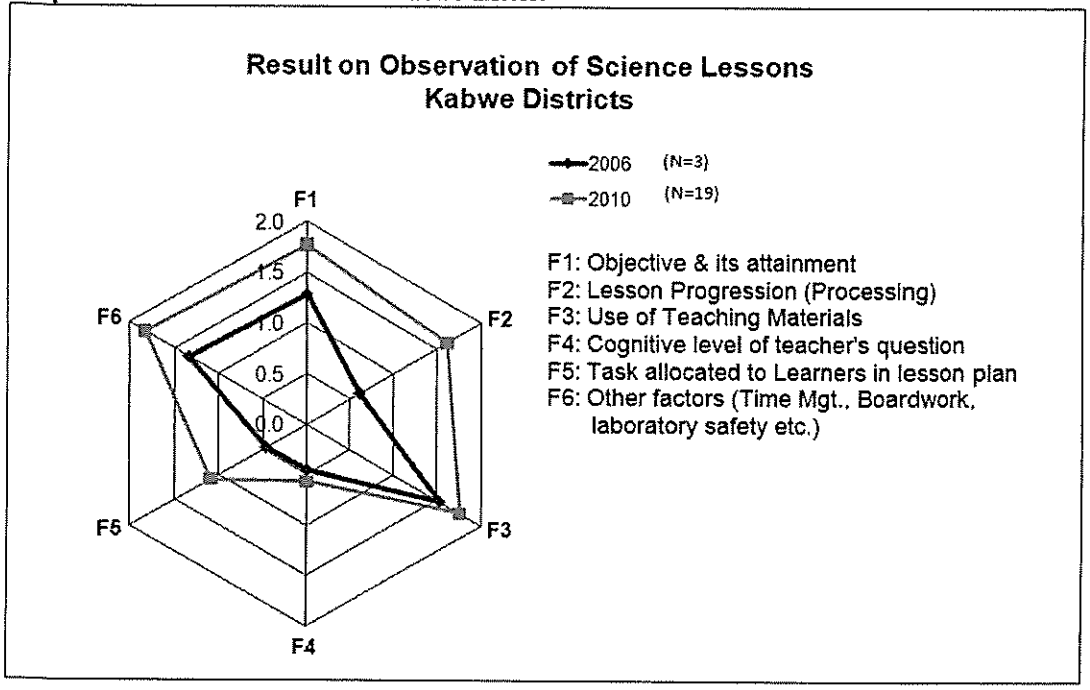
Graph 27



3. OBSERVATON OF LESSON

The facts are overwhelming from the graph. There has been great significant in observation results. The work being done by the teachers has improved from last time the research was carried out. The improvement has been seen in all the factors and the impact of this is a good sign. It is a positive result though factor 4 is the lowest. There is need to make mention that factor 2 has greatly improved and is the highest positive result as depicted on the graph.

Graph 28 Observation of lessons in Kabwe district



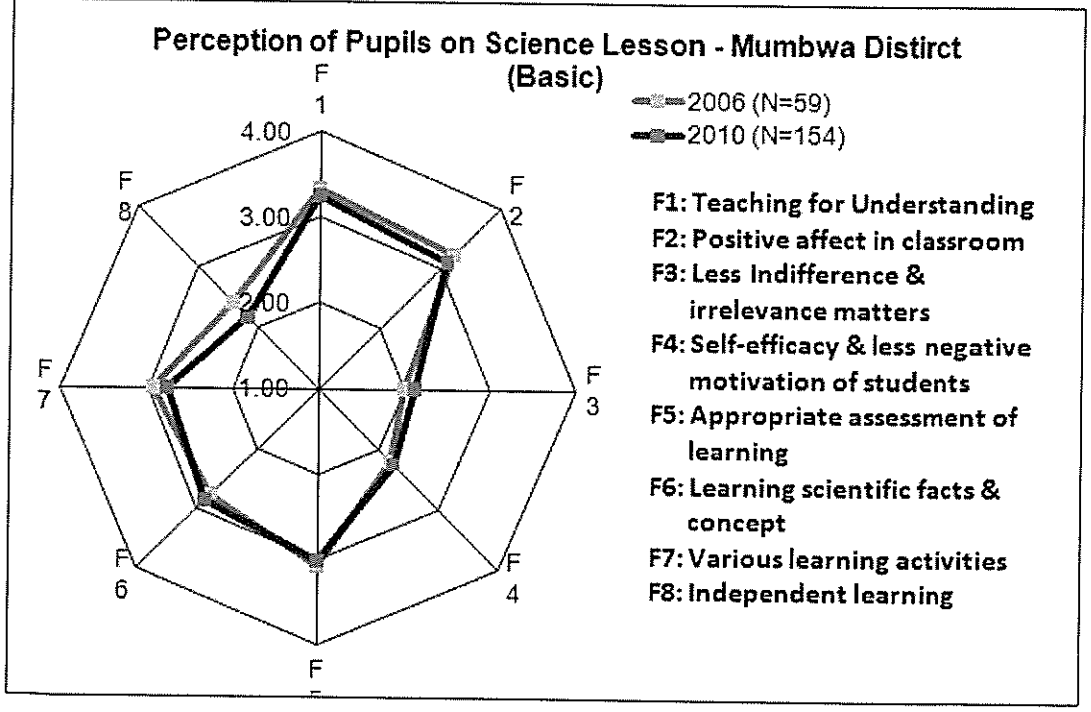
MUMBWA DISTRICT

1. PERCEPTION OF PUPILS

Basic Schools

The graph evidently shows that there is not much positive result from the pupils view. As compared to 2006 graph, the 2010 graph shows it has actually reduced and that is in all the factors. However, it has been observed that factor 3 and 6 show signs of slight improvement though not much significant.

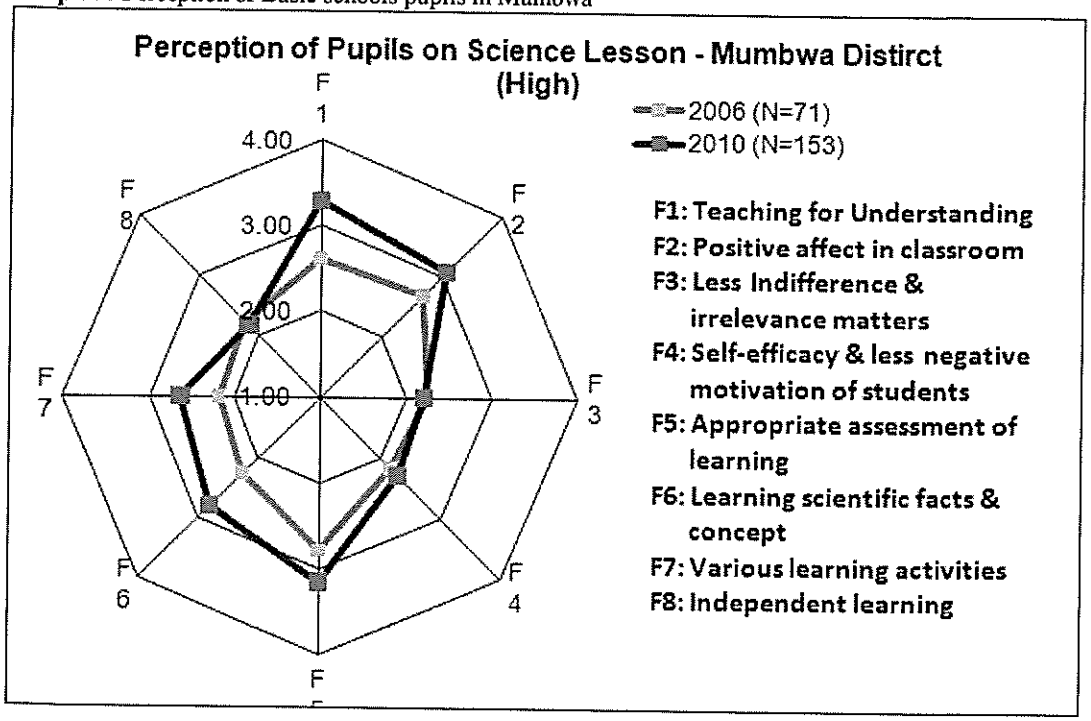
Graph 29 Perception of basic schools in Mumbwa district



High Schools

Positive results have been observed and this can be seen on the graph. All in all the graph shows that the project has yielded a positive result in high school of the district. However, factors 2 and 8 have nit changed but remained constant as in 2006.

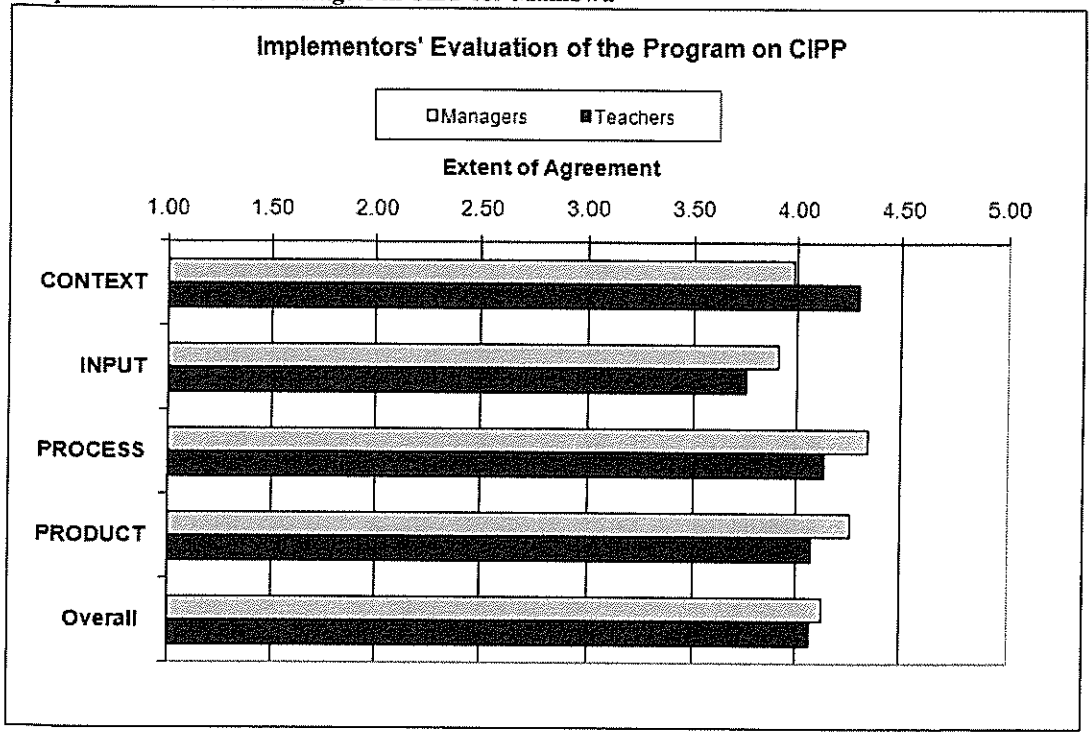
Graph 30 Perception of Basic schools pupils in Mumbwa



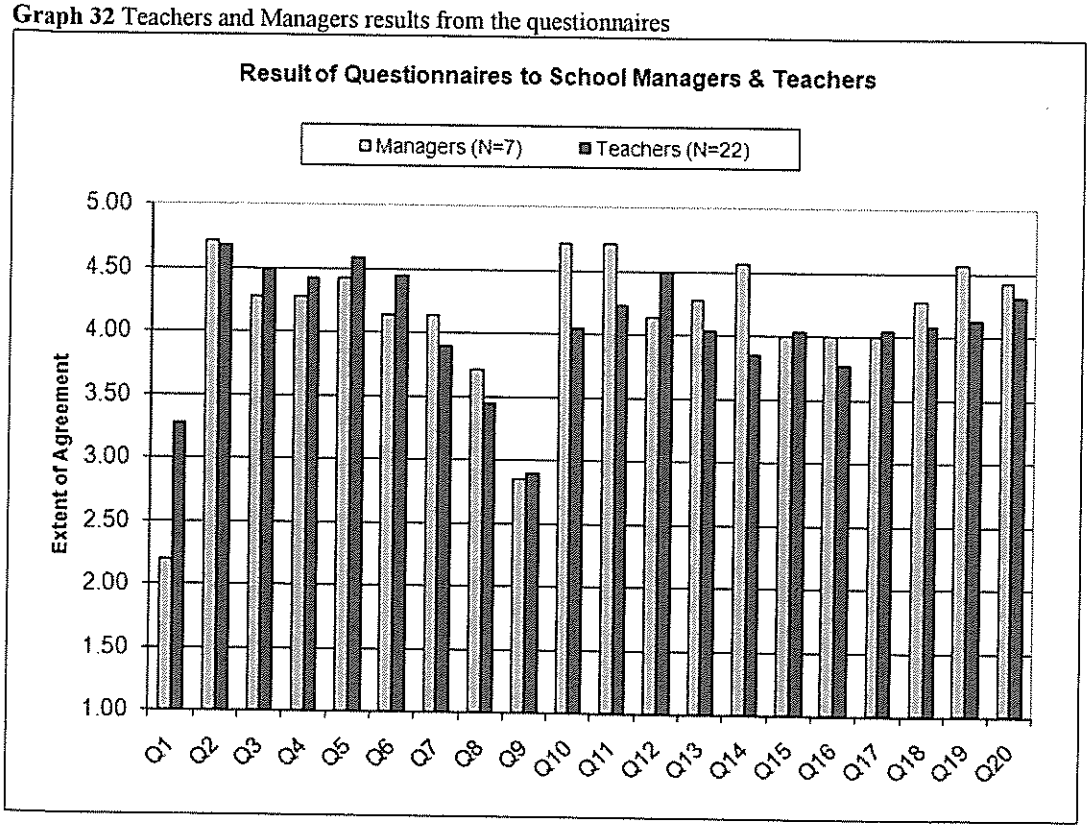
2. TEACHERS AND MANAGERS

From the **Graph 31 and 32** it can be seen that teachers and manager's extent of agreement for Context is above 3.8, Input is above 3, Process is above 4.2 and Product is above 4.1. This means that with the implementation of the program (SBCPD) there is great improvement in the teaching and learning activities. As the CIPP chart shows the overall results shows that both are in agreement with minimal difference between them, both slightly above 4.1 and below 4.25.

Graph 31 Teachers and Managers in CIPP for Mumbwa



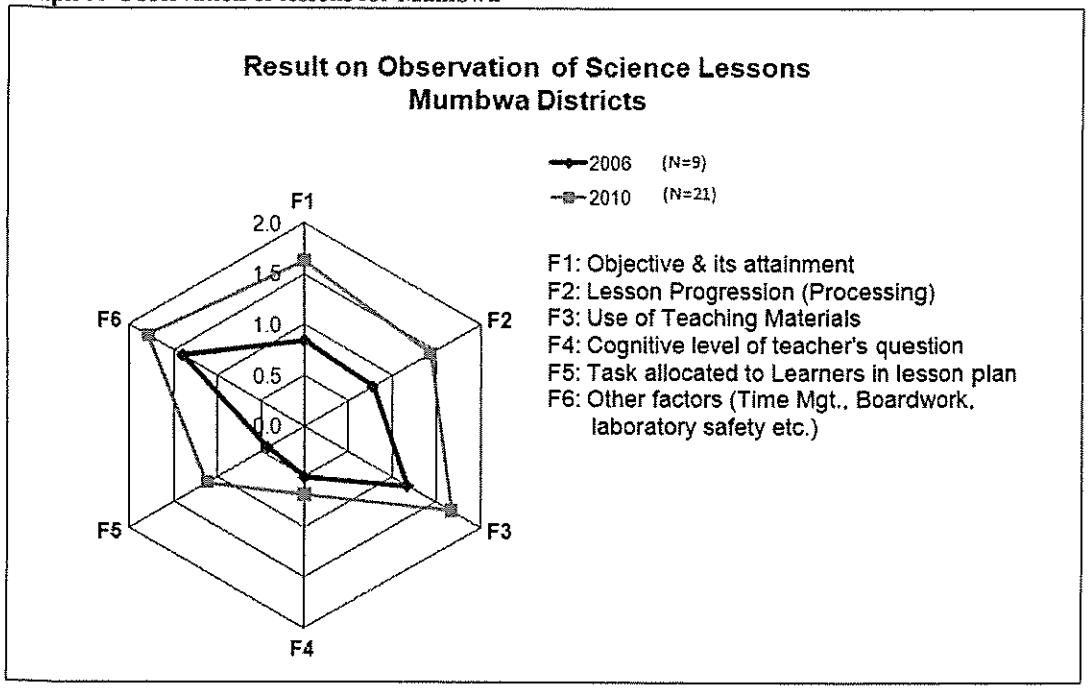
Graph 32 Teachers and Managers results from the questionnaires



2. OBSERVATION OF LESSONS

As the graph shows, the results from the observation are really positive. This means all the targets have been successfully reached and beyond. The improvement compared to 2006 is astonishing. This tells that the teachers are doing a good job.

Graph 33 Observation of lessons for Mumbwa



RECOMMENDATION

When the analysis of the data was been done it was noted that the data that came in was not consistent. For instance, from some districts and schools it was noticed that the number of questionnaires were more than other. This from a different view may affect the true and right graph to be shown, because the numbers are not fixed. For instance the managers in schools submitted only (7) seven questionnaires answered and in some had (23) twenty three. Some pupils questionnaires submitted from high schools were generally 150 but in Mumbwa district had more than 300 which in comparison may affect the true representation.

CONCLUSION

On a general view the program carried out was a success. The project has had a positive impact on the way the teachers teach and pupils understanding of the lessons taught in class. According to the observations, the project is doing fine with only two areas or factors are having problem.

Annex 1

List of Teachers who were observed

District	Observation of Science Lesson (by Format 02)			
	School	Teacher	T. S	Subject
High Schools (Grade 10 - 12)				
(1.) Kabwe	Stephen Luwisha	Mwakacheya J. N	88575	Biology
	Rapheal Kombe	Kalisilile H. L.	803097	Physics
	Kabwe High	Chanda Royd Simon	801676	Physics
		Ms. Mpoha	81540	Biology
	Bwacha	Chewe W.	56218	Physics
	Jasmine Boys	Mr. Mumbi L.	803113	Chemistry
(2.) Serenje	Ibolelo High	Mr. O. Mpasela	500152	Physics
		Mr. Katongo E.	803955	Chemistry
	Serenje High	Mr. Phiri L.	53769	Chemistry
		Mr. Machiko M.	803939	Chemistry
	Mukando	Mr. Chabu M.	500429	Physics
	Mupepetwe High	Mr. O. Mbao	500509	Chemistry
(3.) Chibombo	Maamba High	Mr. Ng' ambi R.	57662	Physics
		Mr. Nicholas Bwalya	803388	Physics
	Chipembi Girls	Shikabongo Regina	804072	Chemistry
		Moonga William	802422	Biology
		Mrs. Chituka Given N.	804078	Biology
		Mrs. Samba Mporokoso	801620	Chemistry
	Chibombo High	Mr. Mulenga A.	53272	Biology
		Mr. Maposa K.	800114	Physics
(4.) Kapiri Mposhi	Kapiri Mposhi High	Ms. Nelly Nambeya	57108	Biology
	St. Pauls High	Mr. Kwalila J.	84450	Chemistry
	Mpunde Girls	Mr. Bwalya A.	89801	Physics
		Mr. Mbao T. M.	807425	Physics
	Mukonchi	Mr. Chipeta M.	803620	Physics
		Muchebo Joel	804085	Chemistry
	Lukanda	Mr. C. Kabwe	56031	Physics
(5.) Mkushi	Chalata High	Ndeka A. N.	57417	Chemistry
	Mkushi High	Mrs. Nkandu T. C.	803051	Biology
		Mr. Mwape K.	804122	Chemistry
		Sinkala Robby	501135	Physics
		Matawe Miyanda	604101	Chemistry
	Chipata High	Sichikaile Phayas	89848	Chemistry
		Simwanza Mulenga	501134	Physics
		R. S. Muyunda	54633	Biology
(6.) Mumbwa	Sanje High	Ms. Mzumara T.	806099	Chemistry
		Siantale L. K.	55031	Chemistry
	Nsanje High	Mr. Phiri	54500	Biology
	Mumbwa High	Hamusonda B.	803758	Chemistry
		Ms. Phiri	804096	Biology
		Mr. Kalaluka Njekwa	82302	Chemistry
		Fwambo T.	804104	Chemistry
		Mr. Kalinga F.	89822	Chemistry
		Mr. Phiri B. S.	805390	Physics
		Mr. Simon Zulu	85396	Biology
	Nampundwe High	Wamunyima M.	804088	Chemistry
		Mr. Mwiinde B.	802057	Biology
		Shimaluba J.	56341	Chemistry

District	Observation of Science Lesson (by Format 02)			
	School	Teacher	T. S	Subject
Basic Schools (Grade 8 - 9)				
(1.) Kabwe	Stephen Luwisha	Walker H.	17527	Agriculture Science
	Angelina Tembo	Simuliye E.	802480	Env. Science
	Broadway	Ms. Brenad Musonda	54361	Env. Science
	Buseko Basic	Andrew Sinkala	803955	Env. Science
	Katondo	Kademaunga C.	-	Env. Science
	Mine Basic	Ms. Moonga T.	804000	Env. Science
	Naambe	Chuunda Ashebo	500573	Env. Science
	Ngungu Basic	Mercy Mulenga	500558	Env. Science
	Nkwashi Basic	Mary Nanyinza	57781	Env. Science
		Muyoma Lesley	56958	Env. Science
	Sacred Heart	Mr. Chilunzi	-	Env. Science
	Caritas Convent	Mrs. Kapasa	803942	Env. Science
	Mwashi Upper Basic	Lizazi M.	57646	Env. Science
(2.) Serenje	Nchimishi Basic	Mr. Mutale R	57094	Env. Science
	Chibale Basic	Mr. Muyinda B.	502780	Env. Science
	Mupepetwe Basic	B. H. Mweemba	501583	Env. Science
	Serenje Boma Basic	Mr. Mukuta	501615	Env. Science
		Mr. Chipenda C.	55732	Env. Science
	Kamwala Basic	Mr. Mambwe Malipalo	501188	Env. Science
		Mr. E. Zulu	56884	Env. Science
	Mukando Basic	Mr. Kamba K.	802936	Env. Science
	Ndabala Basic	Mr. Phiri E. R	19939	Env. Science
	Mulilima Basic	Mr. Munakeka D. L.	55715	Env. Science
		Mr. Lizazi	501205	Env. Science
	Chibobo Basic	Mr. Chibuye K.	56881	Env. Science
	Chimupati Basic	Mrs. Sampa	57139	Env. Science
	Kofi Kunda Basic	Mr. Ngwenya D.	501593	Env. Science
(3.) Chibombo	Chisamba Upper Basic	Musonda Chrispin	803385	Env. Science
		Mr. Botha Jacob	801619	Env. Science
	Chipembi Girls	Phiri Paul	802404	Env. Science
	Liteta Basic	Mr. Sinkala E.	802482	Env. Science
		Ms. Katembula E.	802389	Env. Science
	Golden Valley Upper Basic	NgoNa Mweemba	57105	Env. Science
	Nachiyaba	Mr. Chisha I.	57708	Env. Science
	Kampekete Basic	Mr. Phiri	-	Env. Science
	Chibombo Basic	Mr. Hachab C. M.	57683	Env. Science
	Mwayasunka Basic	Ms. Kapumpa G.	56319	Env. Science
	Moomba Upper Basic	Mr. walamba Mike	802486	Env. Science
(4.) Kapiri Mposhi	Lukanda Basic	Mrs. Kasonde E. K.	17500	Env. Science
	Hiltop	Kunda B.	806134	Env. Science
	St. Pauls	Mr. Sichone K.	806145	Env. Science
	Chibwe Basic	Mr. Mugla Mwaba	57579	Env. Science
	Matilyo Basic	Mr. Nsondo R. M.	55888	Env. Science
	Mpunde Girls	Mr. Kakwama	88929	Env. Science
	Palamedes	Mr. Mbafuta C.	57664	Env. Science
	Mulonga Basic	Mr. Mfune Gilbert	55331	Env. Science
		Mr. Mwanza S.	503668	Env. Science

	Lukomba Basic	Mr. Mulenga J. K.	56296	Env. Science
	Kapiri Basic	Musonda	-	Env. Science
		Chicheleko C.	55815	Env. Science
		Sr. Nyondo Theresa	804013	Env. Science
(5.) Mkushi	Chibefwe Basic	Mr. Chiluba	56030	Env. Science
	Changilo	Mr. Matengu	803996	Env. Science
		Singlingili Martin	502456	Env. Science
	Chalata Basic	Mr. Kalasa C.	500006	Env. Science
	Mkushi Boma Basic	Chengele Maxwell	803001	Env. Science
		Ndileya Boyd	501101	Env. Science
	Munsakaba	Sachele B.	501136	Env. Science
		Kabunda A.	500017	Env. Science
	Farm Block Basic	Muzyambo Marvin	5502827	Env. Science
	Nkolonga Basic	Imasiku Imasiku	502182	Env. Science
(6.) Mumbwa	Bulungu Basic	Ms. Katwamba	-	Env. Science
		Mr. Mundia	-	Env. Science
		Mr. Bwalya E.	-	Env. Science
	Sanje	Mrs. Mwale M. J. P	56455	Env. Science
	Nampundwe Basic	Mr. Mukale	53296	Env. Science
	Kalilwe Basic	Mr. Saipi	806153	Env. Science
		Twaambo Hanalete	804023	Env. Science
		Mrs. Ngoma M.	57882	Env. Science

Basic Schools

Questionnaire for pupils (by Format 03)		
School	No. of pupils involved	
	F	M
1. Stephen Luwisha	8	0
2. Angelina Tembo	10	0
3. Broadway	7	6
4. Buseko Basic	5	5
-	-	-
5. Mine Basic	2	5
-	-	-
6. Ngungu Basic	6	3
7. Nkwashi	13	10
8. Caritas Convent	11	0
9. Mwashi Upper Basic	3	7
1.Kofi Kunda Basic	1	1
2. Mulilima Basic	7	7
3. Ndabala Basic	3	3
4. Chibobo Basic	4	4
5. Chibale Basic	4	5
6. Chimupati Basic	5	4
7. Kamwala Basic	4	3
8. Mupepetwe Basic	4	4
9. Mukundo Basic	4	4
10. Serenje Boma Basic	8	8
	10	11

Chibombo basic Schools	24	25
Kapiri Mposhi	47	36
Mkushi	33	42
Mumbwa	84	62

High Schools

Questionnaire for pupils (by Format 03)		
School	No. of pupils involved	
	F	M
1. Bwacha	5	4
2. Rapheal Kombe	20	0
3. Stephen Luwisha	7	0
4. Jasmine Boys	0	9
1. Ibolelo High	6	7
2. Serenje High	0	17
-	8	6
3. Mupepetwe High	1	3
-	-	-
Chibombo High Schools	99	0
Kapiri Mposhi High Schools		
Mkushi High Schools	36	28

Mumbwa High Schools	34	33

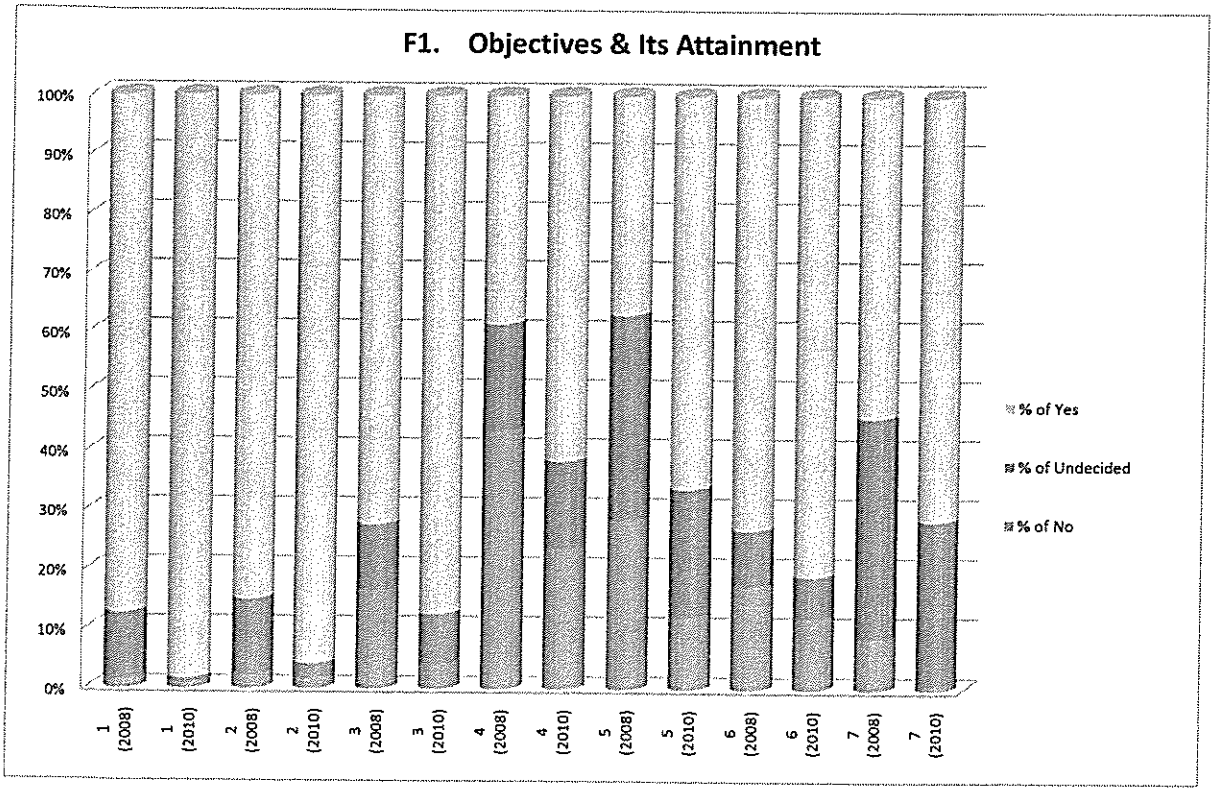
ABBREVIATIONS

CIPP	Context, Input, Process, Product
MoE	Ministry of Education
SBCPD	School-Based Continuing Professional Development
SMASTE	Strengthening of Mathematics, Science and Technology Education
SPRINT	School Program of In-service for the Term
TGM	Teachers Group Meeting
PEST	Provincial Education Support Team
DEST	District Education Support Team

Result of Supplementary Analysis of Lesson Observation　(Copperbelt Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

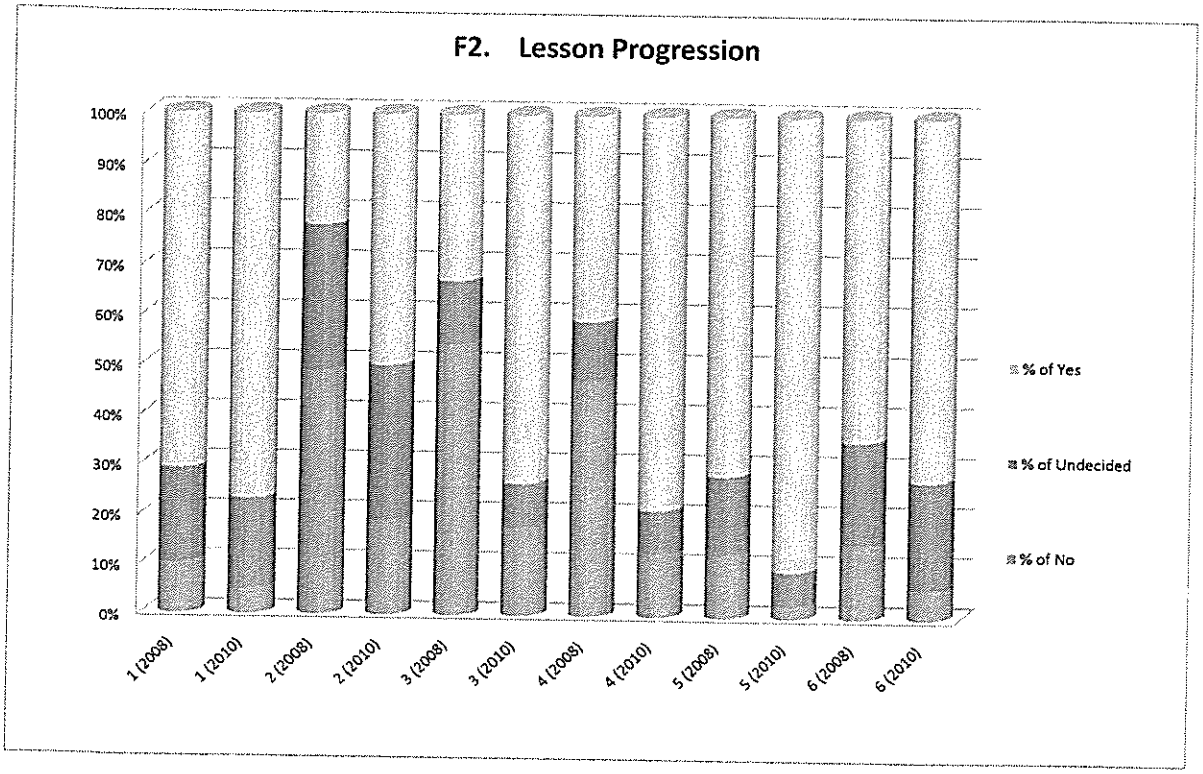
Year	2008	2010
Total # of observations	127	114

F1. Objectives & Its Attainment		Year	N	% of No	% of Undecided	% of Yes
1	Are the lesson objectives clearly stated in the lesson plan?	1 (2008)	127	2%	11%	87%
		1 (2010)	118	1%	1%	98%
2	Can the stated objectives be attained in a lesson?	2 (2008)	127	2%	13%	85%
		2 (2010)	119	2%	3%	96%
3	Are the stated objectives measurable?	3 (2008)	127	17%	11%	72%
		3 (2010)	119	4%	8%	87%
4	Were the lesson objectives told to the students during the lesson?	4 (2008)	127	43%	18%	39%
		4 (2010)	115	23%	15%	62%
5	In a lesson, did the students find core contens or concept by themselves?	5 (2008)	127	28%	35%	37%
		5 (2010)	117	12%	21%	66%
6	Was there time for evaluating or confirming what the students had learned?	6 (2008)	127	17%	9%	73%
		6 (2010)	116	12%	7%	81%
7	Did most of the students attain lesson objectives?	7 (2008)	127	9%	37%	54%
		7 (2010)	113	1%	27%	72%



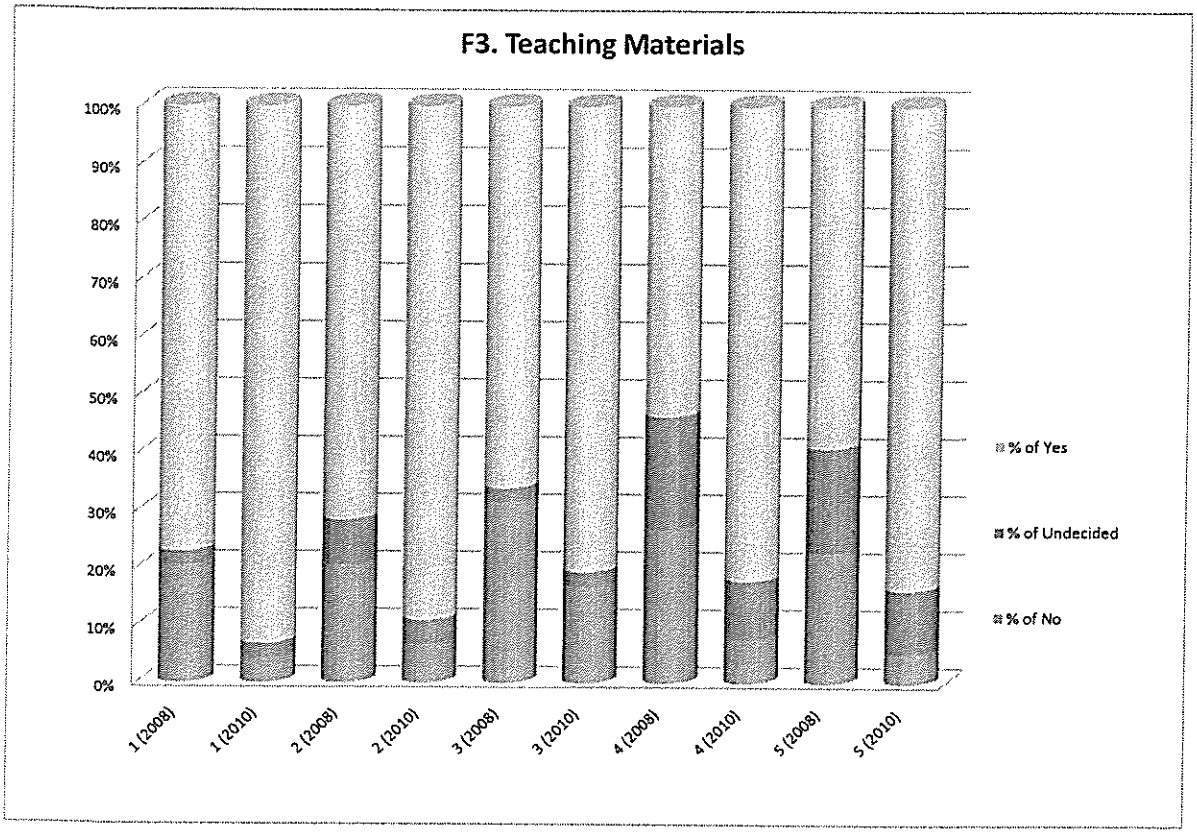
Result of Supplementary Analysis of Lesson Observation (Copperbelt Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

F2.	Lesson Progression	Year	N	% of No	% of Undecided	% of Yes
1	Did the introductory part of the lesson motivate students well?	1 (2008)	127	10%	19%	71%
		1 (2010)	117	5%	18%	77%
2	Did the teacher ask the students to hypothesize a solution before instructing them to have an activity or experiment?	2 (2008)	127	49%	29%	22%
		2 (2010)	116	19%	31%	50%
3	There was a presentation by students after an activity.	3 (2008)	127	54%	13%	33%
		3 (2010)	113	18%	9%	73%
4	There was a disscusion among students to find answers or better solutions to the given task	4 (2008)	127	47%	12%	41%
		4 (2010)	117	13%	9%	79%
5	The teacher intended to confirm scientific concept or values in the process of teaching.	5 (2008)	127	13%	16%	72%
		5 (2010)	117	3%	7%	91%
6	Both the teacher and the students were able to conclude what they had learned in a lesson.	6 (2008)	127	15%	20%	65%
		6 (2010)	116	6%	22%	72%



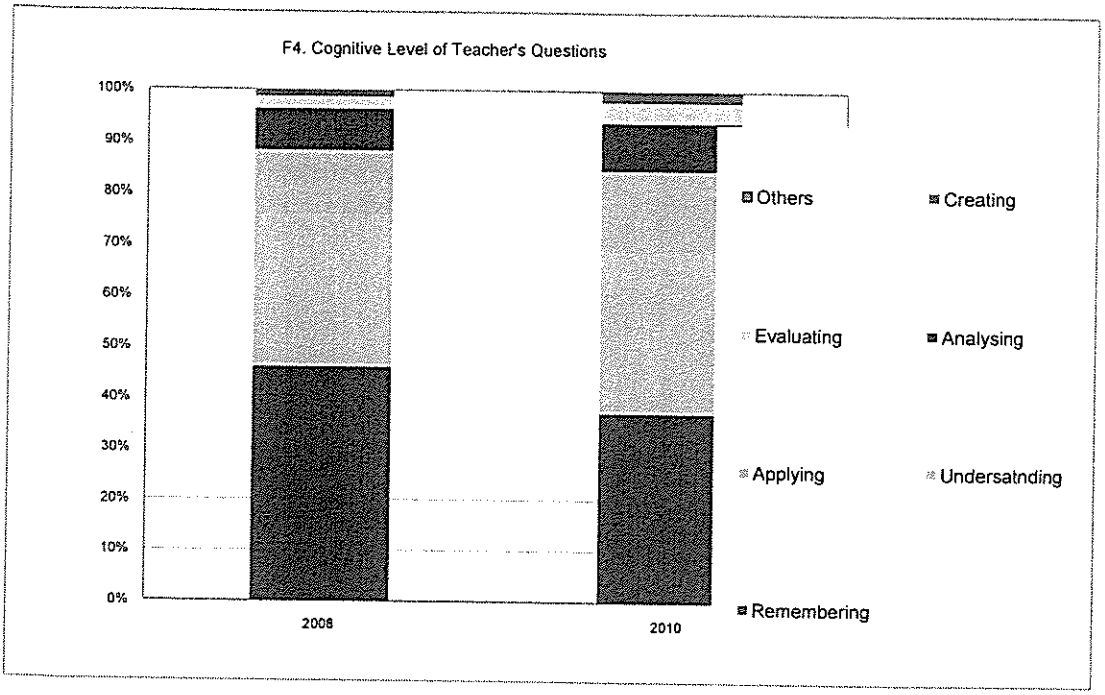
Result of Supplementary Analysis of Lesson Observation (Copperbelt Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

F3.	Teaching Materials	Year	N	% of No	% of Undecided	% of Yes
1	Did the teacher use any kind of teaching materials apart from blackboard and chalk?	1 (2008)	127	20%	2%	77%
		1 (2010)	118	4%	3%	93%
2	Teaching materials were prepared properly before the lesson.	2 (2008)	127	20%	8%	72%
		2 (2010)	119	7%	4%	89%
3	The teacher used improvised or locally available teaching materials in a lesson.	3 (2008)	127	31%	2%	66%
		3 (2010)	119	17%	3%	81%
4	The students were able to use or understand the prepared teaching materials.	4 (2008)	127	27%	20%	54%
		4 (2010)	118	8%	10%	82%
5	Teaching materials used in a lesson enhanced students' understandings.	5 (2008)	127	23%	18%	59%
		5 (2010)	117	5%	11%	84%

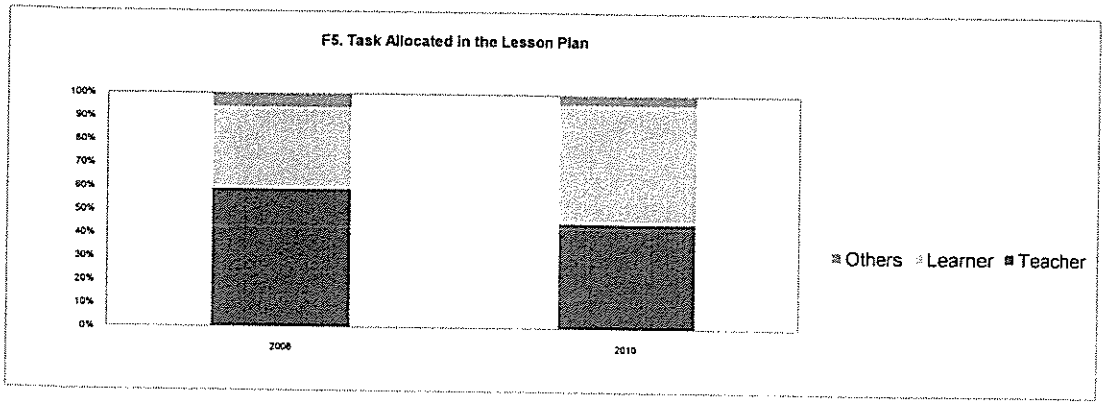


Result of Supplementary Analysis of Lesson Observation (Copperbelt Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

F4. Cognitive level of teacher's question	2008 (N=127) %	2010 (N=114) %
Remembering	46.04	37.71
Undersatnding	26.65	26.73
Applying	10.70	15.66
Analysing	6.52	10.97
Evaluating	3.01	10.16
Creating	2.88	3.21
Others	0.00	0.00

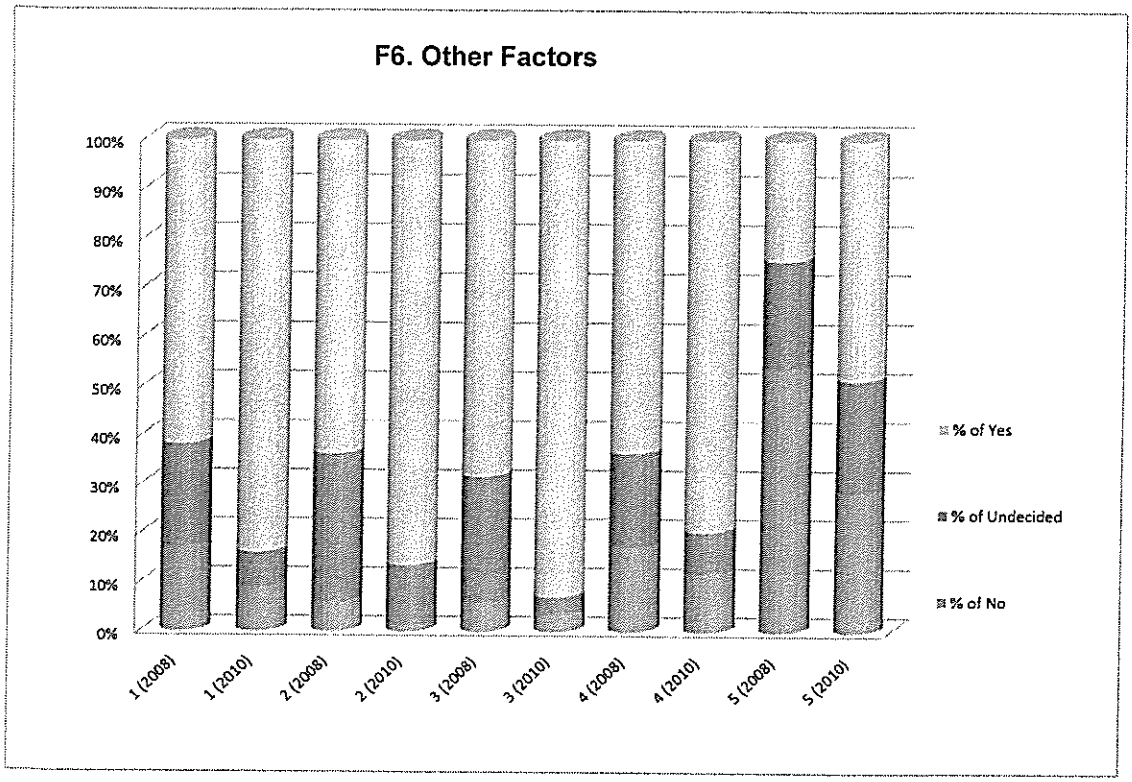


F5. Task Allocated in the Lesson Plan	2008 (N=127) %	2010 (N=119) %
Teacher centered tasks on a lesson plan	56.90	47.75
Learner centered tasks on a lesson plan	41.77	50.42
Other descriptions (None of Above)	0.29	3.78



Result of Supplementary Analysis of Lesson Observation (Copperbelt Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

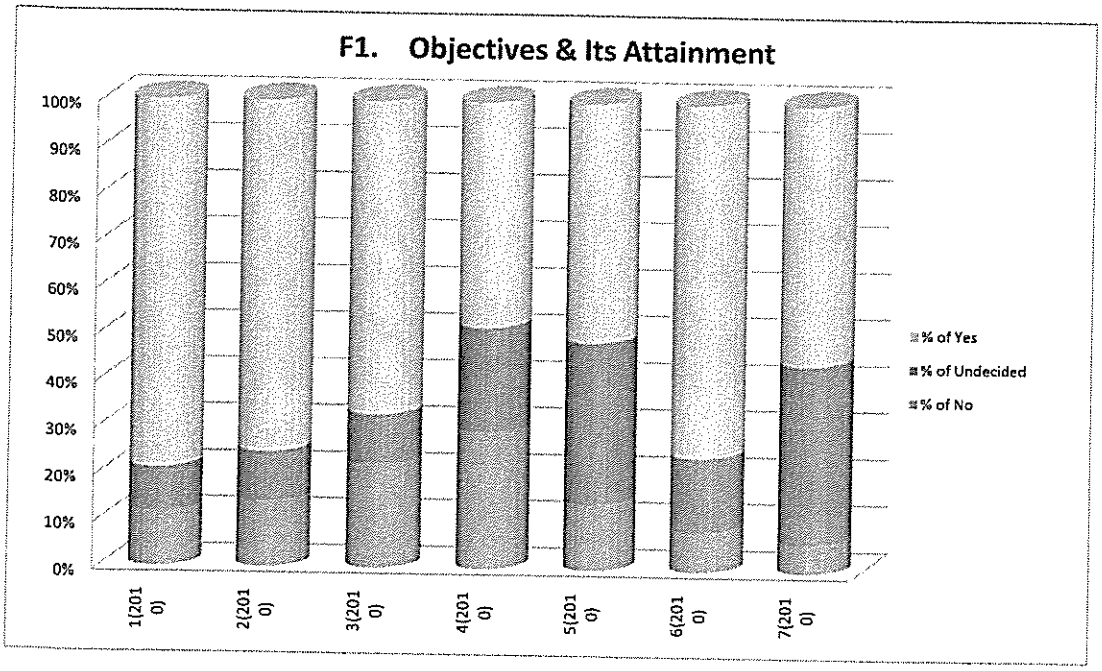
F6.	Other Factors	Year	N	% of No	% of Undecided	% of Yes
1	The teacher managed time well during lesson implementation.	1 (2008)	127	11%	17%	72%
		1 (2010)	113	11%	15%	73%
2	The teacher prepared for the lesson well.	2 (2008)	127	4%	21%	75%
		2 (2010)	117	3%	10%	85%
3	The teacher managed the blackboard very well.	3 (2008)	127	9%	10%	81%
		3 (2010)	116	4%	9%	85%
4	There were no problems in line with laboratory safety in a lesson.	4 (2008)	127	29%	18%	53%
		4 (2010)	113	12%	23%	64%
5	In a lesson, students were guided on taking notes or records well.	5 (2008)	127	41%	16%	43%
		5 (2010)	113	23%	19%	58%



Result of Supplementary Analysis of Lesson (Copperbelt Province - Non-pilot) 2010 (endline)

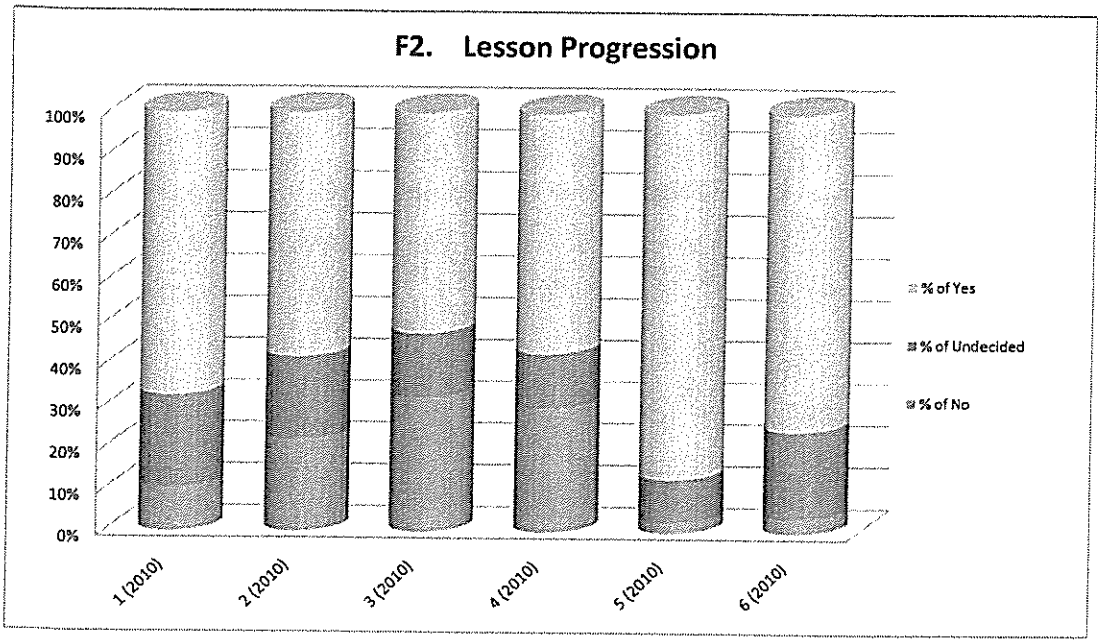
Year	2010
Total # of observations	85

F1.	Objectives & Its Attainment	Year	% of No	% of Undecided	% of Yes
1	Are the lesson objectives clearly stated in the lesson plan?	1(2010)	12%	9%	79%
2	Can the stated objectives be attained in a lesson?	2(2010)	14%	11%	75%
3	Are the stated objectives measurable?	3(2010)	22%	11%	67%
4	Were the lesson objectives told to the students during the lesson?	4(2010)	29%	22%	48%
5	In a lesson, did the students find core contens or concept by themselves?	5(2010)	14%	35%	51%
6	Was there time for evaluating or confirming what the students had learned?	6(2010)	9%	16%	76%
7	Did most of the students attain lesson objectives?	7(2010)	6%	38%	56%



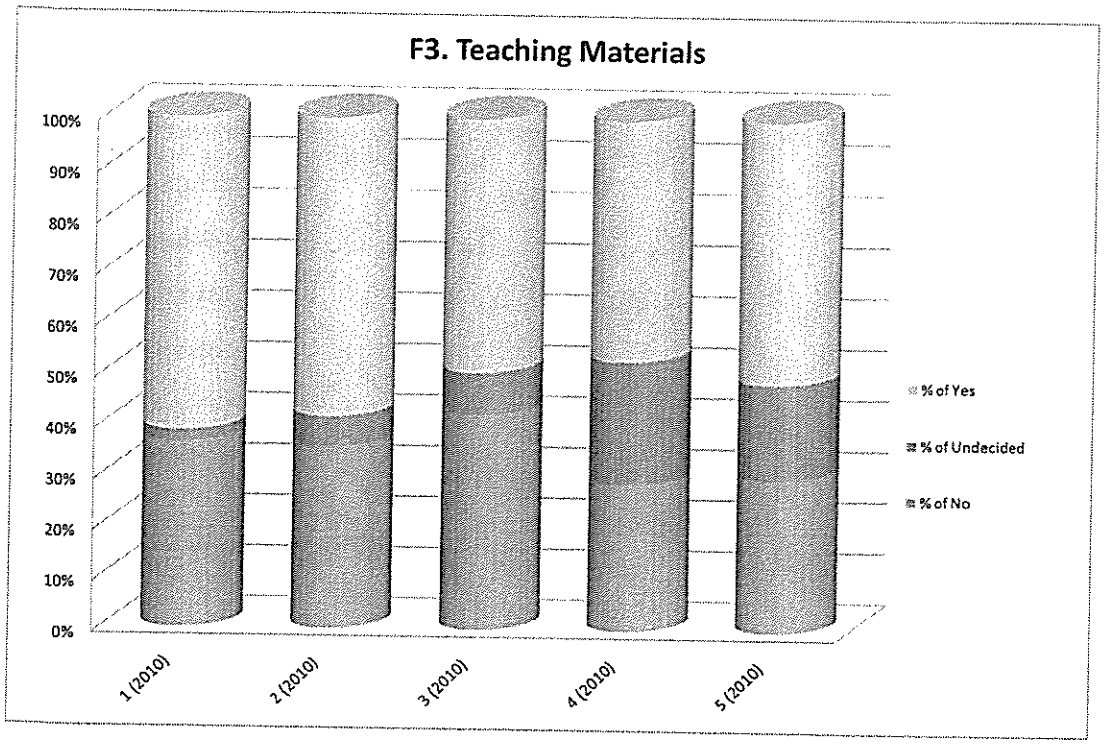
Result of Supplementary Analysis of Lesson (Copperbelt Province - Non-pilot) 2010 (endline)

F2.	Lesson Progression	Year	% of No	% of Undecided	% of Yes
1	Did the introductory part of the lesson motivate students well?	1 (2010)	10%	22%	67%
2	Did the teacher ask the students to hypothesize a solution before instructing them to have an activity or experiment?	2 (2010)	22%	20%	58%
3	There was a presentation by students after an activity.	3 (2010)	32%	15%	52%
4	There was a disscusion among students to find answers or better solutions to the given task	4 (2010)	30%	13%	57%
5	The teacher intended to confirm scientific concept or values in the process of teaching.	5 (2010)	3%	10%	87%
6	Both the teacher and the students were able to conclude what they had learned in a lesson.	6 (2010)	4%	21%	76%



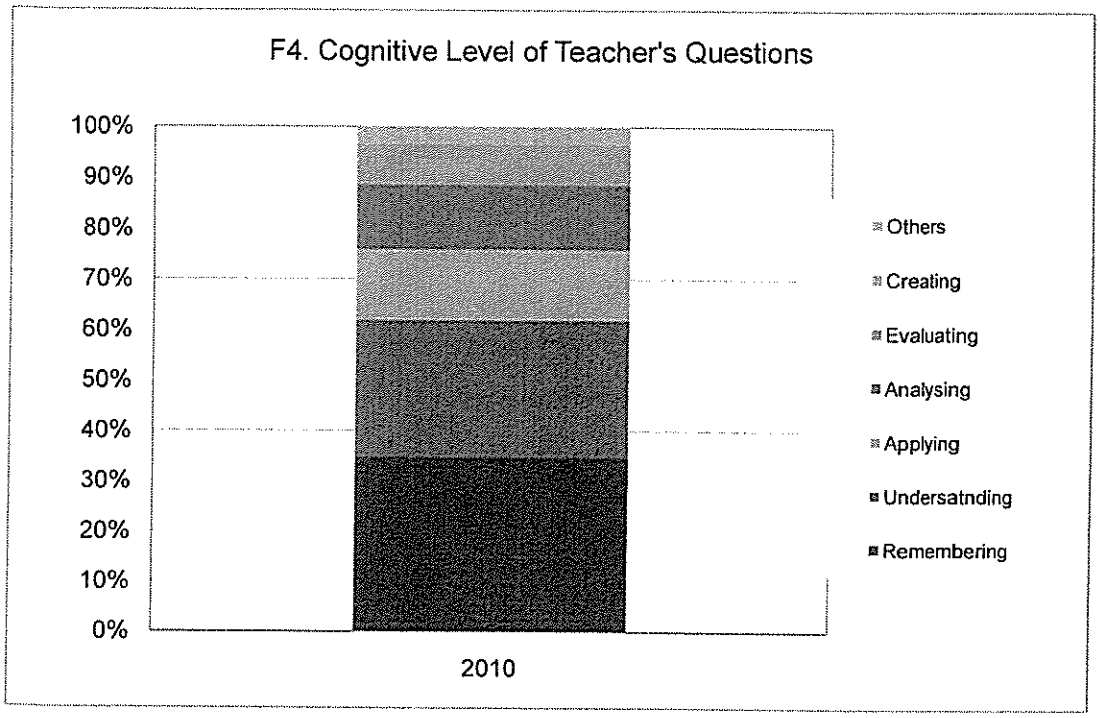
Result of Supplementary Analysis of Lesson (Copperbelt Province - Non-pilot) 2010 (endline)

F3.	Teaching Materials	Year	% of No	% of Undecided	% of Yes
1	Did the teacher use any kind of teaching materials apart from blackboard and chalk?	1 (2010)	36%	2%	61%
2	Teaching materials were prepared properly before the lesson.	2 (2010)	36%	6%	58%
3	The teacher used improvised or locally available teaching materials in a lesson.	3 (2010)	42%	8%	49%
4	The students were able to use or understand the prepared teaching materials.	4 (2010)	29%	24%	47%
5	Teaching materials used in a lesson enhanced students' understandings.	5 (2010)	30%	19%	51%

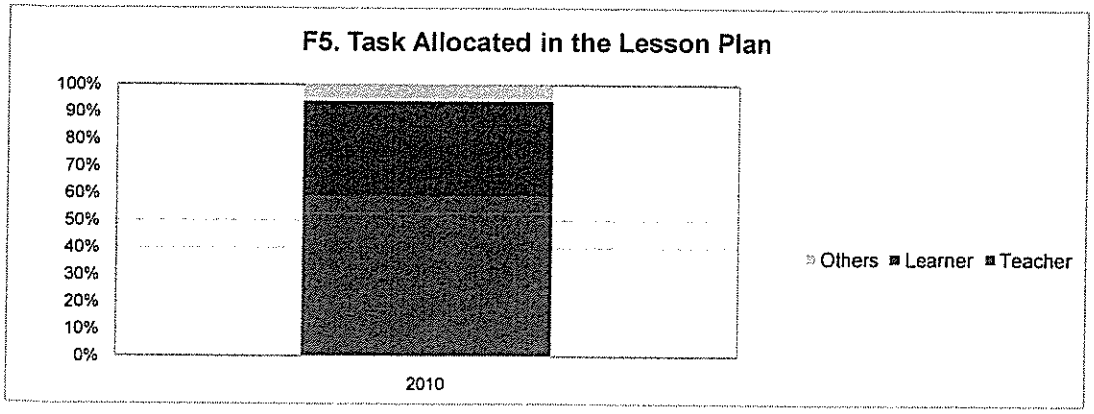


Result of Supplementary Analysis of Lesson (Copperbelt Province - Non-pilot) 2010 (endline)

F4. Cognitive level of teacher's question	2010
	%
Remembering	32.84
Undersatnding	25.58
Applying	13.27
Analysing	12.05
Evaluating	7.51
Creating	3.23
Others	0.00

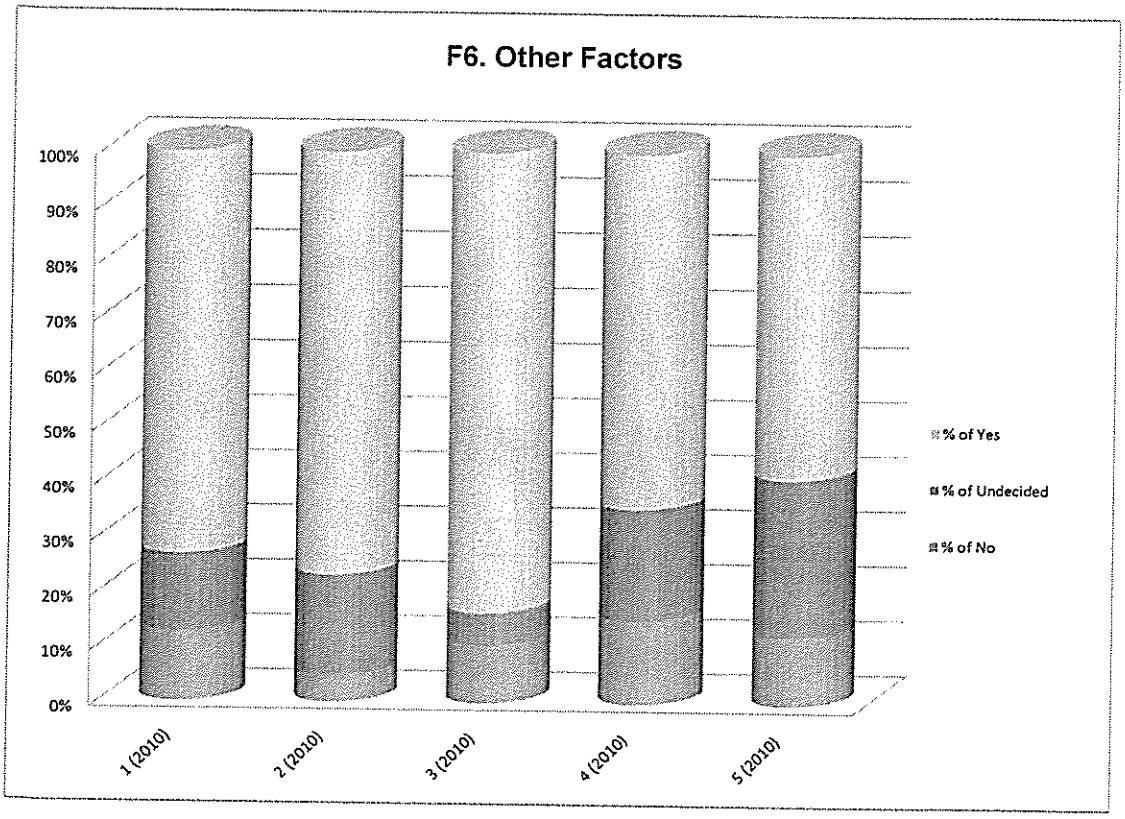


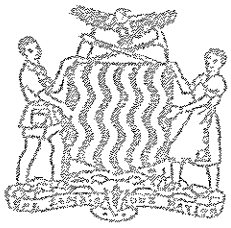
F5. Task Allocated in the Lesson Plan	2010
	%
Teacher	58.89
Learner	35.24
Others	5.88



Result of Supplementary Analysis of Lesson (Copperbelt Province - Non-pilot) 2010 (endline)

F6.	Other Factors	Year	% of No	% of Undecided	% of Yes
1	The teacher managed time well during lesson implementation.	1 (2010)	13%	14%	73%
2	The teacher prepared for the lesson well.	2 (2010)	5%	18%	77%
3	The teacher managed the blackboard well.	3 (2010)	11%	6%	84%
4	The teacher gave enough attention to safety of learning environment.	4 (2010)	15%	20%	64%
5	The teacher guided puplis on taking notes or recordes well.	5 (2010)	13%	29%	59%





Report on the End-line Survey of SMASTE-SBCPD Program On The Copperbelt Province

July-August 2010

Prepared by JICA Research Assistants:

George Nawa
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Edited by: Copperbelt SMASTE PEST Team

Republic of Zambia
Ministry of Education
Copperbelt Province

SMASTE Science School-based CPD Project

1.0 INTRODUCTION

Ministry of Education and Japan International Co-operation Agency (JICA) agreed on the implementation of Strengthening of Mathematics, Science and Technology Education, School-Based Continuing Professional Development (SMASTE-SBCPD) as a Technical Cooperation Project. The first phase of the project covered Central Province from 2005-2007, while Copperbelt and Northwestern Provinces joined during phase II whose duration has been 2008-2011.

The expected outputs of the project phase2 are:

Output1: Lesson study activities in science are introduced to schools at Grade 8-12 in Northwestern Province and Copperbelt Province

Ouput2: Lesson Study is strengthened in Central Province

Outpu3: Lesson Study framework is integrated into Grade 1-7 SBCPD based on the experience on Grade 8-12 of Central Province

Output4: Teaching Skills Book is developed based on the experience of the three target provinces

Output5: Management Skills Book on SBCPD for school managers is developed based on the experiences of the three target provinces

Output6: Monitoring of SBCPD is improved in the target provinces.

As Copperbelt Province, the related outputs are **Output1, Output4, Output5, and Output6**

The project phase II is scheduled to end in February 2011 and therefore there has arisen a need to conduct an End line survey to observe the outputs of the project. In the Endline survey, the data has been collected in the same manner as in the Baseline survey and both data will be compared and analyzed.

2.0 OBJECTIVE

Apart from the above stated overall outputs of the entire Project Phase II, the focus of the End line survey has been:

- To assess the impact of lesson study activities on the quality of teaching and learning in the Classroom.
- To find out what improvements if any have been made during implementation by comparing the results of the Baseline to those of the Endline survey.
- To learn lessons which could assist with any further improvements to the program

3.0 METHODOLOGY

3.1 Period:

The Baseline survey was conducted during the month of October 2008 while the Endline Survey covered a period between July to August, 2010.

3.2 Conductors:

Both the Baseline and Endline Surveys were conducted by Groups of Science and Mathematics Teachers who were earlier identified at the Start of Project Phase II for their good performance in classroom practice and then trained as Facilitators of Lesson Study Activities in their Clusters. This

Training was held at Mulungushi University in 2008 using local as well as Third Country Trainers from CEMESTEA Kenya.

3.3 Instruments:

In general, four instruments were used in the End line Survey namely:

i) Lesson Assessment tool-format2
This instrument is classroom based and it assesses a lesson against six factors:

- Objectives and its attainment,
- Lesson Progression,
- Use of teaching and learning materials,
- Cognitive level of teacher's questions,
- Proportion of task allocation between learners and teacher
- Other matters such as time management.

ii) Questionnaire for Pupils on the perception of the Lesson-format3
The second is the perception of pupils of the Lesson taught by their Science teachers using instrument (format 3). This tool has eight (8) parts which assess:

- There is teaching for understanding
- There are positive affects of lessons in the classroom
- Less Indifference & irrelevance matters
- Self-efficacy & less negative motivation of students
- Whether there is appropriate assessment of learning
- Whether there is learning of scientific facts & concepts
- Whether teacher uses various learning activities
- Whether learners are engaged in independent learning activities

iii) Questionnaire for teachers on Implementaion of SBCPD-format4
iv) Questionnaire for Head teachers on implementation of SBCPD-format5
These two instruments check for any agreement or disagreement on implementation levels of SBCPD Activities in Schools between teachers and administrators of Schools. The questions used in them are similar but approached from the stand point of the teacher (format4) or the Head teacher(format5)

3.4 Coverage:
While the Baseline had involved 140 Schools, the Endline Survey captured 106 schools. There was a drop of 24% in the number of Schools captured largely because of logistical challenges such as transport and involvement of some Facilitators in Mock Examinations in some Clusters. In Chingola District, for instance, one Facilitator committed suicide and another died from natural causes and the survey in schools covered by these two facilitators was affected.

4.0 SAMPLING

4.1 Lesson Observation

The table below shows lessons which were observed by facilitators during Baseline survey in 2008 compared to those captured in the Endline survey in respective Districts and Schools:
(Annex11: List of Teachers Who Where Sampled and Lessons They Taught)

TABLE1;

District	School	No. of teachers	
		2008	2010
Ndola	Fatima.	2	2
	Masala High	2	5
	Temweni High	Not visited	3
	Ndeke Caritas High	1	4
	Chifubu A Basic	3	3
	Kamba Basic	2	3
	St Bonaventure Basic	Not visited	1
	Malasha Basic	1	4
	Twikatane Basic	2	Not visited
	Lubuto High	4	Not visited
	Chilengwa High	1	Not visited
	Chiluba Basic	1	Not visited
	Twapia Basic	1	Not visited
	Ndola Girls High	1	Not visited
	Milemu High	1	Not visited
	Kayele High	2	Not visited
	Chifubu High	1	Not visited
	Kanseshi High	2	Not visited
	Pamodzi High	1	Not visited
	Mwabombeni Basic	1	Not visited
	Malasha Basic	6	Not visited
	Dominican Convent	3	Not visited
Mufurila	Ipusukilo High	2	3
	Chakwa High	1	2
	Taungup High	Not visited	1
	Kantashi	1	2
	Buyantanshi Basic	2	2
	Mutundu Basic	2	2
	Kasumba Basic	3	1
	Mufurila Basic	1	3
	Twashuka Basic	1	2
	Muleya Basic	1	3
	Twampane Basic	Not visited	3
	Kamuchanga Basic	3	2
	Kalanga Basic	2	2
	Pamodzi Girls	1	3
	Kantanshi High	3	2
Kitwe	Mukuba High	1	3
	Nkana High	1	1
	Chimwemwe High	1	1
	Chibote Girls High	1	1
	Mindolo High	1	1
	Kitwe boys High	1	2
	Wusakile High	1	1
	Hellen Kaunda High	1	1
	Chamboli High	1	Not visited
	Malela High	1	Not visited
	Ndeke High	1	1

	Justine Kabwe Basic	1	Not visited
	Ndeke Basic	1	1
	Butotelo Basic	1	Not visited
	Ipusukilo Basic	1	1
	Bupe Basic	1	Not visited
	Kamitondo Basic	1	1
	Ganatone Basic	1	1
	Mwekera Basic	1	1
	Mindolo Basic	2	1
	Rokana Basic	1	1
	Natwange Basic	1	1
	Kafue basic	1	1
	Mama Muntu	1	Not visited
	Kamdenbo	1	Not visited
	Kamfinsa High	1	1
	Buntungwa Basic	1	2
	Mitanto	1	Not visited
	Kabwe Basic	Not visited	1
Luanshya	Mpatamato High	4	1
	Nkulumashiba High	Not visited	2
	Roan Antelope High	2	1
	Mpelembe Basic	1	2
	Nkulumashiba Basic	4	4
	Twatemwa Basic	Not visited	3
	Mikomfwa Basic	1	1
	Buteko Basic	1	1
	Ndelela Basic	Not visited	2
	Kasama Basic	Not visited	1
	Mpatamato Basic	2	2
	Mipundu Basic	Not visited	3
	Kansumbi Basic	3	1
	Kawama Basic	Not visited	1
	Chaisa Basic	1	Not visited
	Luanshya Girls High	3	Not visited
	Twashuka High	1	Not visited
	Dagama	1	Not visited
	Luanshya Central	1	Not visited
	Mpatamato Basic	2	Not visited
	Luanshya Boys High	1	Not visited
	Kabunbi Basic	2	Not visited
Chililabombwe	Chililabombwe High	Not visited	2
	Muleya High	Not visited	2
	Mitondo High	Not visited	3
	Kamenza Basic	Not visited	2
	Mingomba Basic	Not visited	3
	Lubengele Basic	Not visited	1
	Twafwane Basic	Not visited	3
	Chililabombwe Basic	Not visited	2
Masaiti	Kafulafuta	Not visited	1
	Chiwala High	Not visited	2
	Lumano Basic	Not visited	1

4

	Chamunda Basic	Not visited	1
	Masaiti Basic	Not visited	1
Chingola	Kabundi High	Not visited	3
	Maiteneke High	Not visited	1
	Sekela High	Not visited	2
	Chikola High	Not visited	2
	Twatasha Basic	Not visited	3
	Matelo Basic	Not visited	1
	Twateka Basic	Not visited	2
	Chingola High	Not visited	3
Lufwanyama	St Joseph High	Not visited	2
	Kalumbwa High	Not visited	4
	St Joseph Basic	Not visited	2
	Nkana Basic	Not visited	3
	Mibenge Basic	Not visited	3
	Shimukunami Basic	Not visited	5
	Chapula Basic	Not visited	2
	Milopa Basic	Not visited	2
Mpongwe	Mpongwe High	Not visited	3
	Ibenga Girls	Not visited	2
	Kasamba Basic	Not visited	1
	Mpongwe Basic	Not visited	1
Kalulushi	Kalulushi High	2	2
	Chavuma High	3	2
	Chati High	2	2
	Chambishi High	3	2
	Kankoshi Basic	1	1
	Kafubu Basic	1	1
	Ichimpe Basic	1	1
	Chibote Basic	1	1
	Chembe Basic	1	2
	Fibale Basic	1	1
	Lubuto Basic	1	1
	Kalulushi Basic	1	1
	Mitobo Basic	1	1
	Twalubuka Basic	1	1
	Chavuma Basic	Not visited	1
	Chibuluma Basic	1	1
	Masamba Basic	1	1
	Lukoshi Basic	1	1
	St. Marcelliness High	2	2
	Chambishi Basic	Not visited	1
Total		**145**	**205**

From the table, 145 teachers were observed in 2008 compared to 205 in 2010. The disparity is largely accounted for by the fact that in the End line, all the non pilot districts submitted their data for analysis and hence more teachers were captured.

4.2 Pupils, teachers' and headteachers' questionnaires

The next table shows raw data on numbers of pupils, teachers and Heat teachers who answered questionnaires per district as well as per target school.

TABLE2: List of Schools involved in the research

District	School	No. of pupils respondents	No. of teachers respondents	No. of school managers respondents
Ndola	Fatima.	17	2	1
	Masala	20	5	Not submitted
	Temweni	38	3	Not submitted
	Ndeke	19	4	1
	Chifubu A Basic	25	3	2
	Kamba Basic	31	3	Not submitted
	St Bonaventure Basic	28	1	1
	Malasha Basic	11	4	1
Mufurila	Ipusukilo	9	3	1
	Chankwa	6	2	1
	Taungup	10	1	2
	Kantanshi Basic	6	2	1
	Buyantanshi Basic	8	2	1
	Mutundu Basic	2	2	1
	Kasumba Basic	7	1	1
	Mufurila Basic	12	3	2
	Twashuka Basic	14	2	1
	Muleya Basic	11	3	1
	Twampane Basic	11	3	1
	Kamuchanga Basic	15	2	1
	Kalanga Basic	5	2	1
	Pamodzi Girls	10	3	1
	Kantanshi High	5	2	Not submitted
Kitwe	Mukuba	11	3	Not submitted
	Nkana	10	1	Not submitted
	Chimwemwe	2	1	1
	Chibote Girls	4	1	1
	Mindolo	2	1	2
	Kitwe boys	3	2	1
	Wusakile	2	1	2
	Hellen Kaunda	7	1	1
	Chamboli	4	Not visited	1
	Malela	2	Not visited	1
	Ndeke	3	1	1
	Justine Kabwe Basic	2	Not submitted	2
	Ndeke Basic	11	1	1
	Butotelo Basic	3	Not submitted	2
	Ipusukilo Basic	2	1	2
	Bupe Basic	7	Not submitted	2
	Kamitondo Basic	7	1	1
	Ganatone Basic	4	1	1
	Mwekera Basic	10	1	1
	Mindolo Basic	6	1	2
	Rokana Basic	9	1	2

	Natwange Basic	5	1	Not submitted
	Kamfinsa High	7	1	Not submitted
	Natwange Basic	5	1	1
	Buntungwa Basic	11	2	1
	Kafue Basic	7	1	1
Luanshya	Mpatamato	5	1	1
	Nkulumashiba	10	2	1
	Roan Antelope	17	1	2
	Mpelembe Basic	9	2	1
	Nkulumashiba Basic	15	4	1
	Twatemwa Basic	13	3	2
	Mikomfwa Basic	15	1	1
	Buteko Basic	8	2	2
	Ndelela Basic	17	2	2
	Kasama Basic	17	1	1
	Mpatamato Basic	12	2	1
	Mipundu Basic	10	3	2
	Kansumbi Basic	7	1	1
Chililabombwe	Chililabombwe High	9	2	1
	Muleya	10	2	2
	Mitondo	20	3	2
	Kamenza Basic	10	2	Not submitted
	Mingomba Basic	7	3	Not submitted
	Lubengele Basic	8	1	Not submitted
	Twafwane Basic	10	3	Not submitted
	Chililabombwe Basic	6	2	Not submitted
Masaiti	Kafulafuta	14	1	2
	Chiwala	20	2	1
	Lumano Basic	30	1	1
	Chamunda Basic	20	1	1
	Masaiti Basic	15	1	1
Chingola	Kabundi	15	3	1
	Maiteneke	15	1	1
	Sekela	38	2	4
	Chikola	27	2	3
	Twatasha Basic	31	3	2
	Matelo Basic	15	1	1
	Twatenka Basic	20	2	Not submitted
	Chingola High	10	3	Not submitted
Lufwanyama	St Joseph	20	2	2
	Kalumbwa	23	4	1
	St Joseph Basic	27	2	1
	Nkana Basic	25	3	1
	Mibenge Basic	28	3	2
	Shimukunami Basic	25	5	1
	Chapula Basic	44	2	2
	Milopa Basic	11	2	Not submitted
Mpongwe	Mpongwe	36	3	1
	Ibenga Girls	20	2	1
	Kasumba Basic	29	1	2

	Mpongwe Basic	26	1	1
Kalulushi	Kalulushi	21	2	2
	Chavuma	24	2	1
	Chati	50	2	2
	Chambishi	25	2	1
	Kankoshi Basic	30	1	1
	Kafubu Basic	50	1	4
	Ichimpe Basic	10	1	1
	Chibote Basic	8	1	1
	Chembe Basic	9	2	1
	Fibale Basic	6	1	1
	Lubuto Basic	10	1	1
	Kalulushi Basic	8	1	1
	Mitobo Basic	9	1	1
	Twalubuka Basic	6	1	1
	Chavuma Basic	7	1	1
	Chibuluma Basic	9	1	1
	Masamba Basic	12	1	1
	Lukushi Basic	6	1	1
	St Marcelliness High	20	2	Not submitted
	Chambishi Basic	25	1	Not submitted
Total		**1541**	**205**	**116**

In all, 1541 Pupils, 205 Teachers and 116 Headteachers or their Deputies responded to the questionnaires.

5.0 RESULT AND ANALYSIS

5.1. Result on the Observation of Science Lessons (by format 02)

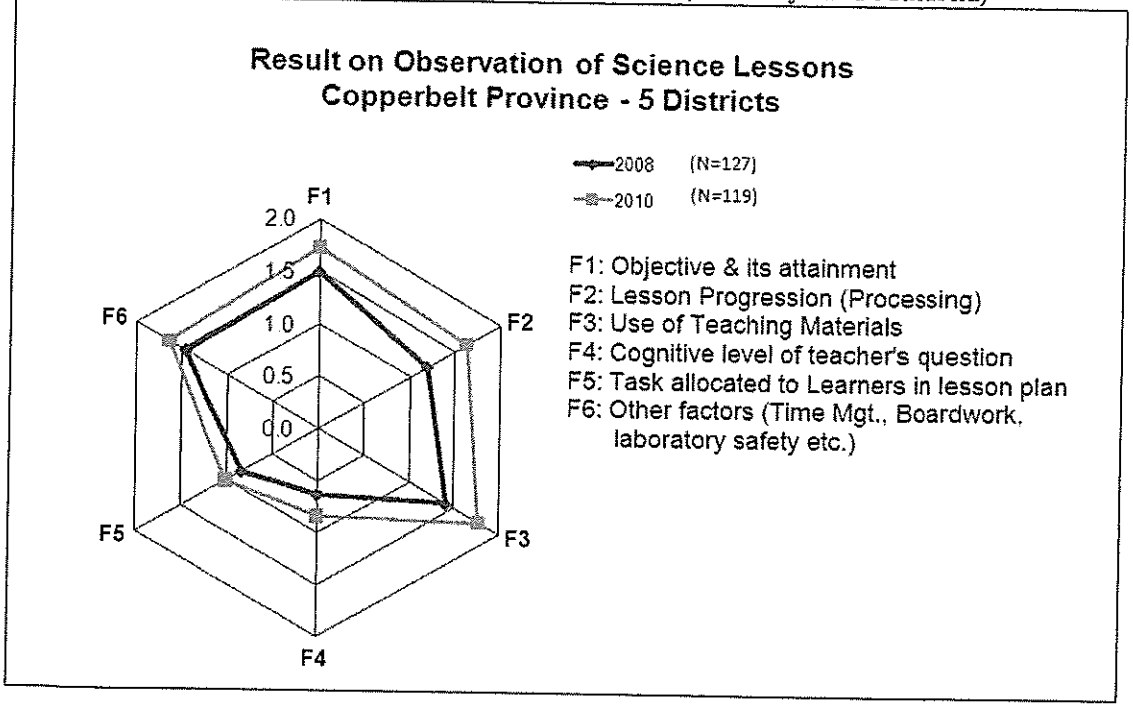
5.1.1. Result on the Observation of Science Lessons (Pilot Districts)

The data obtained using the Lesson observation sheet (Format 02) was transferred into Excel file and averages were calculated in each part of the instrument. "No" was counted as 0, while "Unclear is counted as 1, and "Yes" is 2. The results for the Endline compared to the Baseline are shown in Table 3 and 4.

Table 3: Result on the Observation of Science Lessons for the five (5) pilot Districts (Ndola, Kitwe, Kalulushi, Luanshya and Mufurila) **(Point: Max2, Min0)**

Analysis Factors	2008 (N=127)	2010 (N=119)	Improvement by (%)
F1: Objective & its attainment	1.49	1.73	**12%**
F2: Lesson Progression (Processing)	1.19	1.63	**22%**
F3: Use of Teaching Materials	1.41	1.78	**18%**
F4: Cognitive Level of Teacher's Questions	0.63	0.84	**10%**
F5: Task allocated to learners in Lesson Plan	0.84	1.01	**9%**
F6: Other factors (Time management, Board, work, Lab. Safety etc.)	1.46	1.64	**9%**

Figure 1: Comparison between Baseline and Endline on the Observation of Science Lessons for Five (5) pilot Districts (Ndola, Kitwe, Kalulushi, Luanshya and Mufurila)



5.1.2 Comparison of percentage of "YES" between 2008 and 2010 for 5 pilot districts:

- **F1:Objectives and their attainment**

  Question1: "Are the lesson objectives clearly stated in the lesson plan?" This item recorded an improvement of **12%.**

  Question2: "Can the stated objectives be attained in a lesson?" This item improved by **11%.**

  Question3: "Are the stated objectives measurable?" improved by **15%.**

  Question4: "Were the lesson objectives told to the students during the lesson?" This improved by **23%.**

  Question5: "In a lesson, did the students find core contents or concept by themselves?" improved by **29%.**

  Question6: "Was there time for evaluating or confirming what the students had learned?" improved by **8%.**

  Question7: "Did most of the students attain lesson objectives?" improved by **17%.**

- **F2: Lesson Progression**

  Question1: "Did the introductory part of the lesson motivate students well" improved by **6%.**

  Question2: "Did the teacher ask the students to hypothesize a solution before instructing them to have an activity or experiment" improved by **28%.**

  Question3: "There was a presentation by students after an activity" improved by **40%.**

  Question4: "There was a discussion among students to find answers or better solutions to the given task" improved by **38%.**

  Question5: "The teacher intended to confirm scientific concepts or values in the process of **teaching"** improved by **19%.**

  Question6: "Both the teacher and the students were able to conclude what they had learned in a lesson" improved by **8%.**

- **F3: Teaching Materials**

  Question1: "Did the teacher use any kind of teaching materials apart from blackboard and chalk" improved by **16%.**

  Question2: "Teaching materials were prepared properly before the lesson" improved by **17%.**

  Question3: "The teacher used improvised or locally available teaching materials in a lesson" improved by **15%.**

  Question4: "The students were able to use or understand the prepared teaching materials" improved by **29%.**

  Question5: "Teaching materials used in a lesson enhanced students' understandings" improved by **25%.**

5.1.3. Findings:

Comparing survey results of 2008 and 2010 for 5 pilot districts shows a marked improvement in factors 1 to 3 with the largest improvement of 22% recorded in factor 2 which measured lesson progression. However marginal improvements were recorded in factor 5 and 6 both of which showed an improvement of 9%. These two factors measured task allocation by the teacher and other considerations which add to a better lesson respectively. Factor 4, on questioning techniques only improved by 10% and this suggests that more attention should be given to the last three factors in phase 3 of lesson study activities

Some of the specific areas in which improvement has been noted and those in which more effort is required include:

a) An increase in the number of teachers who are willing to plan their lessons before embarking on teaching gone up.

b) At 11% improvement, teachers are slowly adopting the art of setting attainable lesson objectives and this still needs more focus in phase III.

c) At 7% improvement, the art of confirming what was learnt in a lesson together with learners still needs more attention in schools during phase III.

d) As high as 40% more teachers now allow learners to make a presentation after engaging them in an activity involvement of learners in activities aimed at enhancing learning was rare.

h) There has been an improvement of 28% on top of the 2008 level in numbers of lessons where a teacher has asked learners to hypothesize a scientific principle before asking them to prove by carrying out an experiment.

I) At 25% there has been a marked improvement in the use of teaching materials which enhance pupils' understanding.

j) At 15% rise above the 2008 level, the skills of improvisation in the absence of government procured apparatus is taking root in teachers of science on the Copperbelt

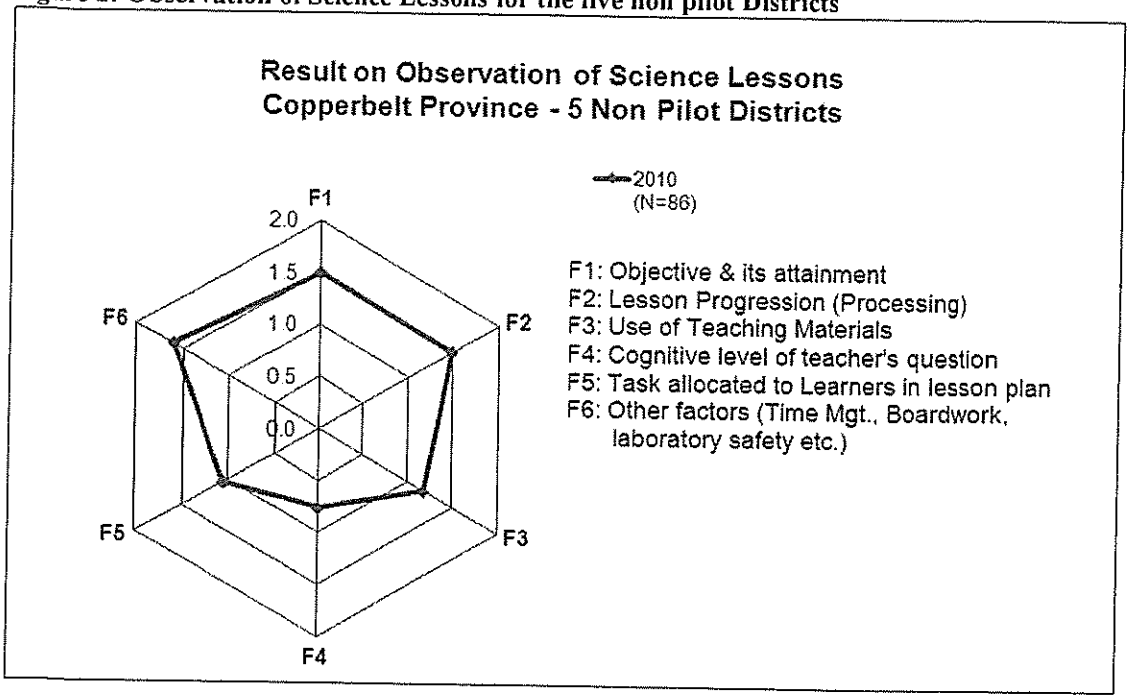
5.1.4. Result on the Observation of Science Lessons (Non Pilot Districts)

Table 4: Result on the Observation of Science Lessons for the five (5) non pilot Districts (Mpongwe, Lufwanyama, Chingola, Chililabobwe and Masaiti) (Point: Max2, Min0)

Analysis Factors	2010 (N=86)
F1: Objective & its attainment	1.49
F2: Lesson Progression (Processing)	1.49
F3: Use of Teaching Materials	1.19
F4: Cognitive Level of Teacher's Questions	0.76

F5: Task allocated to learners in Lesson Plan	1.05
F6: Other factors (Time management, Board, work, Lab. Safety etc.)	1.61

Figure 2: Observation of Science Lessons for the five non pilot Districts



From the Table 4 and Figure 2 we can conclude the following:

- F6; Other factors (time management, board, work, lab, safety etc) recorded 80% and this shows that there have been improvements in those areas making up factor 6.
- F1; Objective and its attainments and F2; Lesson progression have also seen reasonably good gains in non pilot districts as shown by the percentages in the Table. Therefore we can say with some certainty that teachers are now paying more attention to stating objectives of the lessons before embarking on teaching
- When it comes to use of Teaching material (F3) and Task allocation to learners in lesson plans (F5) more effort is needed to improve on the 59% and 53% recorded as this shows that teachers still have a lion's share of activities done in the classroom during teaching.
- F4; Cognitive level of teacher's question records 38% and this means that teachers are still asking question that demanded lower order thinking skills in the learners. More emphasis is therefore required in questioning techniques during phase III.

5.1.5. Result on the Observation of Science Lessons (Pilot Districts and Non Pilot Districts)

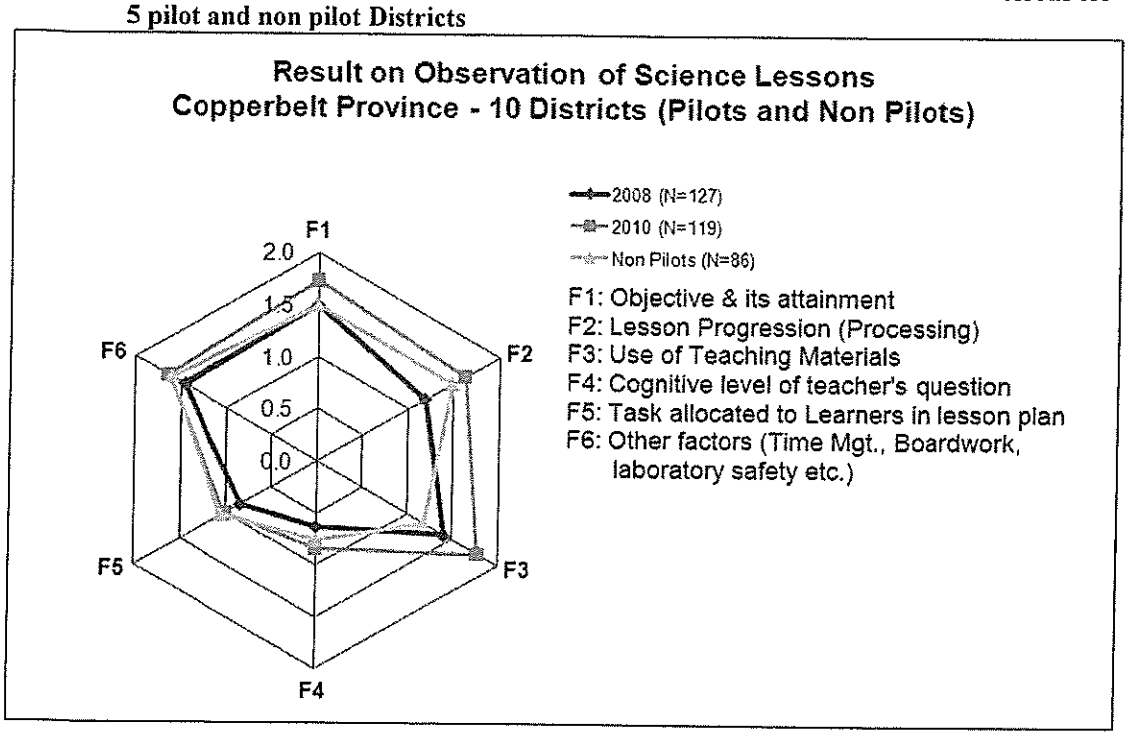
Table 5: Result on the Observation of Science Lessons for the 5 pilot (2008 and 2010) and non pilot Districts

(Point: Max2, Min0)

Analysis Factors	2008-Pilot (N=127)	2010 -Pilot (N=119)	2010 -Non-Pilot (N=86)
F1: Objective & its attainment	1.49	1.73	1.49
F2: Lesson Progression (Processing)	1.19	1.63	1.49

F3: Use of Teaching Materials	1.41	1.78	1.19
F4: Cognitive Level of Teacher's Questions	0.63	0.84	0.76
F5: Task allocated to learners in Lesson Plan	0.84	1.01	1.05
F6: Other factors (Time management, Board, work, Lab. Safety etc.)	1.46	1.64	1.61

Figure 3: Comparison between Baseline and Endline on the Observation of Science Lessons for 5 pilot and non pilot Districts



Comparison between pilot and non pilot districts for 2010:

- **F1: Objectives and their attainment**

  Question1: "Are the lesson objectives clearly stated in the lesson plan" pilot districts are**19%** above non pilot districts.

  Question2: "Can the stated objectives be attained in a lesson" Pilot districts are **21%** above non pilot districts.

  Question3: "Are the stated objectives measurable" Pilot districts **20%** above non pilot districts.

  Question4: "Were the lesson objectives told to the students during the lesson" Pilot districts **14%** above non pilot districts.

  Question5: "In a lesson, did the students find core contents or concepts by themselves" pilot districts **15%** above Non pilot districts.

  Question6: "Was there time for evaluating or confirming what the students had learned" pilot districts **5%** above non pilot districts.

  Question7: "Did most of the students attain lesson objectives" Pilot districts **16%** above Non pilot districts.

- **F2: Lesson progression**

  Question1: "Did the introductory part of the lesson motivate students well" Pilot districts **10%** above non pilot districts.

  Question2: "Did the teacher ask the students to hypothesize a solution before instructing them to have an activity or experiment" non pilot districts **8%** more than pilot districts.

  Question3: "There was a presentation by students after an activity" Pilot districts **21%** above pilot districts.

  Question4: "There was a discussion among students to find answers or better solutions to the given task" Pilot districts **22%** above non pilot districts.

  Question5: "The teacher intended to confirm scientific concept or values in the process of teaching" Pilot districts **4%** above non pilot districts.

  Question6: "Both the teacher and the students were able to conclude what they had learned in a lesson" non pilot districts **4%** more than Pilot districts.

- **F: Teaching materials**

  Question1: "Did the teacher use any kind of teaching materials apart from blackboard and chalk" Pilot districts **32%** above non pilot districts.

  Question2: "Teaching materials were prepared properly before the lesson" Pilot districts **31%** above non pilot districts.

  Question3: "The teacher used improvised or locally available teaching materials in a lesson" pilot districts **32%** above non pilot districts.

  Question4: "The students were able to use or understand the prepared teaching materials" Pilot districts **35%** above non pilot districts.

  Question5: "Teaching materials used in a lesson enhanced students' understandings" Pilot districts **33%** above non pilot districts.

5.1.6. Conclusion

From this analysis, it is clear that more improvements in the quality of lessons taught have been recorded by Pilot districts where lesson study has been implemented for a longer period than in non pilot districts. In Factor3, for instance, which deals with use of teaching materials, the change is an impressive 32%. This shift is a powerful incentive to forge a head and expand this Approach. Teachers are making the required paradigm shift and with time, Activity based teaching and Problem Solving Approach (PSA) will become the norm rather than the exception in all Zambian Schools

5.2. Results on the Questionnaires for Pupils

5.2.1. Results on the Questionnaires for Pupils in Pilot Districts

The collected data on the Pupils' questionnaire were encoded into calculation sheet and was categorized into 8 factors related to the teaching of Science by teachers. Table 5 shows average points for respective factors in the analysis.

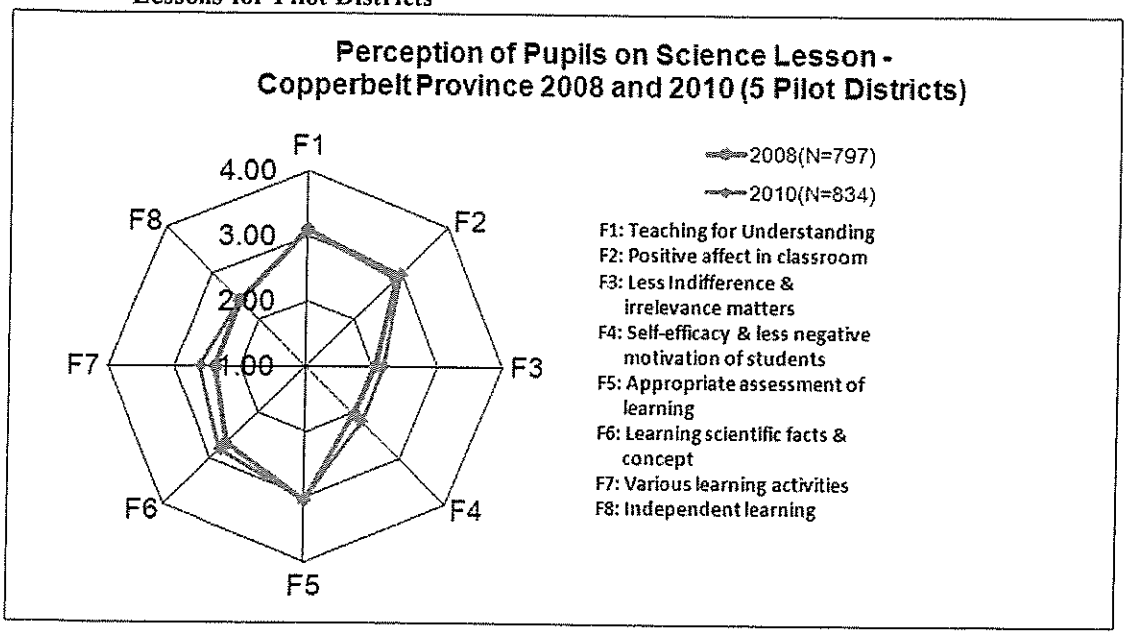
Table 5: Comparison between Baseline and Endline on the Perception of Pupils on Science Lessons for the five (5) Pilot Districts (Mufurila, Kitwe, Kalulushi, Ndola and Luanshya)

(Point: Max4, Min0)

Analysis Factors	2008 (N=797)	2010 (N=834)	Difference in
F1:Teaching for Understanding	3.09	3.10	0.02
F2:Positive affect in classroom	2.89	2.99	0.11
F3:Less indifference & irrelevance matters	2.04	2.17	0.13

F4:Self-efficacy & less negative motivation of students	2.04	2.19	0.15
F5:Appropriate assessment of learning	3.07	3.06	-0.01
F6:Learning scientific facts & concepts	2.68	2.80	0.12
F7:Various learning activities	2.35	2.60	0.24
F8:Independent learning	2.42	2.42	0.00

Figure 4: Comparison between Baseline and Endline on the Perception of Pupils on Science Lessons for Pilot Districts



Comparison between 2008 and 2010 on the Perception of Pupils on Science Lessons
Refer to Table 5 and Figure 3.

- There is a small improvement on F7:Various learning activities of 0.24 point
- Slight improvement on F3: Less indifference & irrelevance matters of 0.13 point
- F4: Self-efficacy & less negative motivation of students improved by 0.15 point
- F1: Positive effectiveness in classroom improved by 0.02 point
- F2: Teaching for understanding of about had the smallest improvement of 0.11 point
- F5: Appropriate assessment of learning has gone down by 0.01
- Factor 8 was constant and that means that pupils feel that there is still no independent learning allowed by their teachers in class or outside

5.2.2. Conclusion:

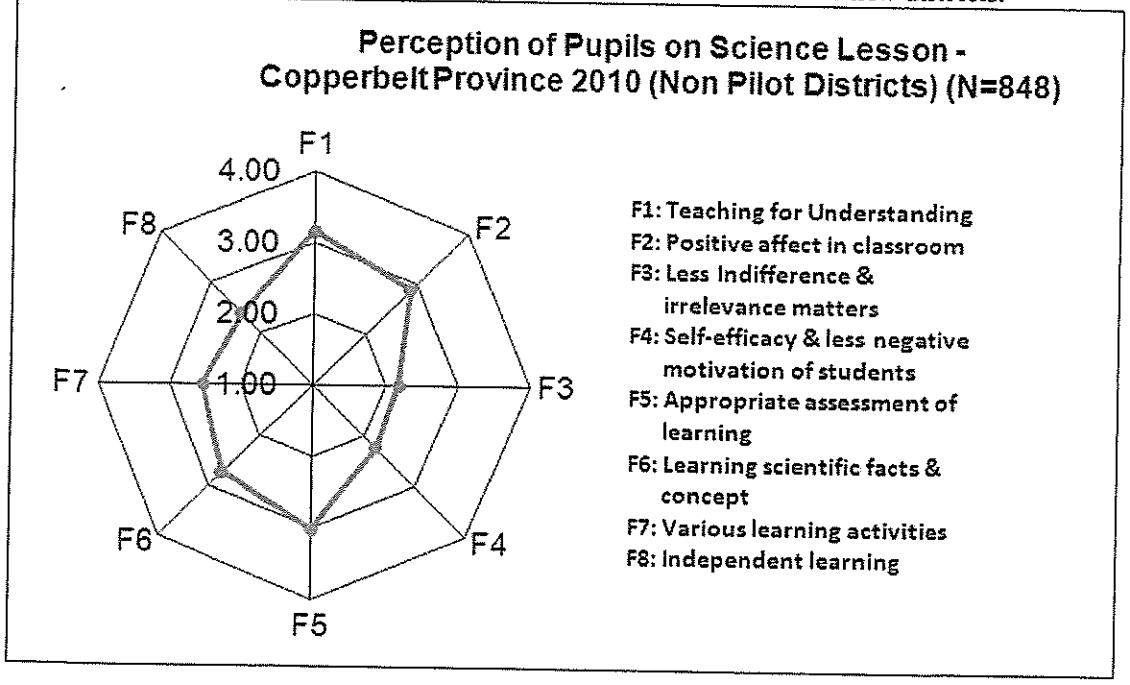
The overall picture is that there isn't much significant change in the pupils' perception on their science lessons. It is difficult, how ever, to assign reasons to this lack of shift in the way pupils view their science lessons after 2years of implementing Lesson Study. What is good though is the fact that positive perceptions, though minute, are recorded in all the 8 factors.

5.2.3. Results on the Questionnaires for Pupils in Non Pilot Districts.

Table 6: Perception of Pupils on Science Lessons for the five (5) non pilot Districts (Mpongwe, Lufwanyama, Chingola, Chililabobwe and Masaiti) (Point: Max4, Min0)

Analysis Factors	2010 (N=848)	%
F1:Teaching for Understanding	3.15	79%
F2:Positive affect in classroom	2.90	72%
F3:Less indifference & irrelevance matters	2.19	55%
F4:Self-efficacy & less negative motivation of students	2.24	56%
F5:Appropriate assessment of learning	3.03	76%
F6:Learning scientific facts & concepts	2.74	69%
F7:Various learning activities	2.51	63%
F8:Independent learning	2.38	60%

Figure 5: Perception of Pupils on Science Lessons for the five new districts.



From the Table 6 and Figure 5 we concluded the following:

- Teaching for Understanding (F1) scored 79% and this shows that the program is working
- Positive effectiveness in classroom (F2) is also been achieved at 72%
- There is little difficult in achieving less indifference & irrelevance matters (F3) with a score of 55%.
- Self-efficacy & less negative motivation of students (F4), not doing well at 56%
- Appropriate assessment of learning (F5) is been achieved at 76%.
- Learning scientific facts & concepts (F6), not so well at 69%.
- Various learning activities (F7), not so well at 63%.
- Independent learning (F8), not doing well at 60%.

5.2.4. Conclusion:

Ironically, pupils' perception of Science Lessons in the new districts where Lesson Study has been implemented for a shorter period are fairly good percentage wise. One reason for this could be that many Districts on the Copperbelt took the initiative to commence Lesson Study Activities long before being officially co opted into the Program. The lack of baseline data to compare with is also a hindrance for us to make any stringent comparisons.

5.3 Result of Questionnaires to School Managers and Teachers

5.3.1. Result of Questionnaires to Teachers- Pilot Districts

Table 6 shows the result of the teachers' perception on the implementation of the SMASTE-SBCPD. The questionnaire measured the extent to which they agreed with the given statement.

Table 7: Result of Questionnaire to Teachers (N=53)

Questions	Average
1. I often participate in workshops and trainings for teachers.	4.14
2. I think teachers have to continue learning, even after we leave college.	4.72
3. I need more skills and updated information on teaching.	4.46
4. It's good that lesson study activities have been introduced in our school under SMASTE program.	4.62
5. SMASTE-CPD program .aims to improve knowledge & skills of teachers through lessons study as school CPD. I think this objective is appropriate to the teachers.	4.62
6. Our school has an activity plan for SMASTE activities including lesson demonstrations.	4.55
7. The SMASTE facilitator assigned to my school or zone is doing good job.	4.33
8. I was given an opportunity to participate in the CPD meetings conducted by the SMASTE facilitator.	3.33
9. I have adequate apparatus/equipment for teaching.	3.88
10. I was oriented by facilitator / school managers on how to conduct lesson study at school.	4.47
11. I appreciate that the SMASTE activities have been introduced at school level.	4.23
12. Our school head and deputy head are supportive to lesson study activities of teachers.	4.48
13. I always get new idea or skill from lesson study activities at school.	4.31
14. We are following 8 steps of lesson study activities at school.	4.18
15. Our school head and deputy often give us useful comments and suggestions for improvement of teaching.	4.12
16. I became confident in teaching through activities under SMASTE program.	4.36
17. I now spend more time for preparing my lessons.	4.38

18. I feel that the team work of our teachers was strengthened through this program.	4.25
19. I wish that lesson study activities would be continued next year.	4.47
20. I believe that the framework of SMASTE-CPD program can work if taken to other schools and provinces.	4.91

Scale: 1-Strongly Disagree; 2-Disagree; 3-Neither Disagree nor Agree; 4-Agree; 5-Strongly Agree

5.3.2. Result of Questionnaires to School Managers - Pilot Districts

Table 6 shows the result of the school managers' perception on the implementation of the SMASTE-SBCPD. The questionnaire measured the extent to which they agreed with the given statement.

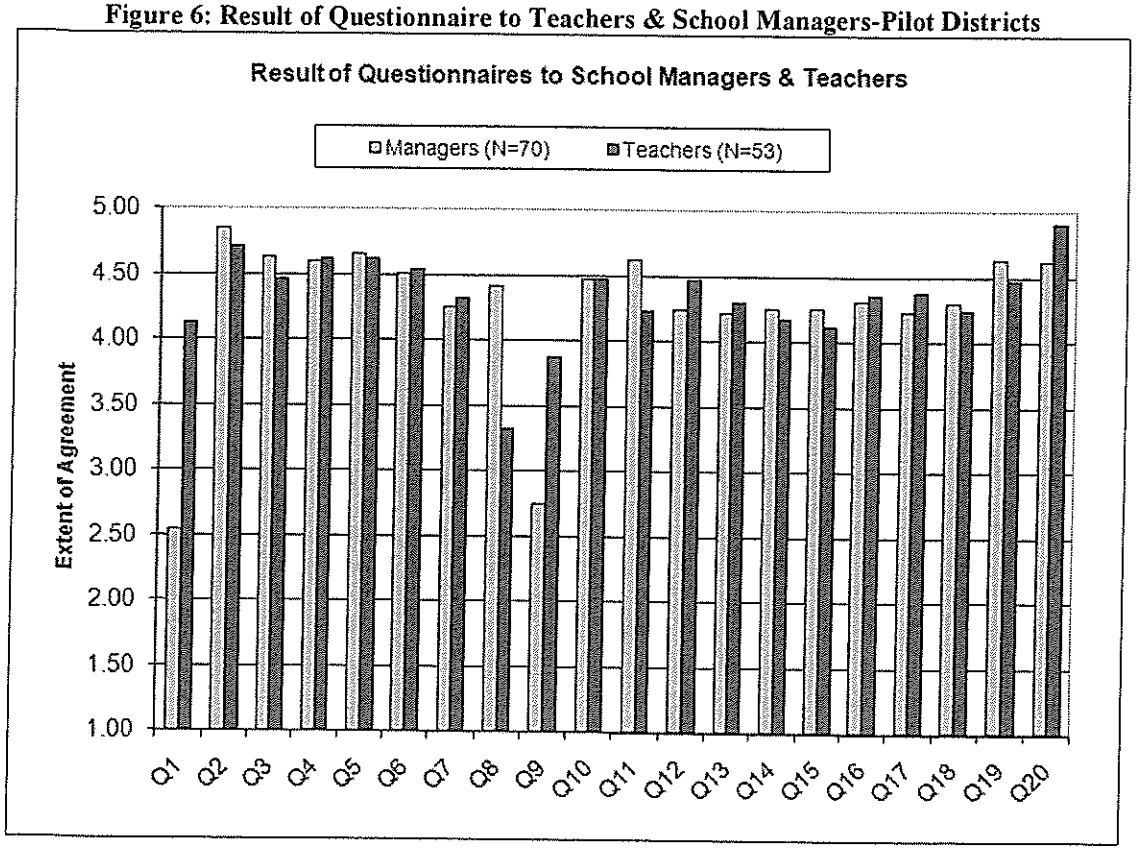
Table 8: Result of Questionnaire to School Managers (N=70)

Questions	Average
1. Teachers in my school often participate in workshops and trainings for the improvement of teaching.	2.55
2. Teachers have to continue learning, even after they become teachers.	4.86
3. Teachers in my school need more skills and updated information on teaching.	4.64
4. It's good that lesson study activities have been introduced in our school under SMASTE program.	4.60
5. SMASTE-CPD program .aims to improve knowledge & skills of teachers through lessons study as school CPD. I think this objective is appropriate to the teachers.	4.66
6. Our school has an activity plan for SMASTE activities including lesson demonstrations.	4.51
7. The SMASTE facilitator assigned to my school or zone is doing good job.	4.26
8. In our school, an opportunity has been provided for teachers to participate in the CPD meetings conducted by the SMASTE facilitator.	4.41
9. We have adequate apparatus/equipment for teaching.	2.76
10. We have conducted an orientation on how to conduct lesson study at school.	4.47
11. I appreciate that SMASTE activities have been introduced at school level.	4.63
12. Teachers in my school are cooperative in conducting lesson study activities.	4.24
13. Teachers in my school always get new idea or skill from lesson study activities at school.	4.23
14. We are following 8 steps of lesson study activities at school.	4.26
15. In lesson study activities, I often give comments and suggestions for improvement of teaching to the teachers.	4.26
16. Teachers in my school became confident in teaching through activities under SMASTE program.	4.31

17. Teachers in my school now spend more time for preparing their lessons.	4.24
18. I feel that the team work of our teachers was strengthened through this program.	4.30
19. I wish that lesson study activities would be continued next year.	4.64
20. I believe that the framework of SMASTE-CPD program can work if taken to other schools and provinces.	4.63

Scale: 1-Strongly Disagree, 2-Disagree, 3-Neither Disagree nor Agree, 4-Agree, 5-Strongly Agree

Figure 6: Result of Questionnaire to Teachers & School Managers-Pilot Districts



5.3.3 Comparison of extent of agreement between teachers and head teachers on SBCDPD implementation in schools as seen in above graph-pilot districts

The graph above shows the extent of agreement with the statements in the questionnaires.
Question 10 shows an agreement between Managers and teachers that orientations on how to conduct lesson study activity were conducted at their schools.
Question 1, 8, and 9, shows disparities between teachers and managers
On **Question 1**, teachers are agreeing that they often participate in workshops and training while managers are almost disagreeing.
Question 8 managers are agreeing that there are opportunities for teachers to participate in CPD meetings whiles teachers are not agreeing,
Question 9 shows that teachers are agreeing that they have adequate apparatus/equipment for teaching while managers are disagreeing. **Question 11 and 20** also show minor disparities, while on the rest the managers and teachers are almost agreeing that lesson study activities are being conducted at their schools and should be encouraged.

5.3.4. Result of Questionnaires to Teachers - Non Pilot Districts

Table 9: Result of Questionnaire to Teachers (N=117) - Non Pilot Districts.

Questions	Average
1. I often participate in workshops and trainings for teachers.	2.51
2. I think teachers have to continue learning, even after we leave college.	4.77
3. I need more skills and updated information on teaching.	4.44
4. It's good that lesson study activities have been introduced in our school under SMASTE program.	4.18
5. SMASTE-CPD program .aims to improve knowledge & skills of teachers through lessons study as school CPD. I think this objective is appropriate to the teachers.	4.32
6. Our school has an activity plan for SMASTE activities including lesson demonstrations.	4.20
7. The SMASTE facilitator assigned to my school or zone is doing good job.	3.79
8. I was given an opportunity to participate in the CPD meetings conducted by the SMASTE facilitator.	3.91
9. I have adequate apparatus/equipment for teaching.	2.65
10. I was oriented by facilitator / school managers on how to conduct lesson study at school.	3.94
11. I appreciate that the SMASTE activities have been introduced at school level.	4.16
12. Our school head and deputy head are supportive to lesson study activities of teachers.	4.35
13. I always get new idea or skill from lesson study activities at school.	4.10
14. We are following 8 steps of lesson study activities at school.	3.80
15. Our school head and deputy often give us useful comments and suggestions for improvement of teaching.	4.15
16. I became confident in teaching through activities under SMASTE program.	3.58
17. I now spend more time for preparing my lessons.	4.21
18. I feel that the team work of our teachers was strengthened through this program.	4.03
19. I wish that lesson study activities would be continued next year.	4.16
20. I believe that the framework of SMASTE-CPD program can work if taken to other schools and provinces.	4.17

Scale: 1-Strongly Disagree, 2-Disagree, 3-Neither Disagree nor Agree, 4-Agree, 5-Strongly Agree

5.3.5. Result of Questionnaires to School Managers - Non Pilot Districts

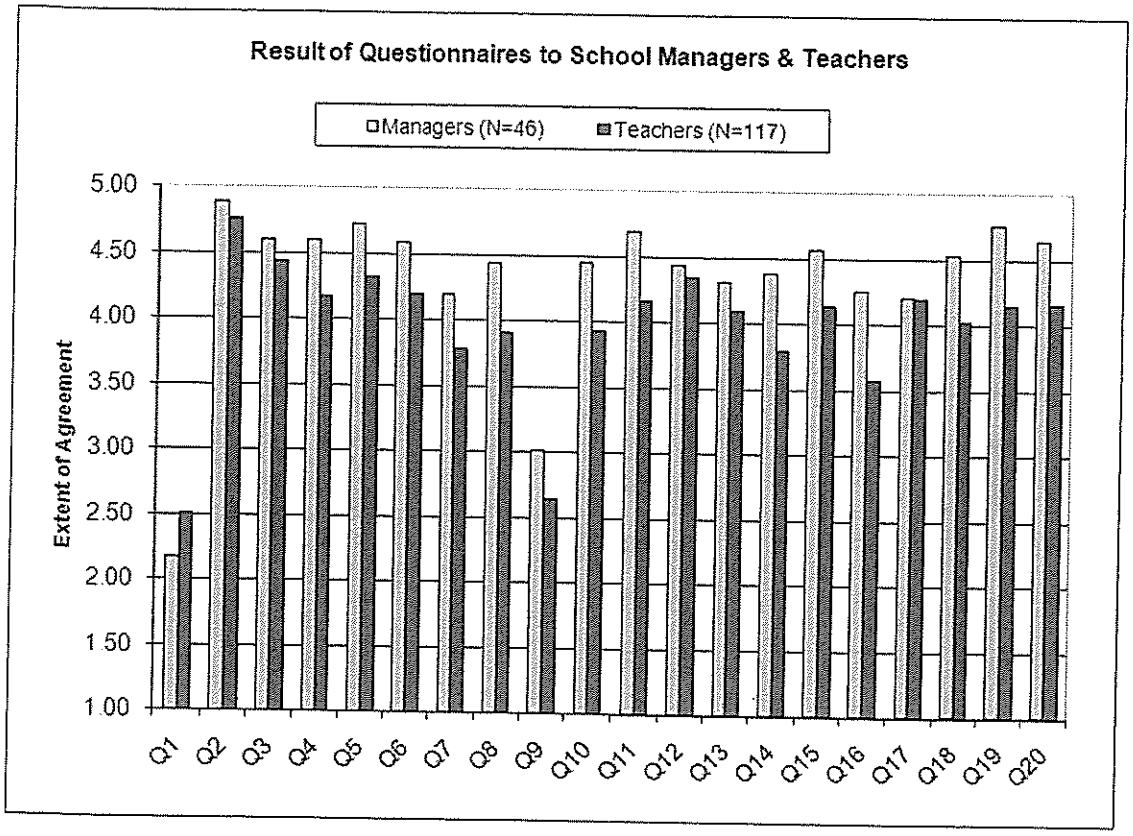
Table 10: Result of Questionnaire to School Managers (N=46) - Non Pilot Districts

Questions	Average
1. Teachers in my school often participate in workshops and trainings for the improvement of teaching.	2.51
2. Teachers have to continue learning, even after they become teachers.	4.77

3. Teachers in my school need more skills and updated information on teaching.	4.44
4. It's good that lesson study activities have been introduced in our school under SMASTE program.	4.18
5. SMASTE-CPD program .aims to improve knowledge & skills of teachers through lessons study as school CPD. I think this objective is appropriate to the teachers.	4.32
6. Our school has an activity plan for SMASTE activities including lesson demonstrations.	4.20
7. The SMASTE facilitator assigned to my school or zone is doing good job.	3.79
8. In our school, an opportunity has been provided for teachers to participate in the CPD meetings conducted by the SMASTE facilitator.	3.91
9. We have adequate apparatus/equipment for teaching.	2.65
10. We have conducted an orientation on how to conduct lesson study at school.	3.94
11. I appreciate that SMASTE activities have been introduced at school level.	4.16
12. Teachers in my school are cooperative in conducting lesson study activities.	4.35
13. Teachers in my school always get new idea or skill from lesson study activities at school.	4.10
14. We are following 8 steps of lesson study activities at school.	3.80
15. In lesson study activities, I often give comments and suggestions for improvement of teaching to the teachers.	4.15
16. Teachers in my school became confident in teaching through activities under SMASTE program.	3.58
17. Teachers in my school now spend more time for preparing their lessons.	4.21
18. I feel that the team work of our teachers was strengthened through this program.	4.03
19. I wish that lesson study activities would be continued next year.	4.16
20. I believe that the framework of SMASTE-CPD program can work if taken to other schools and provinces.	4.17

Scale: 1-Strongly Disagree, 2-Disagree, 3-Neither Disagree nor Agree, 4-Agree, 5-Strongly Agree

Figure 7: Result of Questionnaire to Teachers & School Managers - Non Pilot Districts



The Bar Chart above shows a comparison on extent of agreement with the statements in questionnaires by Heads and ordinary teachers for non Pilot Districts. In this instance, there are a lot of disparities with most of the statements in the questionnaires except for **Question 17** where both managers and teachers are agreeing that teachers are now spending more time in preparing their lessons. The high level of disagreement between teachers and managers in the new Districts compared to the Piloting ones is indicative of the harmonizing nature of the approach once Stakeholders realize its full benefits.

6. CONCLUSION

On the whole, the data analysis above shows that, on the Copperbelt, there has been a marked improvement in the way teachers conduct lessons in the classrooms. The emphasis on collaborative planning and on activity based teaching has enhanced good research skills among both teachers and pupils. Lesson Study activities have also brought positive competition amongst teachers, there by improving the quality of lessons delivered in classrooms.

Pupil's Participation in discussions and experiments during lessons and after is helping in developing a scientific culture in learners. Through the now more common pupil lesson evaluation process, learners are increasing challenging the methods teachers employ and making them adopt more learners Centered approaches.

The comparison between Baseline and Endline survey results and those between Pilot and non pilot districts confirm that School based CPD through lesson study is a workable and highly beneficial program. However, more time and other resources are needed to help pin point other benefits of Lesson Study and to ensure sustainability of the program.

7.0 LIST OF TEACHERS WHO WHERE SAMPLED AND LESSONS THEY TAUGHT

District	School	Subject	Grade	Topic	Teacher	TS No.
Chililabombwe	CHL HIG	CHEMISTRY	10	SEPERATION TEC	Mr.Chola	
	CHIL HIGH	MATHS	10 T	MENSURATION	A. Walumba	67808
	MIT HIGH	PHYSICS	10 C	VOLUME	K Mulenga	806355
	MUL HIIGH	MATHS	10D	SETS	Kabwe C	
	MUL HIGH	BIOLOGY	11 B	CLASSIFICATION	B mazuba	
	KAM BASIC	MATHS	8 G	ALGEBRA	Jeremani K	601947
	KAM BASIC	SCIENCE	8 F	DENSITY	Musukwa J	18780
	MINGOMBA	MATHS	9A	ERITHMETIC	Mumba E	806294
	MINGOMBA	E SCIENCE	9A	AIR	K Malama	602134
	LUB BASIC	SCIENCE	8A	LIGHT	T Namulonda	69571
	MIT HIGH	MATHS	12	SEQUENCES	Chulabantu m	
	CHIL	MATHS		ALGEBRA	Mutambo E	604249
	CHIL	E SCIENCE		DENSITY	Lameck M	606483
	TWAFWANE	E SCIENCE	8C	HEAT	Gondwe E	604590
	TWAFWANE	MATHS	9B	ALGEBRA	Bwanali	806352
Chingola	MATEL	Ev Sci	8	Inter Comb Eng	Muunyu	
	MATEL	Env Science	9G	Starch Production in plants	Siputula	69795
	TWATA	Maths	8C	Letters for #	Kalimwengo	602687
	TWATA	Maths	8A	Algebra	Nayame	
	TWATA	English	8A	Discussion	Mwansa	603840
	TWATA	English	9A	Describibg people	Chitalu	603839
	KABU	Ev Scie	8A	Density	Mwewa	603083
	KABU	Biology	11	Blood groups	Sibanyama	806923
	KABU	Home Eco	11R	Home Mgt	Mulenga	55490
	TWATE	Maths	11	Measuration	Mwansa	95169
	TWATE	Maths	9	Angles	Manda	73270
	TWATE	Home Eco	9C	Cooking	Mulenga	600820
	MAITE	Ev Scie	9	Light	Musonda	600039
	MAITE	Biology	11C	Transport	Chisha	
	MAITE	Food & Nutrition	10B	Vitamins	Kayoya	66906
	MAITE	Maths	10A	Linear Inequations	Mtambo	800617
	FAITH	Chemistry	10E	Separetion Tec	Chibamba	607003
	FAITH	Maths	10	Simulteneous Eq	Sinkala	
	SEKELA	Biology	11	Reproduction	Chomba	
	SEKELA	Chemistry	10b	Atomic Structure	Chishiba	804162
	CHING HIG	Biology	10	Photosynthesis	Kasanda	582213
	CHING HIG	Home Eco	10G	House Keepng	Akapelwa	806262
	CHING HIG	RE	12H	Marriage Partner	Kasonde	806343
	CHING HIG	Maths	10B	Indices	Chuulu	601588
	CHING HIG	Physics	11C	Pulleys	Kumwenda	803241
	CHING HIG	Physics	12B	Light	Phiri	804163
	CHIK	Comme	12G	Insurance	Katete	803350
	CHIK	Woodwork	10C	Seasoning	Kabanga	68472
	CHIN	Maths	11I	Circle Geometry	Mubanga	805039
	CHIN	Maths	10C	Estimation	Ndhlovu	604435
	CHIN	Maths	11J	Quadratic Eq	Simukoko	602735
	CHIN	Physics	11A	Revision	Malata	804237
	CHIN	Chemistry	10A	Atomic Mass	Chanda	803236
	CHIN	Biology	11E	Transport in plants	Chishiba	804127
Mpongwe	KAS	E SCIENCE	8	Density	Fwelu K	73539
	MPO BASIC	E SCIENCE	8C	Density	Kunsensela M	606269
	MPO HIGH	CHEMISTRY	11 N		Kaunda M	601906
	M PO HIGH	PHYSICS	11 E	Kinetic	Mkandawire R	600489
	IBENGA	BIOLOGY	11B	The Heart	Mazimba	804368
	IBENGA	PHYSICS	10A	Velocity	Tembo M	600366
	MPO HIGH	A SCIENCE	12 N	Farm Stractures	Chate A M	85805
	MPO HIGH	CHEMISTRY	10G	Covalent Bond	Mulenga R C	601214

District	School	Subject	Grade	Topic	Teacher	TS No.
Masaiti	Lumanno	Ev Scie	9A	Plant Cell	Livingi	600642
	Chamu	Ev Scie	8A	Density & Floatation	Mununga	600414
	Kaful	Biology	11B	Tropisms	Chinanda	69771
	Chiw	Physics	10	Motion	Chilufya	89979
	Chiw	Chemistry	11B	Bases	Broyda	802048
	Mas	Ev Scie	9B	Electricty	Mukuka	18402
Lufwanyama	St. Joseph	Maths	9C	Perimeter	Kikulukumbwa	606080
	St. Joseph	Maths	9A	Pytha. Theorem	Mwandama	600811
	Milopa	Science	9	Electricty	Komwedo	605710
	Milopa	Maths	8	Approximations	Mutale	606292
	Kalumbwa	Physics	11C	Force	Mukungule	801754
	Kalumbwa	Biology	11	Circulation System	Chitembo	603664
	Kalumbwa	Biology	12	Locomotion	Moyo	600422
	Kalumbwa	Maths	10A	Perpendicular Line	Malasa	802588
	Kalumbwa	Maths	11B	Tangent of the angle	Mwanza	601999
	Mibenge	Agri. Sc	8	Crop husbandly	Siame	603731
	Mibenge	Maths	9B	Algebra	Mwanza	604352
	Mibenge	Env. Sc	9A	Animal	Mwansa	602946
	St. Joseph	Chemistry	11	Bonding	Katongo	601876
	St. Joseph	Biology	10	Food Test	Chalikosa	600547
	Shimukunami	Maths	9A	Polygons	Gondwe	606619
	Shimukunami	Env.Sc	9B	Organs	Chambata	606879
	Shimukunami	Maths	8	Algebra	Simukonda	606263
	Shimukunami	Maths	8A	Division of Inte	Salama	602084
	Chapula	Env.Sc	8A	Electricty	Kapelo	604385
	Chapula	Maths	9	Standard Form	Mpounji	602029
	Nkana	Env. Sc	9A	Reproduction	Phiri	603725
	Nkana	Maths	8	% of Quantity	Sitali	602037
	Nkana	Maths	9B	Inverse Proportion	Nyondo	602026
Ndola	TEMW	Physics	10T	Time	Lukhele	
	NDEK	Biology	11A	Dentition	Shikabonga	606822
	FATI	Chemistry	11A	Stoichiometry	Zulu	803143
	MASA	Maths	11H	Arc	Laishi	85837
	KAMBA	Env. Sc	8K	Respiration	Katunga	26553
	CHIF A	Env. Sc	9C	Plants	Silanda	601296
	MALA	Env. Sc	9M	Food	Mabo	604097
	TEMW	Physics	10T	Time	Lukhere	
	MASALA	Physics	12A	Pulleys	Chibwe	803309
	MASALA	Chemistry	12N	Pre. Salts	Sitwala	805471
	MASALA	Physics	12A	Simp. Machines	Chibwe	803309
Luanshya	MPATAMATU	PHYSICS	12	Thermal	D. Bwani	85309
	MPATAMATU	CHEMISTRY	12B	P. Table	M kabaso	
	MPATAMATU	BIOLOGY	12	Nutrients	Katontoka l	600997
	NKUL HIGH	BIOLOGY	11	Food Test	Musuku	88961
	NKUL HIGH	CHEMISTRY	11	Chemicals	Y.D Komba	17428
	NKUL HIGH	PHYSICS	11	Simple machines	S Mugals	89179
	NKUL HIGH	BIOLOGY	10	Enzymes	J Munshya	54455
	NKUL HIGH	CHEMISTRY	10	Sublimation	S Malambo	606786
	MIPUNDU	E SCIENCE	9	Radio Co	Kulala	601568
	MIKOMFWA	E SCIENCE	9A	Lenses	M.M sakala	804573
	NKUL BASIC	E SCIENCE	8	Matter	N Phiri	
	NKUL BASIC	E SCIENCE	8B	Density	D Mutokane	
	KASAMA BASIC	E SCIENCE	8	Density	Sikanyika	
	ROAN ANT	BIOLOGY	12	Reproduction	R.C Kajimotu	69880
	KANSUMBI	E SCIENCE	9A	Dentition	N Nkumbu	602662
	MPELEMBE BASIC	E SCIENCE	8	Density	J M Chansa	96484
	NDELELA BASIC	SCIENCE	9	Electricity	L. Simukanzye	605035
	TWATEMWA BASIC	E SCIENCE	8T2	Plant cell	B.M Chita	601499
	TWATEMWA BASIC	MATHS	8T1	Fractions	S.B Lubinda	61535

District	School	Subject	Grade	Topic	Teacher	TS No.
Mufurila	PAMODZI	MATHS		E. Geometry	Mizinga	803291
	PAMODZI	MATHS	12 L	Transformation	I. Bweupe	
	PAMODZI	PHYSICS	11 L	Waves	M.a mayenge	804402
	BUYANTANSHI	E SCIENCE	9	Electricty	Mpalo	
	MUTUNDU	MATHS	9	Approx & Est	K.P kashiya	605202
	CHAKWA	CHEMISTRY	12A	Titration	S. Phiri	72848
	MUF BASIC	E SCIENCE	8F	Birds	L Sheleni	69449
	MUF BASIC	E.SCIENCE	8A	Thermal Transfer	N Katonga	600117
	MUF BASIC	E SCIENCE	9D	Seperation tec	D.K chikashi	69892
	MUTUNDU	E SCIENCE	9A	Transpiration	A Chisenga	602360
	TWASHUKA	MATHS	9B	Pythagoras	C.N Salati	602351
	IPUSUKILO	PHYSICS	10B	Measurements	S.M Monde	
	IPUSUKILO	PHYSICS	12C	Waves	Chileshe	
	KAM BASIC	E SCIENCE	9E	Plants	J zulu	94740
	KANTANSHI	MATHS	11B	Quadratic	K mulenga	806292
	KANTANSHI	CHEMISTRY	11B	Acids	Mwanza	803208
	KAM BASIC	E SCIENCE	8A	Respiration	C.D chikunyu	
	IPUSUKILO	BIOLOGY	12D	Excretion	Chibanga s	802609
	CHANKWA	BIOLOGY	12B	Food Tests	S.M changwe	
	MULEYA	MATHS	9B	Shapes	P. Chola	600008
	MULEYA	MATHS	8A	Decimal fra	Kalota Alex	400769
	TWAMPANE	MATHS	9	Bearings	A Matutu	602370
	TWAMPANE	MATHS	8	Coordinates	G Mwansa	95149
	TWAMPANE	SCIENCE	9A	New Life	Mulenga S	605123
	KALANGA	MATHS	8	Integers	Kaimbi Betwin	71107
	KALANGA	E SCIENCE	8	Gases	K Zimba	580995
	TWASHUKA	E SCIENCE	8A	Plants	L.N Mukuka	602384
	TWAMPANE	SCIENCE	9B	Plants	R.C.Mbambara	69038
	MULEYA	E SCIENCE	9A	Mammals	Mwila	67650
	TAUNGUP	CHEMISTRY	11T	Bases	M. Mutale	804407
Kitwe	Mukuba	Physics	10A	Centre of Mass	Chimwando	802505
	Nkana	Chemistry	10N	Dilution	Musumbulwa	602588
	Chimwemwe	Chemistry	12B	Extraction	Mwanza	
	Nkana	Chemistry	10	Dilution		
	Chibote	Physics	12A	Electricty	Sakala	
	Garnatone	Maths	9A	Squares	Mulenga	94197
	Mindolo	Env.Sc	8E	Expansion & Heat	Muwowo	186281
	Rokana	Env. Sc	9C	Birds egg	Kankunga	804306
	Buntungwa	Env.Sc	9C	An. Cooling	Chilala	604397
	Buntungwa	Env.Sc	9C	An. Cooling	Chilala	604397
	Kitwe	Chemistry	11L	Indicators	Mwewnya	602635
	Kitwe	Chemistry	11K	Indicators	Mwewnya	602635
	Mindolo	Physics	12B	Electricty	Kalungu	804269
	Natwange	Env. Sc	9	Light	Chisenga	602504
	Hellen Kaunda	Biology	11W	Abs & Trasp of H2O	Kaira	85834
	Kamitondo	Env. Sc	9T	Birds egg	Chamangwa	68933
	Mitanto	Chemistry	10	Symbols	Libati	806364
	Kabwe	Env. Sc	9F	Reflection of rays	Mpola	601912
	Ndeke	Biology	11I	Vitamin B1,B2 & B12	Sikanyika	85522
	Ndeke	Env. Sc	8E	Heating Solids, Liq & Gas	Bweupe	67325
	Wusakile	Physics	12	Electricty	Banda	
	Kamfinsa	Chemistry	12B	Acids	Zimba	803189
	Kafue	Env. Sc	9	Light	Musoka	68377
	Mweeka	Env.Sc	8	Air	Daka	501272
	Ipusukilo	Env. Sc		Radio Communication	Kayuwa	602549

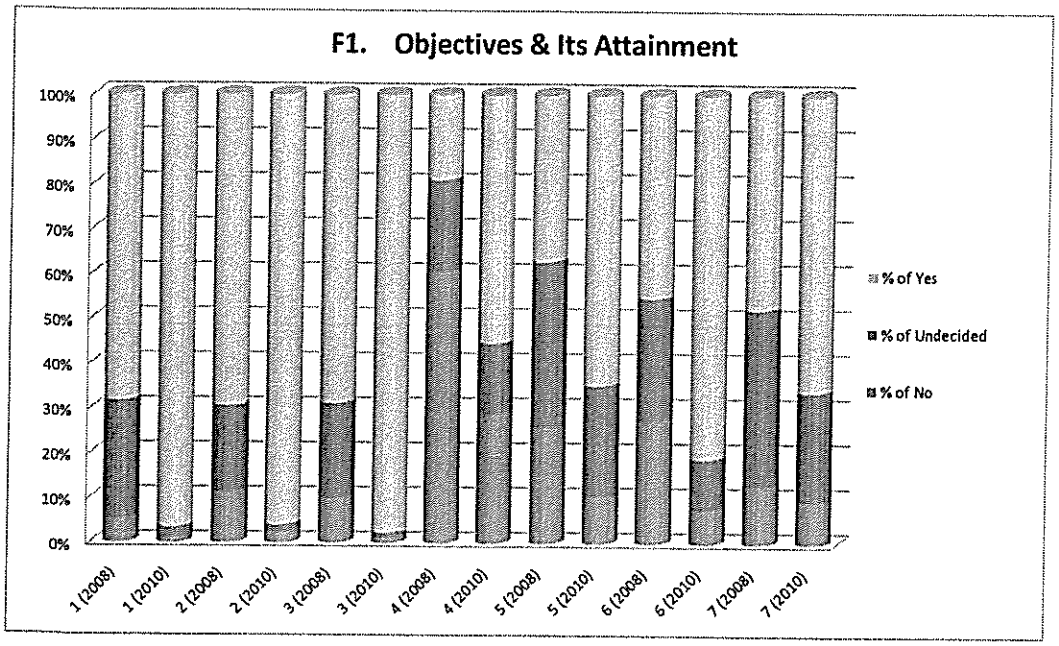
District	School	Subject	Grade	Topic	Teacher	TS No.
Kalulushi	ST MARCELLINS	CHEHISTRY	10A	Elements	Mukuka	606987
	ST MARCELLINS	BIOLOGY	10C	Food test	Banda	
	KAL HIGH	BIOLOGY	11H	Digestion	Ihola L	803180
	KAL HIGH	CHEMISTRY		Chemical Changes	Y Nyalungwe	
	CHAVUMA HIGH	BIOLOGY	12	Coordination	L.M Kaunda	53860
	CHAVUMA HIGH	CHEMISTRY	12C	Acids	Nguni	
	CHATI HIGH	BIOLOGY	12B	Drugs	Kavungu C	803294
	CHATI	CHEMISTRY	12A	Water Polution	Nambula	803253
	CHAMBISH HIGH	CHEMISTRY	12A	Redox	M Kabeta	804175
	CHAMBISH HIGH	PHYSICS	11	Movements	B Mukanda	
	TWALUBUKA	E SCIENCE		Sunlight		
	MITOBO BASIC	E SCIENCE	9A		C Kabinda	603107
	MASAMBA BASIC	E SCIENCE	9A	Spectrum	B Hambani	600913
	LUKOSHI BASIC	E SCIENCE	9	Mammals	Mumba A	
	KAL HIGH	E SCIENCE	9B	Food Test	M Mvula	56512
	FIBALE BASIC	E SCIENCE	9A	Light	J Puta	603907
	LUBUTU BASIC	E SCIENCE	9	Voltage & Current	Mwanamwambwa L	602231
	KANKOSHI BASIC	E SCIENCE	9A	Seperation Tec	G.F Mamunye	67798
	KAFUBU DEPOT	E SCIENCE	9A	Heat	Machobani M	602287
	ICHIMPE BASIC	E SCIENCE	9	Birds	Musonda	
	CHIBOTE BASIC	E SCIENCE	9	Filtration	Mofya	
	CHEMBE BASIC	E SCIENCE	8A	A Plant	Mwelwa J	602157
	CHIBULUMA BASIC	E SCIENCE	9C	Mammals	A Nalumbwe	602278
	CHAVUMA BASIC	E SCIENCE	8B			
	CHAMBISHI BASIC	E SCIENCE	9B	Refraction	F Mpundu	806677

The list above does not include 10 teachers who did not write their names on the lesson observation instrument.

Result of Supplementary Analysis of Lesson Observation　(Northwestern Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

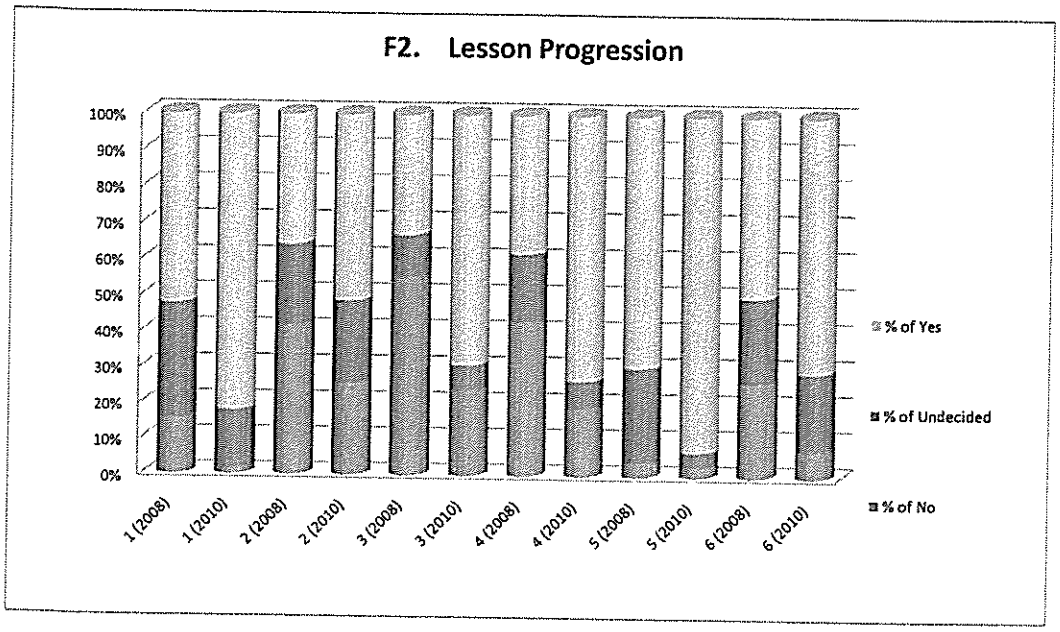
Year	2008	2010
Total # of observations (excl.missing data)	170	168

F1. Objectives & Its Attainment		Year	N	% of No	% of Undecided	% of Yes
1	Are the lesson objectives clearly stated in the lesson plan?	1 (2008)	170	5%	26%	68%
		1 (2010)	172	1%	2%	97%
2	Can the stated objectives be attained in a lesson?	2 (2008)	170	11%	19%	69%
		2 (2010)	170	2%	2%	96%
3	Are the stated objectives measurable?	3 (2008)	170	10%	21%	69%
		3 (2010)	170	1%	1%	98%
4	Were the lesson objectives told to the students during the lesson?	4 (2008)	170	61%	21%	19%
		4 (2010)	170	29%	16%	55%
5	In a lesson, did the students find core contens or concept by themselves?	5 (2008)	170	26%	37%	37%
		5 (2010)	170	11%	25%	65%
6	Was there time for evaluating or confirming what the students had learned?	6 (2008)	168	27%	27%	45%
		6 (2010)	169	8%	11%	81%
7	Did most of the students attain lesson objectives?	7 (2008)	170	13%	39%	48%
		7 (2010)	168	10%	24%	66%



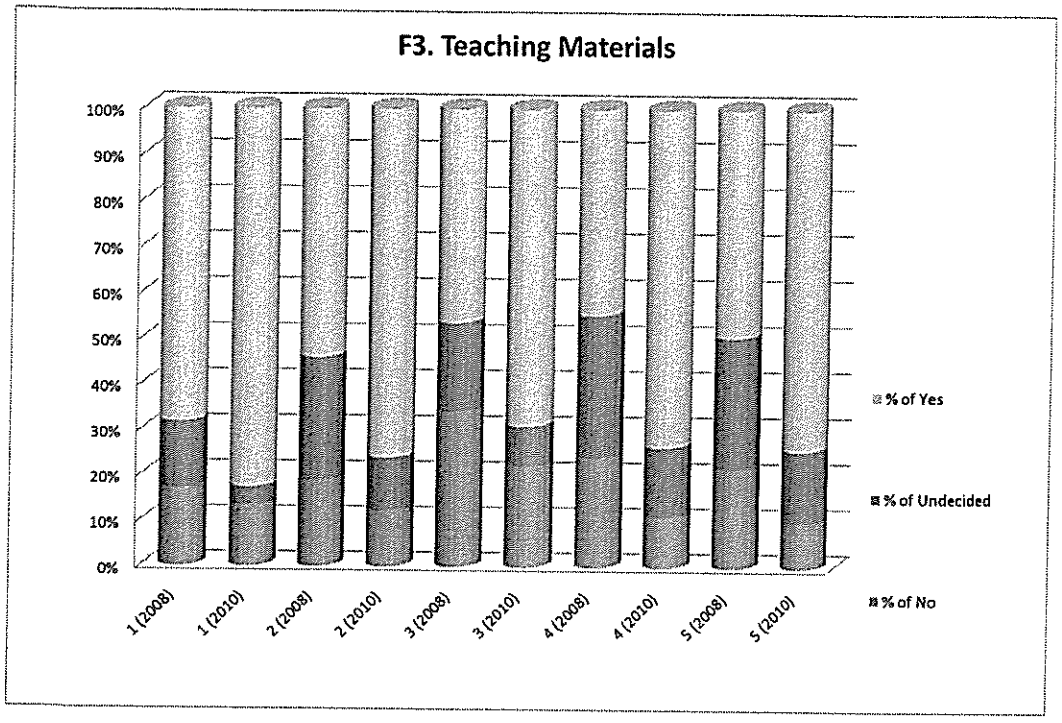
Result of Supplementary Analysis of Lesson Observation (Northwestern Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

F2.	Lesson Progression	Year	N	% of No	% of Undecided	% of Yes
1	Did the introductory part of the lesson motivate students well?	1 (2008)	168	15%	32%	52%
		1 (2010)	173	2%	16%	82%
2	Did the teacher ask the students to hypothesize a solution before instructing them to have an activity or experiment?	2 (2008)	170	42%	22%	36%
		2 (2010)	171	26%	23%	51%
3	There was a presentation by students after an activity.	3 (2008)	169	55%	12%	33%
		3 (2010)	172	24%	7%	69%
4	There was a disscusion among students to find answers or better solutions to the given task	4 (2008)	170	43%	19%	38%
		4 (2010)	173	19%	8%	73%
5	The teacher intended to confirm scientific concept or values in the process of teaching.	5 (2008)	169	4%	26%	69%
		5 (2010)	172	3%	4%	93%
6	Both the teacher and the students were able to conclude what they had learned in a lesson.	6 (2008)	170	26%	24%	50%
		6 (2010)	171	8%	22%	71%



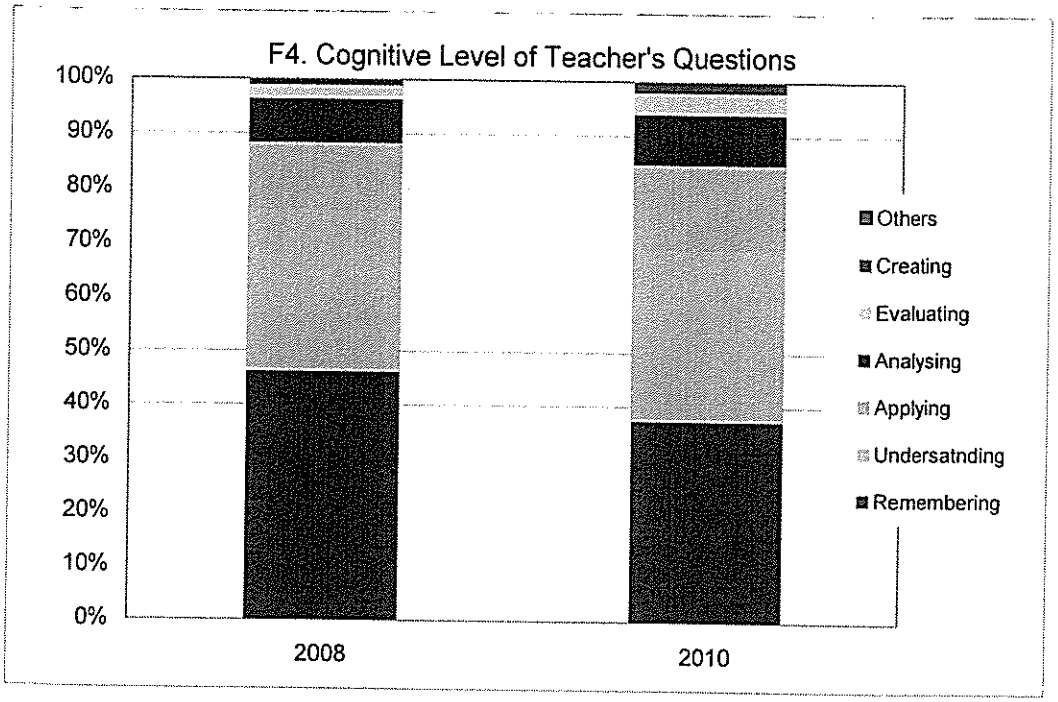
Result of Supplementary Analysis of Lesson Observation (Northwestern Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

F3.	Teaching Materials	Year	N	% of No	% of Undecided	% of Yes
1	Did the teacher use any kind of teaching materials apart from blackboard and chalk?	1 (2008)	170	17%	15%	68%
		1 (2010)	172	13%	4%	83%
2	Teaching materials were prepared properly before the lesson.	2 (2008)	170	19%	27%	54%
		2 (2010)	171	12%	12%	76%
3	The teacher used improvised or locally available teaching materials in a lesson.	3 (2008)	170	34%	19%	46%
		3 (2010)	171	22%	9%	69%
4	The students were able to use or understand the prepared teaching materials.	4 (2008)	170	24%	31%	45%
		4 (2010)	170	11%	15%	74%
5	Teaching materials used in a lesson enhanced students' understandings.	5 (2008)	170	22%	29%	49%
		5 (2010)	170	10%	16%	74%

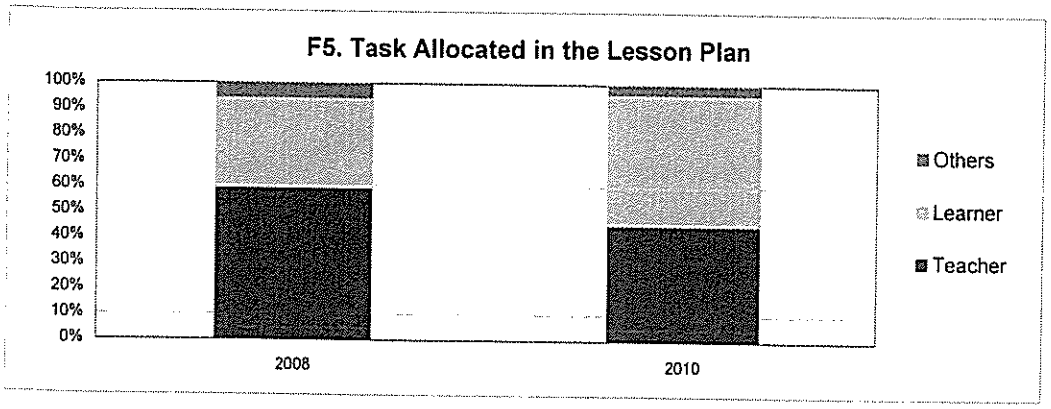


Result of Supplementary Analysis of Lesson Observation (Northwestern Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

F4. Cognitive level of teacher's question	2008 (N=170) %	2010 (N=168) %
Remembering	46.10	37.33
Undersatnding	29.68	31.83
Applying	12.51	15.57
Analysing	8.01	9.23
Evaluating	2.49	3.98
Creating	1.21	2.05
Others	0.00	0.01

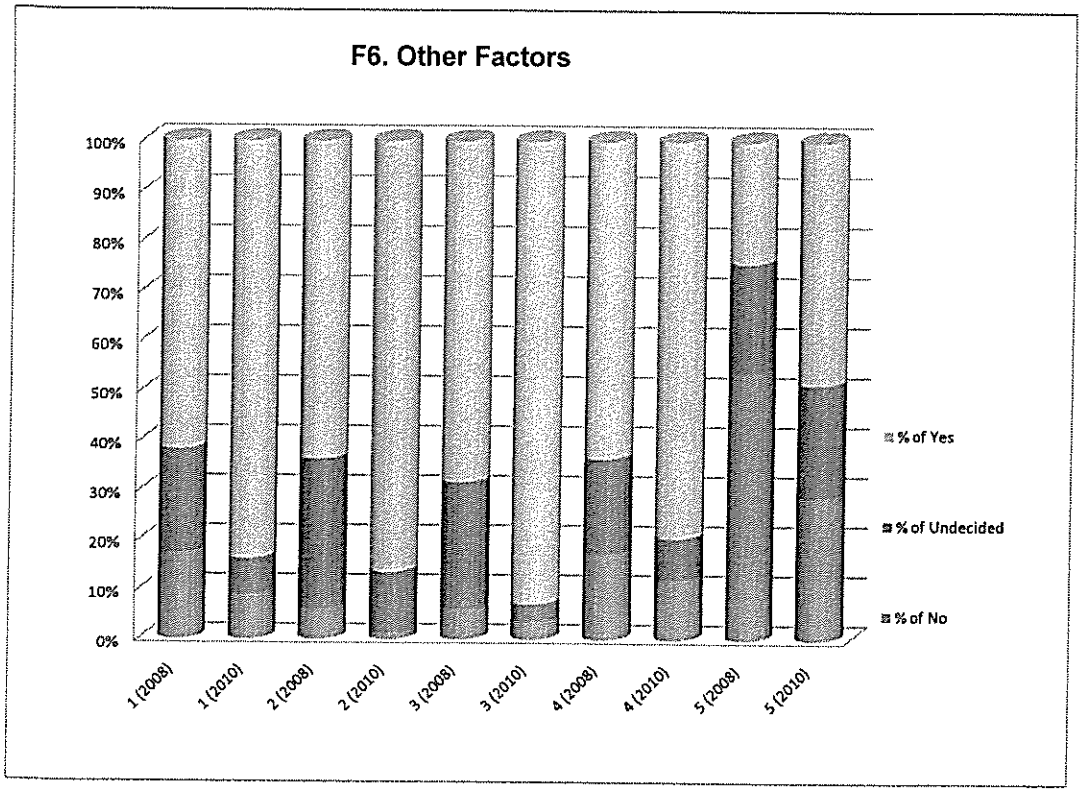


F5. Task Allocated in the Lesson Plan	2008 (N=170) %	2010 (N=168) %
Teacher	58.89	44.91
Learner	35.24	51.17
Others	5.88	3.91



Result of Supplementary Analysis of Lesson Observation (Northwestern Province)
Item by Item Comparison between 2008 (baseline) and 2010 (endline)

F6.	Other Factors	Year	N	% of No	% of Undecided	% of Yes
1	The teacher managed time well during lesson implementation.	1 (2008)	162	17.28%	20.99%	61.73%
		1 (2010)	167	8.98%	7.19%	83.83%
2	The teacher prepared for the lesson well.	2 (2008)	169	5.92%	30.18%	63.31%
		2 (2010)	169	1.18%	12.43%	86.39%
3	The teacher managed the blackboard well.	3 (2008)	168	5.95%	25.60%	67.86%
		3 (2010)	169	3.55%	3.55%	92.90%
4	The teacher gave enough attention to safety of learning environment.	4 (2008)	168	17.26%	19.05%	63.10%
		4 (2010)	166	12.05%	8.43%	79.52%
5	The teacher guided puplis on taking notes or recordes well.	5 (2008)	169	53.85%	21.89%	24.26%
		5 (2010)	167	28.74%	22.75%	48.50%



Report on the
End-line Survey of SMASTE-CPD Program

North Western Province

20th August 2010

Prepared by:
Provincial Education Support Team
North Western Province

Republic of Zambia
Ministry of Education
North Western Province
SMASTE Science School-based CPD Project

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ACCRONYMNS

CIPP	Context, Input, Process, Product
CDP	Continuing Professional Development
DEST	District Education Support Team
DRCC	District Resource Centre Coordinator
JICA	Japan International Cooperation Agency
SMASTE	Strengthening of Science, Mathematics and Technology Education
SMT	Science, mathematics and Technology
SPRINT	School Program of In-service for the Team
PRCC	Provincial Resource Centre Coordinator
PEO	Provincial Education Officer
PEST	Provincial Education Support Team

ACKNOWLEDGEMENT

We wish to render our gratitude to the JICA Technical Advisor for SMASTE-CPD, Ms. Asami Shimoda, Provincial Education Office and the North Western Province SMASTE-CPD Technical team.

Special thanks to Oliver Mukosa Bwalya and Richard Waana Mayondi, the Research Assistants who timely encoded, translated the data and also drafted the report.

1. INTRODUCTION

Ministry of Education and Japan International Co-operation Agency (JICA) agreed on the implementation of Strengthening of Mathematics, Science and Technology Education School Based Continuing Professional Development (SMASTE-SBCPD) as a Technical Cooperation Project. It was a 3 year pilot project in North Western Province to upgrade the knowledge and skills of science, mathematics and technology (teachers of science subjects as an entry point) using school-based SPRINT framework. The project started in February 2008 and will conclude in February 2011. It was introduced to High Schools and Upper-Basic schools in the Province as an injection into SPRINT to ensure and enhance learning activities of teachers through lesson study.

The national technical team at the Ministry of education expected Output 1 as Lesson study activities in science are introduced to school at Grades 8-12 in Northwestern Province and Copperbelt Province; Output 2 that Lesson study is strengthened in Central Province. The third (Output 3) was Lesson study framework is integrated into Grades 1-7 SBCPD based on the experience on Grades 8-12 of Central Province. The fourth (Output 4) that Teaching Skills Book is developed based on the experiences of the three target provinces. Output 5 was Management skills book on SBCPD for school managers is developed based on the experiences of the three target provinces. Output 6 was Monitoring of SBCPD is improved in the target provinces.

As Northwestern Province, the related outputs were:

Output 1: Lesson study activities in science are introduced to school at Grades 8-12 in Northwestern Province.

Output 2: Contribution to development of Teaching Skills Book based on the experiences in the North Western Province.

Output 3: Contribution to development of Management skills book on SBCPD for school managers based on the experiences in the North Western Province.

Output 4: Monitoring of SBCPD is improved in North Western Province.

In order to see the effectiveness of the project, Baseline survey was done from in 2008 to obtain the data on the teachers and pupils in the Province. It comprised of two parts, namely;

- Teachers skills on conducting science lessons assessed by the observation of lessons, and
- Pupils perception on their science lessons assessed by administering questionnaires to pupils

2. RATIONALE

The SMASTE-SBCPD project was rolled from Central Province to North Western Province. It was meant to help improve the teaching and learning processes in school consequently, improving teacher/learner performance. The project is scheduled to end in February 2011. At the onset of the project in 2008 a Baseline Survey was carried out in the province. This year, 2010, an Endline Survey has been conducted. This report avails the analysis of both the Baseline and Endline Surveys. Thus it creates a basis of assessing and evaluating how the program has performed in the province.

3. PURPOSE OF RESEARCH

The purposes of this Endline Survey were;

- To facilitate availability 2010 Endline data in relation to the 2008 Baseline data gathered earlier.
- To evaluate the impact of the project on teaching and learning in the classroom by comparing the result of the Baseline and Endline Survey.

4. INSTRUMENTS AND PROCEDURE

4.1. Period

Baseline Survey; February – April 2008, Three Pilot Districts
February – April 2009, Four Non-Pilot Districts
End line Survey; March – July 2010,

4.2. Conductors

Baseline Survey; Facilitators who were either trained with the support of JICA at Mulungushi University (September to October 2008).

Endline Survey; Either members of the Provincial Education Support Team (PEST) or the members of the District Education Support Team (DEST).

4.3. Instruments

The Endline survey had three components. The first component was the lesson observations. Both Sample SMT lessons of 2008 and 2010 were observed by either members of the Provincial Education Support Team (PEST) or the members of the District Education Support Team (DEST). The instrument used to record the lesson observations was Format 02. The instrument (Format 02) consisted of six (6) parts which represented the following factors:

Factor 1 (F1) Objectives and its attainment,

Factor 2 (F2) Lesson Progressing,

Factor 3 (F3) Use of teaching materials

Factor 4 (F4) Bloom's Cognitive level of teacher's questioning techniques

Factor 5 (F5) Task allocated to learners and

Factor 6 (F6) Other factors such as time management, use of chalk board and laboratory safety.

Teacher observations were carried out in 103 schools (35 high schools and 68 basic schools from March to July 2010.

The second component of the Endline Survey was the collection of pupil's perception on their SMT lessons. Format 03 was administered to pupils for this purpose. This instrument comprised 60 questions on how they considered their SMT lessons. It is noteworthy that the questionnaires were administered to pupils in the schools where the Baseline Survey had been conducted. The schools in the sample were 85 i.e. 34 high schools and 51 upper basic schools. The total number of pupils was 2,400 (1,067 high school students and 1,333 basic school pupils).

The third component of the Endline Survey was the capturing of the impression of teachers and school managers on the implementation of the program. Format 04 and Format 05 were the instruments used in this exercise. The instruments captured their impressions classified as:

i. context,

ii. input,

iii. process and

iv. product (CIPP) under the project.

In addition to the data mentioned above, reports from sample schools were used to get the impressions, outputs and challenges that were experienced during the implementation of the project.

5. SAMPLING

5.1. Lesson Observation

The lessons which were observed by facilitators on baseline survey and endline survey are following;
(See Annex 1 for the list of teachers who were observed).

TABLE 1: ***Number of teachers at schools involved in surveys***

Pilot Districts

District	Schools	No. of teachers	
		2008	2010
Solwezi	Jiundu High School	4	2
	Kangwena Basic School	-	1
	Kasapa Basic School	1	-
	Kikombe Basic School	2	1
	Kimasala Basic School	2	1
	Kimiteto Basic School	-	2
	Kisasa Basic School	2	-
	Kyafukuma Basic School	-	1
	Kyawama High School	4	3
	Lamba Basic School	-	1
	Lamba High School	4	1
	Luamvundu Basic School	2	1
	Meheba A Basic School	2	1
	Meheba C Basic School	-	1
	Meheba High School	4	2
	Mushitala Basic School	3	1
	Mutanda High School	-	2
	Rodwell Mwepu Basic School	2	1
	Solwezi Basic School	3	2
	Solwezi Day High School	2	2
	Solwezi Technical High School	4	3
Solwezi District Totals		**41**	**29**
Kasempa	Kaimbwe High School	-	1
	Kasempa Boys High School	3	1
	Kasempa Day High School	5	3
	Lunga High School	-	1
	Mukinge Girls High School	5	4
	Dengwe Basic School	1	1
	Ingwe Basic School	-	1
	Kafumfula Basic School	2	1
	Kalusha Basic School	1	1
	Kamakechi Basic School	1	-
	Kanongo Basic School	1	1
	Kantenda Basic School	2	1
	Kasempa Basic School	1	3
	Kimakubi Basic School	-	1
	Kivuku Basic School	1	1

	Lufupa Basic School	1	1
	Lunga Basic School	-	1
	Miombe Basic School	-	1
	Mukinge Basic School	1	1
	Nkenyauna Basic School	1	1
	Nselauke Basic School	2	1
	Lubofu Basic School	1	-
	Mpungu Basic School	1	-
Kasempa District Totals		**30**	**27**
Mwinilunga	Ikelenge High School	3	1
	Lunga Day High School	3	3
	Lwawu High School	2	2
	Mwinilunga High School	3	4
	Ntambo High School	2	5
	Nyangombe High School	2	3
	Ikelenge Basic School	-	1
	Kabanda Basic School	-	1
	Kanyihampa Basic School	1	5
	Lunga Basic School	-	1
	Lwawu Basic School	-	1
	Mwinilunga Basic School	-	2
	Ntambo Basic	1	1
	Nyangombe Basic School	-	1
	Kalene Basic School	1	-
	Kalene High School	1	-
	Samutemba Basic School	1	-
Mwinilunga District Totals		**20**	**31**

Non- Pilot Districts

District	Schools	No. of teachers	
		2009	2010
Mufumbwe	Kalende High School	2	4
	Kaminzekenzeke High School	2	2
	Kashima High School	2	3
	Mufumbwe High School	3	5
	Chizela Basic School	2	1
	Kalende Basic School	2	-
	Kamabuta Basic School	1	1
	Kaminzekenzeke Basic School	-	1
	Kashima East Basic School	2	-
	Kashima West Basic School	1	1
	Kifuwe Basic School	2	2
	Kyamwina Basic School	2	2
	Mushima Basic School	-	1
	Shukwe Basic School	-	1
Mufumbwe District Totals		**21**	**24**

Kabompo	Kabompo Boys High School	3	6
	Kabulamema High School	3	3
	Kanaji High School	2	3
	Kawanda High School	2	3
	Loloma High School	3	5
	Pokola High School	3	3
	Chikata Basic School	2	1
	Chiweza Basic School	2	1
Kabompo District Totals		**20**	**25**
Zambezi	Chitokoloki High School	-	3
	Kawumbu High School	-	1
	Zambezi Day High School	2	4
	Zambezi High School	9	7
	Chilenga Basic School	2	2
	Chitokoloki Basic School	-	1
	Kasesi Basic School	-	1
	Kawumbu Basic School	-	1
	Lwampungwa Basic School	2	3
	Zambezi Basic School	3	3
Zambezi District Totals		**18**	**26**
Chavuma	Chavuma Day High School	3	3
	Chavuma High School	4	3
	Chiyeke Basic School	2	3
	Kakhoma Basic School	2	3
	Kalombo Basic School	2	2
	Lingelengenda Basic School	2	3
	Moses Luneta Basic School	2	3
	Sanjongo High School	3	-
Chavuma District Totals		**20**	**20**

5.2. Questionnaires

As described above, the study was targeted at Teachers, Pupils and School Managers (Head teachers and Deputy Heads). Table 2 & 3 below show sample schools and number of targets involved in this research.

TABLE 2: ***High School involved in the research***

District	High School	No. of pupils involved	No. of teachers involved	No. of school managers involved
Solwezi (7 High Schools)	Jiundu	43	3	1
	Kyawama	80	3	-
	Lamba	19	2	1
	Meheba	61	2	1
	Mutanda	60	2	-
	Solwezi Day	43	2	1
	Solwezi Technical	77	3	1
Kasempa (5 High Schools)	Kaimbwe	21	2	1
	Kasempa Boys	94	2	1
	Kasempa Day	108	2	1
	Lunga	46	2	1
	Mukinge Girls	102	2	1
Mwinilunga (6 High Schools)	Ikelenge	76	2	1
	Lunga Day	78	2	1
	Lwawu	80	2	1
	Mwinilunga	98	4	2
	Ntambo	37	2	1
	Nyangombe	-	2	1
Mufumbwe (4 High Schools)	Kalende	-	2	1
	Kaminzekenzeke	-	1	1
	Kashima	-	2	1
	Mufumbwe	20	2	1
Kabompo (6 High Schools)	Kabompo	15	4	1
	Kabulamema	15	3	1
	Kanaji	15	3	-
	Kawanda	12	3	1
	Loloma	23	3	1
	Pokola	10	4	1
Zambezi (4 High Schools)	Chitokoloki	15	2	1
	Kawumbu	15	3	1
	Zambezi Day	15	3	1
	Zambezi Boarding	15	3	2
Chavuma (2)	Chavuma Day	20	4	1
	Chavuma High	20	4	1
Totals from High Schools		**1,333**	**87**	**33**

TABLE 3: Basic School involved in the research

District	Basic School	No. of pupils involved	No. of teachers involved	No. of school managers involved
Solwezi (13 Basic Schools)	Kangwena	20	1	1
	Kikombe	54	-	-
	Kimasala	46	-	1
	Kimiteto	28	-	2
	Kisasa	20	-	-
	Kyafukuma	40	2	1
	Lamba	12	1	1
	Luamvundu	20	2	1
	Meheba A	39	1	1
	Meheba C	15	1	1
	Mushitala	20	1	1
	Rodwell Mwepu	52	-	2
	Solwezi	51	3	1
Kasempa (16 Basic Schools)	Dengwe	-	1	1
	Ingwe	26	1	1
	Kafumfula	20	1	1
	Kalusha	-	1	1
	Kamakechi	21	1	1
	Kanongo	29	1	1
	Kantenda	43	1	1
	Kasempa	42	1	1
	Kimakubi	-	1	1
	Kivuku	-	1	1
	Lufupa	-	1	1
Cont.. Kasempa (16 Basic Schools)	Lunga	23	1	1
	Miombe	-	1	-
	Mukinge	-	1	1
	Nkenyauna	-	1	1
	Nselauke	25	1	1
Mwinilunga (8 Basic Schools)	Ikelenge	50	2	1
	Kabanda	46	2	1
	Kanyihampa	61	2	1
	Lunga	-	2	1
	Lwawu	39	2	1
	Mwinilunga	35	2	1
	Ntambo	-	2	1
	Nyangombe	-	2	1

Mufumbwe (10 Basic Schools)	Chizela	-	2	1
	Kalende	20	2	1
	Kamabuta	-	1	1
	Kaminzekenzeke	20	1	-
	Kashima East	20	2	1
	Kashima West	-	2	1
	Kifuwe	20	2	1
	Kyamwina	-	2	1
	Mushima	-	2	1
	Shukwe	-	2	1
Kabompo (2 Basic Schools)	Chikata	5	2	1
	Chiweza	5	2	1
Zambezi (6 Basic Schools)	Chilenga	5	1	1
	Chitokoloki	5	1	1
	Kasesi	5	1	1
	Kawumbu	10	1	1
	Lwampungwa	5	1	1
	Zambezi	10	1	1
Chavuma (5 Basic Schools)	Chiyeke	15	3	1
	Kakhoma	10	3	-
	Kalombo	15	3	1
	Lingelengenda	10	3	-
	Moses Luneta	10	3	1
Totals from Basic Schools		**1,067**	**87**	**56**

1,333 pupils, 87 teachers and 33 school managers from Basic Schools; 1,067 pupils, 87 teachers and 56 managers from High Schools took part in the SMASTE Endline Survey in North Western Province.

6. RESULT AND ANALYSIS

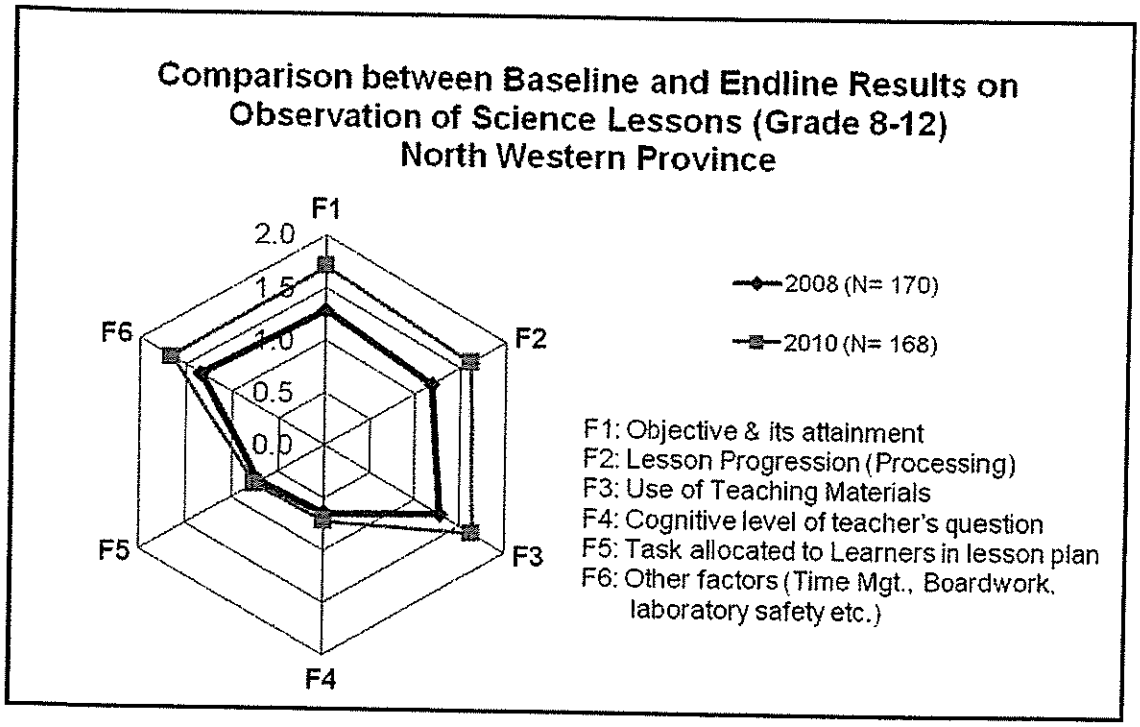
6.1. RESULT ON THE OBSERVATION OF SCIENCE LESSONS (BY FORMAT 02)- FOR THE NORTH WESTERN POVINCE

As indicted earlier the observation of science lessons was done by members of the Provincial Education Support Team (PEST) and Members of the District Education Support Team (DEST) who used Format 02 for recording. The data so obtained was transferred to an excel file. The average was calculated in each part of the instrument. The response "**NO**" was counted as **0**, "Unclear" was counted as **1** while "**Yes**" was coded as **2.** Table 3 and 4 below show the scores for the baseline survey conducted in 2008 and the End-line survey conducted in 2010.

TABLE 4: Result on the Observation of Science Lessons

Analysis Factors	2008 (N=170)	2010 (N=168)
F1: Objective & its attainment	1.2884	1.7033
F2: Lesson Progression (Processing)	1.1843	1.6124
F3: Use of Teaching Materials	1.2821	1.6379
F4: Cognitive Level of Teacher's Questions	0.6492	0.7234
F5: Task allocated to learners in Lesson Plan	0.7047	1.0235
F6: Other factors (Time management, Board, work, Lab. Safety etc.)	1.3342	1.6620

FIGURE 1: Comparison between Baseline and Endline on the Observation of Science Lessons (North Western Province)



As can be seen from table 4 and figure 1, some significant improvement can be seen in factor 1, 2, 3 and 6. In Factor 1, question 4 " Were the lesson objectives told to the students during the lesson" improved by 23% and question 6 "Was there time for evaluating or confirming what the students had learned?" improved by 20 % which contributed to Factor 1 a lot. But question 1 "Are the lesson objectives clearly stated in the lesson plan?", Question 5 "In the lesson, did the students find core contents or concepts by themselves?" have not significantly improved. Therefore we can say that teachers have improved in communicating lesson objectives and evaluating what the students have learned but pay less attention to lesson plans and are more teacher centered during lessons.

Question 3 "There was a presentation by students after an activity," improved by 25% and significantly contributed to factor 2. However, Question 2 "Did the teacher ask the students to hypothesize a solution before instructing them to have an activity or experiment?" did not improve. This makes us deduce that teachers have improved in giving students a chance to present their ideas but the teachers are not helping students to develop the skill of predicting and yet this is a very necessary skill in scientific enquiry.

Factor 3 was steered by 27% improvement in question 4 "The students were able to use or understand the prepared teaching materials," 24% improvement in question 3 " The teacher used improvised or locally available teaching materials in the lesson," and 23% improvement in question 5 "Teaching materials used in the lesson enhanced students' understandings. However, question 2 "Teaching materials were prepared properly before the lesson," did not improve. As a result, we can say that

although teachers are not paying much attention to prepare materials properly before lessons, using local materials significantly help students in the learning process.

The improvement in Factor 6 was enhanced by 34% improvement in question 5 "In the lesson students were guided in taking notes or records well," and 20% improvement in question 3 "The teacher managed the chalk board very well." There was no noticeable improvement in Question 4 "There were no problems in line with laboratory safety in the lesson." This shows that teachers are doing the best they can in finding alternative remedies against the challenges in SMT lessons.

From the table3 and figure 1 we see that there was little or no improvement in factors 4 and 5. In Factor 4, the Bloom's Cognitive Process Dimensions of Educational Objectives was used. Improvement in this factor would be when there was a reduction in objectives 1 (Remember), 2 (Understanding), 3 (Application) and improvement in objectives 4 (Analysis), 5 (Evaluation) and 6 (Creation). Objective 1 "Remember" had a change of -50% and significantly affected factor 4. There was a 5% improvement in objective 5 "Creation". A drastic decrease in objective 1 and an increase in objective 5 did not bring about the desired improvement because the improvements objectives 3, 4 and 5 were not adequate. Therefore, we can say that the cognitive level of teachers' questions had not improved. Capacity development of teachers in this area, therefore, should continue in order that higher order thinking is evoked in pupils. Nevertheless, it is important to point out that under teachers questioning techniques; the instrument captures only the verbal questions that the teacher asks. The written questions that the teacher gives are not captured in this section.

In factor 5, question 1 "Teacher centered tasks," and question 3 "Other tasks," led to a revelation that although teachers were exhibiting activities during lessons, they did not correctly reflect (write) this in their lesson plans. Task allocation, to learners, in the lesson plan is still a challenge among teachers. Though this may be attributed to the inadequacy of science apparatus in the schools, this can never be more than a partial answer. The other reason seems to lie in the limited skills of the teachers to device a variety of teaching strategies that enable active pupil engagement in class. The marginal improvement made in this factor is note-worthy and signifies a positive response to the input so far made by the project in the short period under review. With more time and capacity development of teachers, it is anticipated that significant progress will be made.

COMPARISON OF RESULTS ON THE OBSERVATION OF SCIENCE LESSONS IN PILOT AND NON PILOT DISTRICTS (BY FORMAT 02)

TABLE 5: Result on the Observation of Science Lessons in the three Pilot districts of Solwezi, Kasempa and Mwinilunga

Analysis Factors	2008 (N=91)	2010 (N=86)
F1: Objective & its attainment	1.2051	1.6820
F2: Lesson Progression (Processing)	0.9793	1.4713
F3: Use of Teaching Materials	1.2685	1.6580
F4: Cognitive Level of Teacher's Questions	0.6092	0.6304
F5: Task allocated to learners in Lesson Plan	0.6173	0.7500
F6: Other factors (Time management, Board, work, Lab. Safety etc.)	1.3550	1.5338

FIGURE 2: Comparison between Baseline and Endline on the Observation of Science Lessons in the three Pilot districts of Solwezi, Kasempa and Mwinilunga

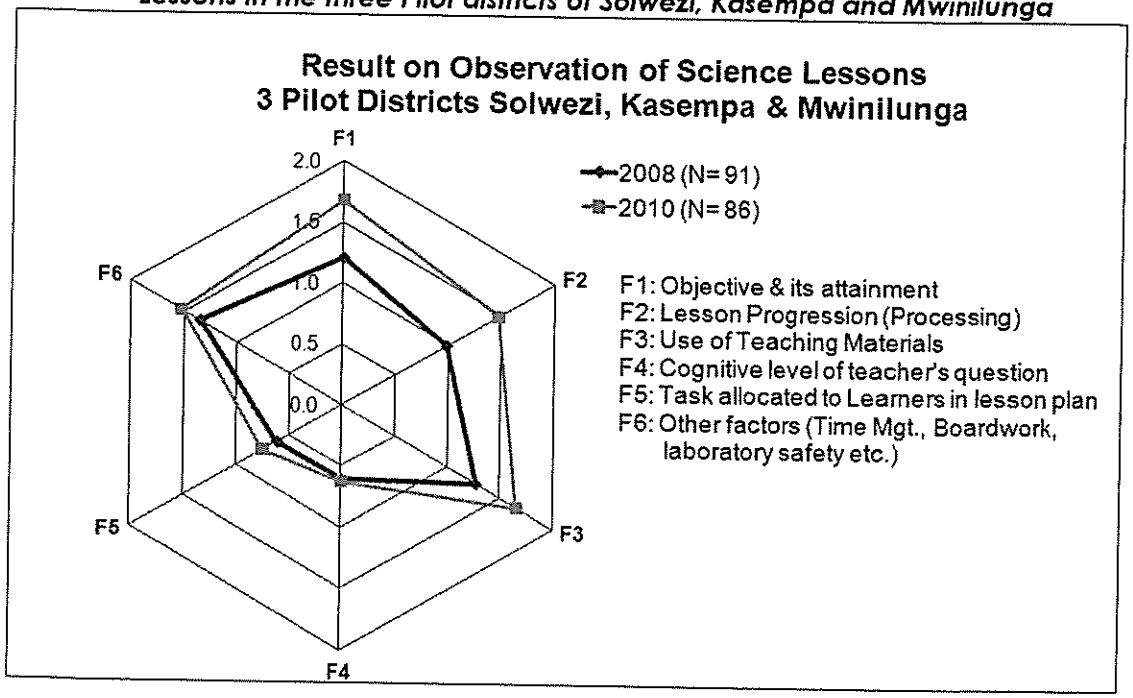
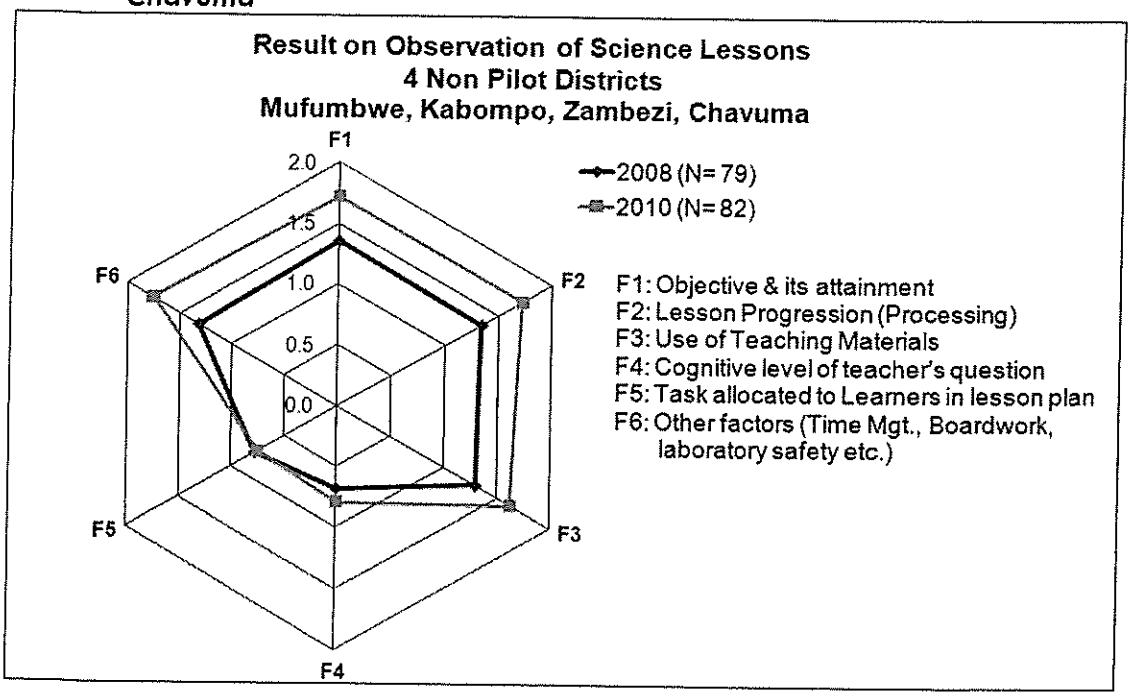


TABLE 6: Result on the Observation of Science Lessons in the four Non-Pilot districts of Mufumbwe, Kabompo, Zambezi and Chavuma

Analysis Factors	2008 (N=79)	2010 (N=82)
F1: Objective & its attainment	1.2051	1.6820
F2: Lesson Progression (Processing)	0.9793	1.4713
F3: Use of Teaching Materials	1.2685	1.6580
F4: Cognitive Level of Teacher's Questions	0.6092	0.6304
F5: Task allocated to learners in Lesson Plan	0.6173	0.7500
F6: Other factors (Time management, Board, work, Lab. Safety etc.)	1.3550	1.5338

FIGURE 3: Comparison between Baseline and Endline on the Observation of Science Lessons in the four Non-Pilot districts of Mufumbwe, Kabompo, Zambezi and Chavuma



As can be seen from table 5, table 6, figure 2 and figure 3; significant improvement can be seen in factors 1, 2, and 3. In pilot districts factor 5 and 6 recorded slight improvement with factor 4 being constant. In non-pilot districts the slight improvement was in factors 4. The improvement in factor 6 was significant but there was slight decline in factor 5.

In Factor 1, question 4 "Were the lesson objectives told to the students during the lesson" improved by 24% in pilot and 22% in non-pilot districts which contributed to

Factor 1 a lot. But in pilot districts question 1 "Are the lesson objectives clearly stated in the lesson plan?", and in non-pilot districts question 7 "Did most of the students attain lesson objectives?" had not significantly improved. Therefore we can say that teachers have improved in verbal communication of lesson objectives to students but teachers in pilot districts pay less attention to proper preparation of lesson plans and those from non-pilot districts are more teacher centered during lessons.

Factor 2, question 4 "There was a discussion among students to find answers or better solutions to the given task" improved by 30% in pilot districts and question 3 "There was a presentation by students after an activity," improved by 24% in non-pilot districts and significantly contributed to factor 2. However, Question 2 "Did the teacher ask the students to hypothesize a solution before instructing them to have an activity or experiment?" did not improve in pilot districts and this was true in the non-pilot districts regarding question 4 "There was a discussion among students to find answers or better solutions to the given task". This makes us deduce that teachers in the pilot districts who have been in the project longer have improved in giving students a chance to present their ideas but due to the short time teachers in non-pilot districts haven't yet improved in helping students to learn probe scientific concepts or values on their own.

Factor 3 was steered by the 26% improvement in question 2 "Teaching materials were prepared properly before the lesson" and 22% improvement in question 5 "Teaching materials used in the lesson enhanced students' understandings" in pilot districts and from non-pilot districts' 33% improvement in question 3 "The teacher used improvised or locally available teaching materials in the lesson," and 33% improvement in question 4 "The students were able to use or understand the prepared teaching materials." However, in pilot districts question 3 "The teacher used improvised or locally available teaching materials in the lesson" and in non-pilot districts, question 1 "Did teachers use any kind of teaching materials apart from chalkboard and chalk?" did not improve. As a result, we can say that teachers are exhibiting the intention of using improvised teaching materials they need help in the preparation of teaching materials for use in the learning process.

In Factor 4, the Bloom's Cognitive Process Dimensions of Educational Objectives was used. Improvement in this factor would be when there was a reduction in objectives 1 (Remember), 2 (Understanding), 3 (Application) and improvement in objectives 4 (Analysis), 5 (Evaluation) and 6 (Creation). In pilot districts Objective 1 'Remember' had a change of -69% but there was +20% on insignificant objective 2 'Understanding and -6% and +8% on vital objectives 4 (Analysis) and 5 (Evaluation), respectively. This led to a record of no improvement. However, in non-pilot districts the -41% in 'Remember' and +30% in 'Understanding' and 'Application' was reciprocated by a +13%, +9% and 7% improvements in 'Analysis', 'Evaluation' and 'Creation' respectively and significantly affected the factor. Therefore, we can say that the cognitive level of teachers' remains a challenge. The recorded no improvement in pilot districts could also be due to the fact a longer exposure to the project sharpened further the observation skills which enabled observers to accurately exposed level of questioning techniques.

In factor 5, pilot districts recorded a slight improvement but there was a slight decline from non-pilot districts. Factor 5 considered the allocation of tasks to learners in the lesson plan thus questions 1 "Teacher centered tasks," Learner or student

centered tasks" and "Others- none of the above." Pilot districts recorded a +55% to students' tasks and declines -45% in teacher and others tasks. Non-pilot districts recorded +45% to students and -55% to teacher and irrelevant tasks. This revealed that teachers in pilot districts have improved in minimizing irrelevant tasks and reducing teacher centered activities. The decline in non-pilot districts comes from the transfer of activities from teacher centered to 'others'. The improvement of tasks to pupils was even more than in pilot districts. Therefore, teachers in non-pilot districts have quickly learnt how to involve pupils in the learning process but need help distinguish the tasks that can be done away with

The Factor 6: In pilot districts improvement was enhanced by 27% improvement in question 4 "There were no problems in line with laboratory safety in the lesson," 26% improvement in question 2 "The teacher prepared for the lesson well," and 25% improvement in question 1 "The teacher managed time well during lesson implementation. However, question 3 "The teacher managed the chalkboard very well" did not improve. In no-pilot districts the improvement of 39% in question 5 "In the lesson students were guided in taking notes or records well," and 24% improvement in question 3 "The teacher managed the chalk board very well," contributed a great deal to this factor. There was no improvement in question 4 "There were no problems in line with laboratory safety in the lesson." This shows that teachers in pilot districts have improved in controlling safety during SMT lessons while teachers in the non-pilot districts need help in this area. However, teachers in non-pilot districts have improved in managing the chalkboard which teachers in the pilot districts find a problem. Probably due to the longer exposure to the project teachers in the pilot districts have impressively improved in preparing for lessons.

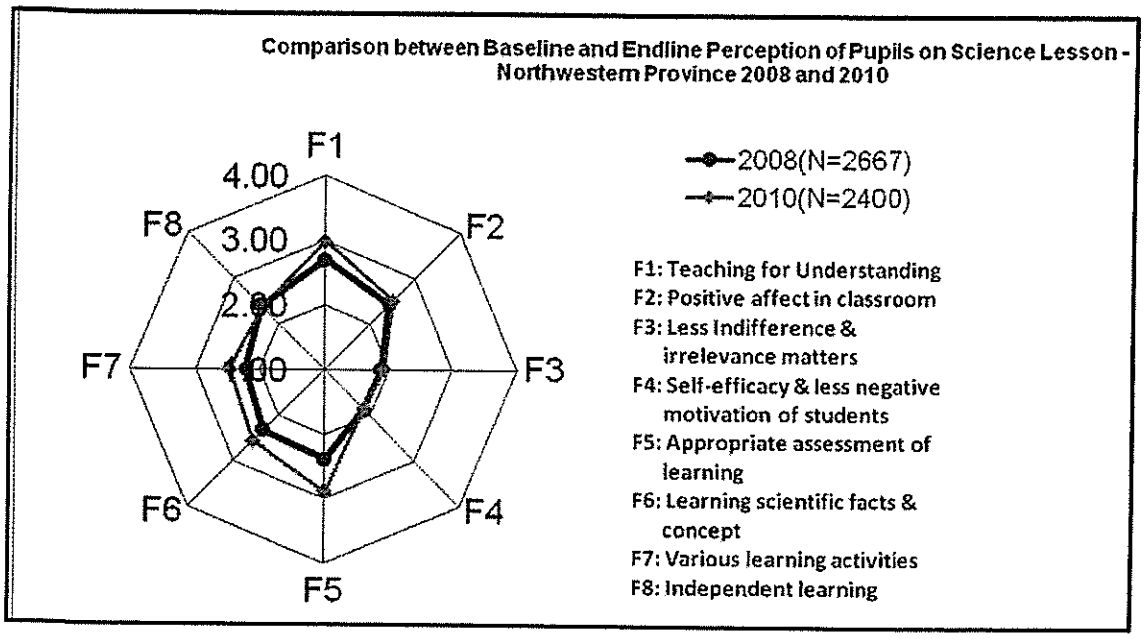
6.2. RESULTS ON THE QUESTIONNAIRES FOR PUPILS

The collected data on the questionnaires to the pupils labeled Format 03 was encoded into calculation sheet in MS Excel and, as the author of the instrument stated, the data was categorized into 8 factors related to the teaching. Table 7 shows average points for respective factors in the analysis.

TABLE 7: Result on the Perception of Pupils on Science Lessons

Analysis Factors	2008 (N=2667)	2010 (N=2,400)
F1: Teaching for Understanding	2.70	2.98
F2: Positive affect in classroom	2.42	2.50
F3: Less indifference & irrelevance matters	1.89	1.93
F4: Self-efficacy & less negative motivation of students	1.87	1.86
F5: Appropriate assessment of learning	2.39	2.90
F6: Learning scientific facts & concepts	2.34	2.57
F7: Various learning activities	2.22	2.48
F8: Independent learning	2.39	2.36

FIGURE 4: Comparison between Baseline and Endline on the Perception of Pupils on Science Lessons



The perception of pupils on their science lessons was divided into eight (8) factors. Table 7 and figure 4 indicate that there was noticeable improvement in pupils' perception under factors 1, 5, 6, and 7. There was slight positive change in factor 2 and 3. A slight decline in the pupils' perception of independent learning (Factor 8) was seen.

In Factor 1, question 1 "My teacher in this class gives examples that help me understand lessons in science" improved by 31%, question 7 "My teacher tries to find out if we understood our past lesson before teaching us a new lesson" improved by 30% and question 20 "My teacher tries very hard to connect new ideas to past lessons in science" improved by 20 % which contributed to Factor 1 a great deal. But question 8 "My teacher tries to know if we are confident about what we learn in our science class", Question 27 "My teacher asks questions that help me understand my science lesson" have not significantly improved. Therefore we can say that pupils feel that teachers have improved in being in context with the syllabus and evaluating what the students have learned but give less personal attention to individual students.

Factor 5, question 18 "My grades are a good sign of how much I have learned" improved by 27%, question 19 "My grades in this class are a good sign of how hard I studied in science" improved by 27% and question 34 "My grades are a good sign of the kind of work how I do in my science class" improved by 19% which constituted Factor 5. Therefore we can say there is an improvement in pupils' perception that activities in their SMT lessons positively contribute to their learning.

Factor 6, question 2 "My teacher connects new scientific ideas to other science lessons" improved by 14%, question 3 "My teacher tells us to memorize concepts

and facts" improved by 16% but question 13 "My teacher wants us to memorize and at the same time understand the scientific facts and concepts" had a marginal improvement of 4%. From this we can say that pupils' perceive that teachers are getting better at helping them memorize scientific facts but they do not equally fell that when it comes to understanding scientific facts and concepts.

Factor 7, question 40 "My science teacher likes us to make predictions and test our theories" improved by 16%, question 42 "My teacher gives more lectures than other activities" improved by 18%, question 49 "My teacher lets us work in groups so that we can discover things together" improved by 17% and question 60 "My teacher uses experiments during our science lessons," improved by 14%. Therefore, we can see that pupils' feel that there is an improvement in variety of activities during SMT lessons.

There was slight positive change in factor 2. Question 33 " This class made me more interested in science" improved by 33% and question 28 "This class makes me like science very much" improved by 24% but question 47 "the laboratory activities my teacher gives me us lively and fun did not improve. From this we can say that although the challenge of laboratory apparatus is reducing the positive affect in SMT classrooms, pupils feel that teachers are effectively implementing remedies to improve learning.

Question 44 "I do not think that science is important in my life," improved by 2% but question 52 "Getting high grades in this class depends more on being born intelligent than studying improved by 6% and contributed to a great deal to Factor 3. Therefore, we can say that pupils look at science as an important subject in their lives but the improvement is to the perception that in spite of their challenges (perception of being born intelligent or dull) studying hard helps to improve their grades in class.

There was a slight decline in the pupils' perception of independent learning (Factor 8). Question 37 "My teacher wants me to think for my self," declined by 3% and contributed to factor 8. However, question 38 "My teacher thinks that students are responsible for their own learning," improved by 1%. We can, therefore, tell that while pupils feel that teachers are doing most of the classroom presentation there is an improvement in the confidence that pupils can also contribute to their learning.

6.3. RESULT OF QUESTIONNAIRES TO TEACHERS

Table 8 shows the result of the teachers' perception on the implementation of the SMASTE-CPD. The questionnaire measured the extent to which they agreed with the given statement.

TABLE 8: Result of Questionnaire to Teachers (N=168)

Questions	Average
1. I often participate in workshops and trainings for teachers.	3.69
2. I think teachers have to continue learning, even after we leave college.	4.77
3. I need more skills and updated information on teaching.	4.68
4. It's good that lesson study activities have been introduced in our school under SMASTE program.	4.65
5. SMASTE-CPD program .aims to improve knowledge & skills of teachers through lessons study as school CPD. I think this objective is appropriate to the teachers.	4.60
6. Our school has an activity plan for SMASTE activities including lesson demonstrations.	4.59
7. The SMASTE facilitator assigned to my school or zone is doing good job.	4.20
8. I was given an opportunity to participate in the CPD meetings conducted by the SMASTE facilitator.	4.29
9. I have adequate apparatus/equipment for teaching.	3.25
10. I was oriented by facilitator / school managers on how to conduct lesson study at school.	4.41
11. I appreciate that the SMASTE activities have been introduced at school level.	4.53
12. Our school head and deputy head are supportive to lesson study activities of teachers.	4.36
13. I always get new idea or skill from lesson study activities at school.	4.47
14. We are following 8 steps of lesson study activities at school.	4.32
15. Our school head and deputy often give us useful comments and suggestions for improvement of teaching.	4.37
16. I became confident in teaching through activities under SMASTE program.	4.30
17. I now spend more time for preparing my lessons.	4.40
18. I feel that the team work of our teachers was strengthened through this program.	4.41
19. I wish that lesson study activities would be continued next year.	4.56
20. I believe that the framework of SMASTE-CPD program can work if taken to other schools and provinces.	4.58

Scale:
1-Strongly Disagree; **2**-Disagree; **3**-Neither Disagree nor Agree; **4**-Agree; **5**-Strongly Agree

6.4. RESULT OF QUESTIONNAIRES TO MANAGERS

Table 9 shows the result of the school managers' perception on the implementation of the SMASTE-CPD. The questionnaire measured the extent to which they agreed with the given statement.

TABLE 9: Result of Questionnaire to School Managers (N=88)

Questions	Average
1. Teachers in my school often participate in workshops and trainings for the improvement of teaching.	4.04
2. Teachers have to continue learning, even after they become teachers.	4.86
3. Teachers in my school need more skills and updated information on teaching.	4.61
4. It's good that lesson study activities have been introduced in our school under SMASTE program.	4.66
5. SMASTE-CPD program .aims to improve knowledge & skills of teachers through lessons study as school CPD. I think this objective is appropriate to the teachers.	4.70
6. Our school has an activity plan for SMASTE activities including lesson demonstrations.	4.54
7. The SMASTE facilitator assigned to my school or zone is doing good job.	4.23
8. In our school, an opportunity has been provided for teachers to participate in the CPD meetings conducted by the SMASTE facilitator.	4.38
9. We have adequate apparatus/equipment for teaching.	3.47
10. We have conducted an orientation on how to conduct lesson study at school.	4.59
11. I appreciate that SMASTE activities have been introduced at school level.	4.65
12. Teachers in my school are cooperative in conducting lesson study activities.	4.39
13. Teachers in my school always get new idea or skill from lesson study activities at school.	4.36
14. We are following 8 steps of lesson study activities at school.	4.32
15. In lesson study activities, I often give comments and suggestions for improvement of teaching to the teachers.	4.42
16. Teachers in my school became confident in teaching through activities under SMASTE program.	4.26
17. Teachers in my school now spend more time for preparing their lessons.	4.29
18. I feel that the team work of our teachers was strengthened through this program.	4.39
19. I wish that lesson study activities would be continued next year.	4.66
20. I believe that the framework of SMASTE-CPD program can work if taken to other schools and provinces.	4.67

Scale:

1-Strongly Disagree; **2**-Disagree; **3**-Neither Disagree nor Agree; **4**-Agree; **5**-Strongly Agree

FIGURE 5: Result of Questionnaire to Teachers & School Managers

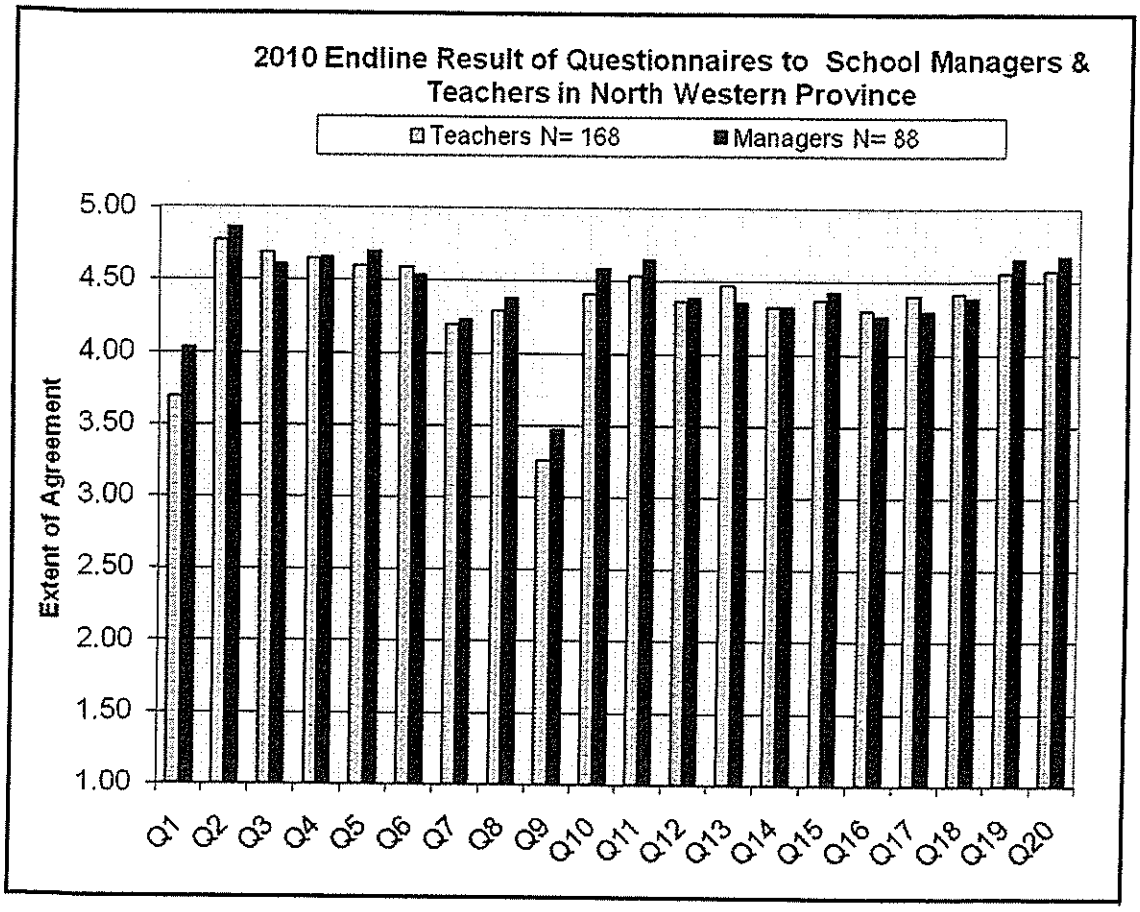


Figure 5 shows the extent of agreement with the statements in the teachers and managers' questionnaires in Tables 5 and 6. Extent 1 up to 3 indicates disagreement and 3-5 indicate the rate of agreement. From Figure 3, we can see that all questions are above 3. This shows that there is a general appreciation of the SMASTE-SBCPD program among teachers and school managers in North Western Province.

Question 9 is the least agreed to. This shows that both teachers and managers feel that the biggest challenge was inadequate apparatus/equipment for teaching.

The level of question 1 is below 4. This shows that teachers' attendance to trainings and workshops for improvement of teaching is not adequate.

Questions 7, 8, 10, 13-18 are between 4 and 4.5. This shows a high level of agreement. From this we can say that both teachers and managers feel school based SMASTE activities are more practical in improving learning. However, the level question 7 show that both teachers and managers feel that the facilitators assigned to schools could have done better. According to question 13 teachers are more enthusiastic about the benefit of getting new ideas or skills from lesson study activities at school. Questions 2-6, 11, 19 and 20 received the highest agreement level above 4.5. Question 19 and 20 indicate their desire for the continuation of the program. The

highest was question 2 where they feel learning ought to continue. From this we can say that teachers and managers appreciate the concept of continued professional development and would like SMASTE-CPD to continue among them and even extended to other teachers.

FIGURE 6: Implementors' evaluation of SMASTE-SBCPD on CIPP in North Western Province

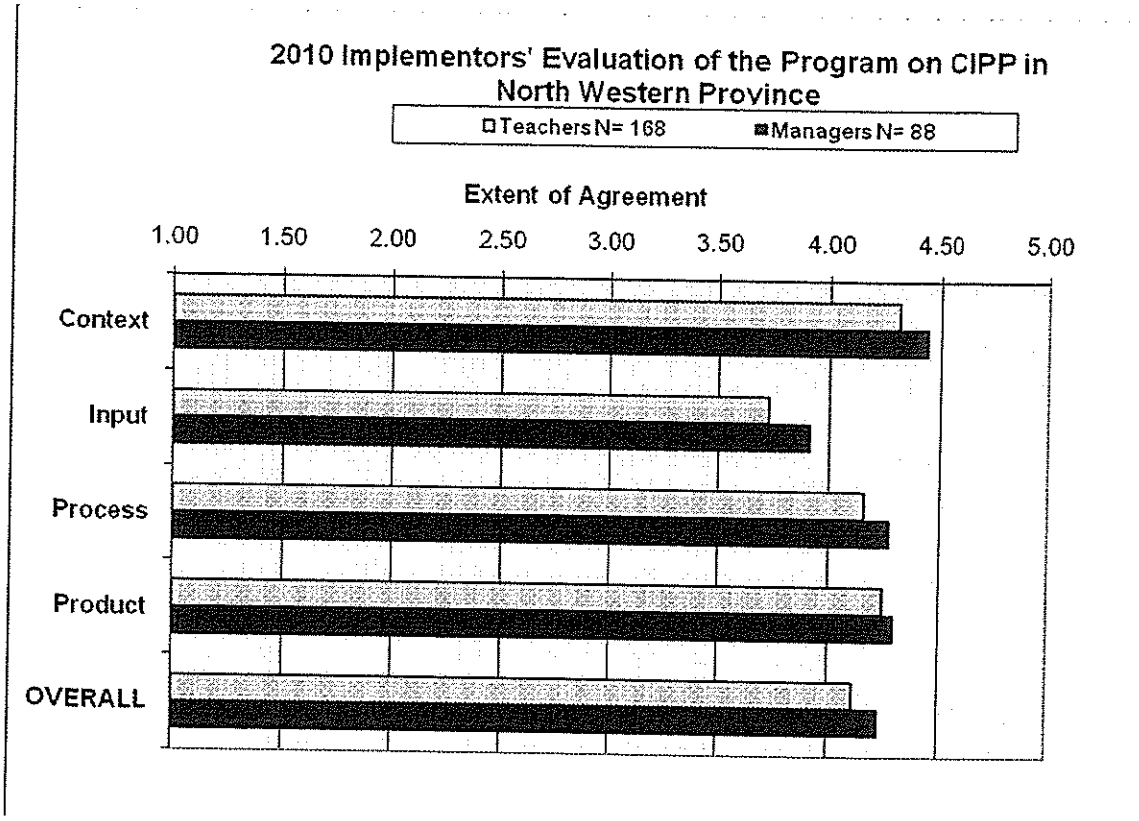


Figure 6 shows the extent of agreement to the program's evaluation regarding context, input, process, product as perceived in North Western Province. Extent 1 up to 3 indicates disagreement and 3-5 indicate the rate of agreement. From figure 4 we can see that all the CIPP level I good

Context: The agreement level was 4.44. Question 2 was 4.82 but question 1 was only 3.84. This shows that there is a high acknowledgement to continued learning but the implementation of continued learning is low.

Input agreement level was 3.91 and was the least. Question 7 (3.88) and 9 (2.55) greatly contributed to this but question 10 was 4.51. From this we can say that teachers and managers facilitators need to do more that they did and that apparatus/equipment is also a big challenge. However, schools have benefited from SMASTE-SBCPD to find solutions to alleviate the impact of challenges in SMT learning in schools.

Process agreement level was 4.27 which was influenced largely by question 11 (4.55) but question 13 was only 4.13. Therefore we can say that the introduction of the

program at school level is helping to improve SMT learning but facilitators and continued learning activities need more encouragement.

Product level was 4.30. This was influenced a great deal by questions 19 (4.56) and question 20 (4.60). However question 16 was only 4.02. We can, therefore, say that lesson study is necessary in the quest to improve SMT learning in schools. In addition, it is also important continue to help teachers to be more confident in teaching as is attainable under the SMASTE-SBCPD program.

When evaluated on the CIPP teachers indicated that as a consequence of the programme, they spent more time on preparation of lessons, received more useful feedback from their supervisors on their teaching and that they saw strengthened teamwork emerging amongst them. As a result of the observed benefits of the programme, most teachers indicated that they wished the programme could be continued the following year. Most school managers acknowledged that the SMASTE-SBCPD aimed to improve knowledge and skills of teachers through lesson study at school and that the objective was appropriate for teachers. The managers saw lesson study as a forum where their teachers got new ideas which enhanced their teaching. In their teachers, most managers saw increased confidence in teaching and strengthened teamwork. Both teachers and managers, however, indicated a deficiency in the availability of apparatus/equipment for teaching. The desire to have lesson study activities continue the following year was expressed managers also. They also recommended that the program could work if taken to other schools and provinces.

7. CONCLUSION

From the afore-going it is clear that lesson study activities in North Western Province have impacted positively on classroom practice. Team working, which the programme has fostered among teachers, is a foundation for successful exchange of ideas which will help teachers realize the most of their potential. In this way this injection into the already existing SPRINT system is necessary. The confidence acquired by the teachers as a consequence of the programme is steadily driving them to the full realization that as teachers they ought to, to, not only be learned but continue learning; this is the aim of continuing professional development. The process of lesson study is expected to steadily transform them into a type of teacher who will do their job with passion and precision. The quarterly reports from the districts to the province are an indication of a strengthened monitoring system though frequent external support monitoring was a challenge because of the cost implications posed by the vast distances between centers. Increased availability of financial resources could enhance the multiplier effect of the programme, therefore. The indicated increased participation by pupils in lessons is a sign of improved lesson delivery.

Despite the acknowledgement of the benefits of lesson study by teachers, a number indicated that it was time consuming. Strategies, therefore, which negate this impression, must be administered. Further, the shortage of apparatus in the schools is impeding on successful teaching and learning. It is appreciable that part of what lesson study is doing is to improve the skill of the teacher in improvisation, but this has its limits. Stocking of institutions with apparatus/equipment is still very cardinal in effective teaching and learning.

Although there may be challenges in the course of its implementation, the lesson study programme has proved beneficial and should be recommended for any institution intending to improve the quality of learning and teaching.

Annex 1

List of Teachers who took part in the SMASTE-SBCPD Surveys

SOLWEZI DISTRICT

List of Teachers who took part in the SMASTE-SBCPD Surveys

Teacher	School	Name of Teacher	TS No.
1	Jiundu High School	Kasanga	
2	"	Munangwa	75794
3	Kangwena Basic School	Mututa	74220
4	Kikombe Basic School	Kalipenta	68830
5	Kimasala Basic School	Chewe	73219
6	Kimiteto Basic School	Sitenge	85545
7	"	Njamba	803319
8	Kyawama High School	Kamfwa	75763
9	"	Mwila	801199
10	"	Ngongola	803903
11	Kyafukuma Basic School	Kaluba	805545
12	Lamba Basic School	Kasangili	75787
13	Lamba High School	Katontoka	74914
14	Luamvundu Basic School	Kasongo	56890
15	Meheba A Basic School	Mambwe	88154
16	Meheba C Basic School	Kamwendo	74550
17	Meheba High School	Mugala	89472
18	"	Chikoti	76160
19	Mushitala Basic School	Chansa	801304
20	Mutanda High School	Samanjomba	74482
21	"	Saliki	89792
22	Rodwell Mwepu Basic School	Namfukwe	54592
23	Solwezi Basic School	Katende	73211
24	"	Mulila	805066
25	Solwezi Day High School	Chalwe	73217
26	"	Chelu	806749
27	Solwezi Technical High School	Mpulumba	75654
28	"	Mutale	74074
29	"	Sakaumbu	803274

KASEMPA DISTRICT

List of Teachers who took part in the SMASTE-SBCPD Surveys

Teacher	School	Name of Teacher	TS No.
1	Dengwe Basic School	Munangwa	75794
3	Ingwe Basic School	Katontoka	74914
4	Kafumfula Basic School	Kamwendo	74550
5	"	Samanjomba	76182
6	Kaimbwe High School	Chalwe	73217
7	Kalusha Basic School	Samanjomba	74482
8	Kamakechi Basic School	Kamfwa	75763
9	Kamakechi High School	Simwemba	806712
10	Kanongo Basic School	Kyailusa	074195
11	Kantenda Basic School	Brightone	73910
12	"	Mulenga	72483
13	"	Mutobo	71966
14	Kasempa Basic School	Kasangili	75787
15	"	Kasongo	56890
16	"	Matebele	73446
17	"	Mututa	74220
18	Kasempa Boys High School	Kayombo	803911
19	"	Mazimba	803288
20	Kasempa Boys High School	Mwila	801199
21	Kasempa Day High School	Chelu	806749
22	"	Kamocha	800581
23	"	Mahina	74209
24	"	Mayondi	
25	"	Sitenge	085545
26	Kimakubi Basic School	Kamfwa	75763
27	Kivuku Basic School	Mpulumba	75654
28	Lubofu Basic School	Likomeno	75779
29	Lufupa Basic School	Kasanga	75117
30	Lunga Basic School	Sakala	75511
31	Lunga High School	Njamba	803319
32	Miombe Basic School	Chikoti	76160
33	Mpungu Basic School	Kayindama	76499
34	Mukinge Basic School	Fungaloko	74208
35	Mukinge Girls High School	Chansa	801304
36	"	Kaluba	805045
37	"	Mambwe	89154
38	"	Mushima	806733
39	"	Wishikoti	802294
40	Nkenyauna Basic School	Mulenga	74474
41	Nselauke Basic School	Kamwendo	74550
42	"	Sakangende	73087
43	"	Sakutaha	76261

MWINILUNGA DISTRICT

List of Teachers who took part in the SMASTE-SBCPD Surveys

Teacher	School	Name of Teacher	TS No.
1	Ikelenge Basic School	Petulu	76246
2	Ikelenge High School	Koma	73352
3	Kabanda Basic School	Nduwa	74102
4	Kanyihampa Basic School	Mangalilo. T. R	73884
5	"	Sangungula. J	75356
6	"	Kunda. J.	73348
7	"	Kalumba. R	72761
8	"	Mutale. P	72681
9	Lunga Basic School	Selemani	76836
10	Lunga Day High School	Kapila. S	803869
11	"	Banda. F	805052
12	"	Sibajene. O	73102
13	Lwawu Basic School	Mukanda	76870
14	Lwawu High School	Kasongo	72727
15	"	Changwe	806731
16	Mwinilunga Basic School	Kamboyi. P	73878
17	"	Munkombwe	72487
18	Mwinilunga High School	Soneka. L	806732
19	"	Muzeya. D	77990
20	"	Lundulanga. E	73906
21	"	Chishala. R	805056
22	Ntambo Basic School	Katukula	75365
23	Ntambo High School	Kasanyinga	76210
24	"	Musonda	73444
25	"	Makayi	73342
26	"	Mbanvu	80386
27	"	Katakwe	73879
28	Nyangombi Basic School	Kipume	75355
29	Nyangombi High School	Nkanza	75917
30	"	Mututa	71562
31	"	Banda	803866

MUFUMBWE DISTRICT

List of Teachers who took part in the SMASTE-SBCPD Surveys

Teacher	School	Name of Teacher	TS No.
1	Chizela Basic School	Kuwema. J	74532
2	Kifuwe Basic School	Likashi. D	75829
3	"	Katai. S	74252
4	Kalende High School	Luwaile. A	74523
5	"	Nyambe. R	74250
6	"	Chinyama. M	75161
7	"	Chokwe. J	800579
8	Kamabuta Basic School	Lijoni. G	75830
9	Kashima High School	Chibabwe	803261
10	"	Mwiinga. K	73054
11	"	Chilonga. J	75176
12	Kashima West Basic School	Shimika	74257
13	Kyamwina Basic School	Chiyenge. R	73945
14	"	Chilemo. L	74127
15	Kaminzekenzeke Basic School	Kalukangu. S	75824
16	Kaminzekenzeke High School	Kashina. G	803394
17	"	Luwawa. B	75832
18	Mufumbwe High School	Katolika	74549
19	"	Kawangu	803360
20	"	Kombo	805556
21	"	Kandela	76384
22	"	Kasanga. K	74249
23	Mushima Basic School	Ngonga. T	72650
24	Shukwe Basic School	Mandevu. M	74524

KABOMPO DISTRICT

List of Teachers who took part in the SMASTE-SBCPD Surveys

Teacher	School	Name of Teacher	TS No.
1	Chikata Basic School	Liweleya. M	75082
2	Chiweza Basic School	Lyumba. G	73412
3	Kabompo High School	Chewe. S	801399
4	"	Mwandila N. N	803912
5	"	Makina. E	76114
6	"	Sikanyika. S	803837
7	"	Chewe. S	801399
8	"	Mulomba. F	803836
9	Kabulamema High School	Zuze. C. E	74151
10	"	Zuze. C. E	74151
11	"	Kakoma. C	76760
12	Kanaji High School	Katema. K	74140
13	"	Beenzu. H. B	806727
14	"	Katema. K	74140
15	Kawanda High School	Phiri. A	803209
16	"	Phiri. A	803209
17	"	Saviye. J	73964
18	Loloma High School	Luka. B	73957
19	"	Chaulezo. G	72204
20	"	Kiyana. A	803847
21	"	Lubinda. A	72606
22	"	Masumba. C	73240
23	Pokola High School	Kayembe. R	76561
24	"	Pumbwe. G	74021
25	"	Ndumba. F	75024

ZAMBEZI DISTRICT

List of Teachers who took part in the SMASTE-SBCPD Surveys

Teacher	School	Name of Teacher	TS No.
1	Chilenga Basic School	Mutupa. F	77329
2	"	Mununga. A	76006
3	Chitokoloki Basic School	Chiyanzu. J	76012
4	Chitokoloki High School	Mubiana	803885
5	"	Yawila	73513
6	"	Chola	803599
7	Kasesi Basic School	Kaluwaji. T	74881
8	Kawumbu Basic School	Mandanji. M	76040
9	Kawumbu High School	Lyongela. S	72320
10	Lwampungwa Basic School	Chijokolu. A	76004
11	"	Haaninga. P	76269
12	"	Kasweka. G	77463
13	Zambezi Basic School	Nyirenda Miss	805094
14	"	Kabaso	77529
15	"	Kasoka	76308
16	Zambezi Day High School	Simakumba	74883
17	"	Mrs Kalolu	803894
18	"	Chilomba. E	74887
19	"	Chipongwe	805098
20	Zambezi High School	Chilongo. P	806742
21	"	Mukochi. M	75600
22	"	Samukolo. M	80388
23	"	Makayi. H	74176
24	"	Musau. J	805095
25	"	Ms. Gozwa	72581
26	"	Kankomba. A	803998

CHAVUMA DISTRICT

List of Teachers who took part in the SMASTE-SBCPD Surveys

Teacher	School	Name of Teacher	TS No.
1	Chavuma Day High School	Njapawu	805011
2	"	Katakala	805011
3	"	Hanambe	803908
4	Sanjongo High School	Shiku Hendricks	74224
5	"	Nsana	74498
6	"	Siyoto	74315
7	Chiyeke Basic School	Kalyati	74497
8	"	Zulu	74499
9	"	Mbilikita	73795
10	Kakhoma Basic School	Pumulo	76588
11	"	Libamba M.	76655
12	"	Kapeshi C	75455
13	Kalombo Basic School	Kawina	71440
14	"	Kalyati	72882
15	Lingelengenda Basic School	Kangungu	75648
16	"	Kasangili	75443
17	"	Sakahya GC	75434
18	Moses Luneta Basic School	Muyelu	74501
19	"	Kapeshi C	75455
20	"	Samasoji J.	74496

SBCPD Monitoring & Evaluation Format 02A　　Date:__/__/____

Lesson Assessment Format (for monitoring use)

Lesson Information:

District:_____School:_____
Subject:_____Grade: _____
Topic:_____
Teacher (Demonstrator):_____(TS No.:_____)

1. Objectives & Its Attainment

Please check one of three categories (No: Unclear: Yes) on the following items

#	Item	No	undecided	Yes
1	Are the lesson objectives clearly stated in the lesson plan?			
2	Are the stated objectives attainable by the pupils in a lesson?			
3	Are the stated objectives measurable?			
4	Were the lesson topics told to the students during the lesson?			
5	In a lesson, did the students find core contents or concept by themselves?			
6	Was there time for evaluating the lesson to confirm whether the students had learned?			
7	Were the lesson objectives attained?			

2. Lesson Progression

Please check one of three categories (No: Unclear: Yes) on the following items.

#	Item	No	undecided	Yes
1	Was there an introduction to the lesson?			
2	Did the introductory part of the lesson motivate students well?			
3	Did the teacher ask the students to hypothesize a solution before instructing them to have an activity?			
4	Was there a presentation by pupils in a lesson?			
5	There was a discussion among pupils to find answers or better solutions to the given tasks.			
6	The teacher intended to confirm a particular concept or values in the process of teaching.			
7	Both the pupils were able to conclude what they had learned in a lesson.			

3. Teaching Materials

Please check one of three categories (No: Unclear: Yes) on the following items.

#	Item	No	undecided	Yes
1	Did the teacher use any kind of teaching materials apart from blackboard and chalk?			
2	Teaching materials were prepared properly before the lesson.			
3	The teacher used improvised or locally available teaching materials in a lesson.			
4	The pupils were able to use or understand the prepared teaching materials.			
5	Teaching materials used in a lesson enhanced pupils' understandings.			

4. Questioning done by a teacher

The teacher's questions in a lesson categorized by Bloom's Taxonomy (Cognitive Process Dimension) of Educational Objectives.

	Remem-bering	Under-standing	Applying	Analysing	Evaluating	Creating	Others	Total
Number of Teacher's Questions								
Percentage								100 %

5. Task allocation in the Lesson Plan

	Number of Tasks	Percentage
Teacher centered tasks on a lesson plan		
Learner centered tasks on a lesson plan		
Other descriptions (None of Above)		
Total		100 %

6. Other Factors

#	Item	No	undecided	Yes
1	The teacher managed time well during lesson implementation.			
2	The teacher prepared for the lesson well.			
3	The teacher managed the blackboard well.			
4	The teacher gave enough attention to safety of learning environment.			
5	The teacher guided pupils on taking notes or records well.			
6	The teacher's attitude to the pupils was fine.			
7	The teacher involved all the learners in the lesson.			

7. Comments (if any)

Name of the Teacher: _____ TS No:_____ Signature_____

Observed by:

Name:_____
Title:_____
Date:_____

SBCPD Monitoring & Evaluation Format 04

QUESTIONNAIRE ON THE IMPLEMENTATION OF SBCPD

FOR TEACHERS

The items below describe the matters related to the implementation of lesson study activities under School-Based CPD program. Please read each item carefully and decide whether you agree or disagree with each item. Encircle the number corresponding to your response using the following scale: **1- (SD) Strongly Disagree; 2-(D) Disagree; 3-(NDA) Neither Disagree nor Agree; 4-(A) Agree; 5-(SA) Strongly Agree.**

Items	SD D NDA A SA
CONTEXT	
1. I rarely participate in workshops and trainings for teachers.	1 2 3 4 5
2. I think teachers have to continue learning, even after we leave college.	1 2 3 4 5
3. I need more skills and updated information on teaching.	1 2 3 4 5
4. It's good that lesson study activities have been introduced in our school under SBCPD program.	1 2 3 4 5
5. SBCPD program aims to improve knowledge & skills of teachers through lessons study as school CPD. I think this objective is appropriate to the teachers.	1 2 3 4 5
INPUT	
6. Our school has an activity plan for SBCPD activities including lesson demonstrations.	1 2 3 4 5
7. The SBCPD facilitator assigned to my school or zone is doing good job.	1 2 3 4 5
8. I was given an opportunity to participate in the CPD meetings conducted by the SBCPD facilitator.	1 2 3 4 5
9. I have adequate apparatus/equipment for teaching.	1 2 3 4 5
10. I was oriented by facilitator / school managers on how to conduct lesson study at school.	1 2 3 4 5
PROCESS	
11. I appreciate that the SBCPD activities have been introduced at school level.	1 2 3 4 5
12. Our school head and deputy head are supportive to lesson study activities of teachers.	1 2 3 4 5
13. I always get new idea or skill from lesson study activities at school.	1 2 3 4 5
14. We are following 8 steps of lesson study activities at school.	1 2 3 4 5
15. Our school head and deputy give us useful comments and suggestions for improvement of teaching.	1 2 3 4 5
PRODUCT	
16. I became confident in teaching through activities under SBCPD program.	1 2 3 4 5
17. I now spend more time for preparing my lessons.	1 2 3 4 5
18. I feel that the team work of our teachers was strengthened through this program.	1 2 3 4 5
19. I wish that lesson study activities would be continued next year.	1 2 3 4 5
20. I believe that the framework of SBCPD program can work if taken to other schools and provinces.	1 2 3 4 5

Thank you very much for your kind cooperation!!

SBCPD Monitoring & Evaluation Format 05

QUESTIONNAIRE ON THE IMPLEMENTATION OF SBCPD

FOR SCHOOL MANAGERS (HEAD & DEPUTY HEAD TEACHER)

The items below describe the matters related to the implementation of lesson study activities under SBCPD program. Please read each item carefully and decide whether you agree or disagree with each item. Encircle the number corresponding to your response using the following scale: **1- (SD) Strongly Disagree; 2-(D) Disagree; 3-(NDA) Neither Disagree nor Agree; 4-(A) Agree; 5-(SA) Strongly Agree.**

Items	SD D NDA A SA
CONTEXT	
1. Teachers in my school rarely participate in workshops and trainings for the improvement of teaching.	1 2 3 4 5
2. Teachers have to continue learning, even after they become teachers.	1 2 3 4 5
3. Teachers in my school need more skills and updated information on teaching.	1 2 3 4 5
4. It's good that lesson study activities have been introduced in our school under SBCPD program.	1 2 3 4 5
5. SBCPD program aims to improve knowledge & skills of teachers through lessons study as school CPD. I think this objective is appropriate to the teachers.	1 2 3 4 5
INPUT	
6. Our school has an activity plan for SBCPD activities including lesson demonstrations.	1 2 3 4 5
7. The SBCPD facilitator assigned to my school or zone is doing good job.	1 2 3 4 5
8. In our school, an opportunity has been provided for teachers to participate in the CPD meetings conducted by the SBCPD facilitator.	1 2 3 4 5
9. We have adequate apparatus/equipment for teaching.	1 2 3 4 5
10. We have conducted an orientation on how to conduct lesson study at school.	1 2 3 4 5
PROCESS	
11. I appreciate that SBCPD activities have been introduced at school level.	1 2 3 4 5
12. Teachers in my school are cooperative in conducting lesson study activities.	1 2 3 4 5
13. Teachers in my school always get new idea or skill from lesson study activities at school.	1 2 3 4 5
14. We are following 8 steps of lesson study activities at school.	1 2 3 4 5
15. In lesson study activities, I give comments and suggestions for improvement of teaching to the teachers.	1 2 3 4 5
PRODUCT	
16. Teachers in my school became confident in teaching through activities under SBCPD program.	1 2 3 4 5
17. Teachers in my school now spend more time for preparing their lessons.	1 2 3 4 5
18. I feel that the team work of our teachers was strengthened through this program.	1 2 3 4 5
19. I wish that lesson study activities would be continued next year.	1 2 3 4 5
20. I believe that the framework of SBCPD program can work if taken to other schools and provinces.	1 2 3 4 5

Thank you very much for your kind cooperation!!

SBCPD Monitoring & Evaluation Format 03A

QUESTIONNAIRE FOR PUPILS ON THE PERCEPTION OF THE LESSON

SCIENCE VERSION (For Grade 8 – 12)

Directions: We want to know what you think and feel about your science class. Please read each sentence below carefully. Tell us if the sentence describes your science class. Tell us if the sentences never, sometimes, often, or always happen. Please encircle your answer.

N= Never S = Sometimes O = Often A = Always

1. My teacher in this class gives examples that help me understand lessons in science.	N	S	O	A
2. My teacher connects new scientific ideas to other science lessons.	N	S	O	A
3. My teacher tells us to memorize concepts and facts.	N	S	O	A
4. I like the laboratory activities in my science class.	N	S	O	A
5. My teacher wants us to concentrate on how to ask scientific questions, collection of data, and discover new facts than on the memorization.	N	S	O	A
6. I feel free to express my scientific ideas in this class.	N	S	O	A
7. My teacher tries to find out if we understood our past lesson before teaching us a new lesson.	N	S	O	A
8. My teacher tries to know if we were confident about what we learn in our science class.	N	S	O	A
9. I understand the basic topics in my science class.	N	S	O	A
10. My teacher tells us that what she teaches us is true.	N	S	O	A
11. My teacher thinks that we know more about science than we really do.	N	S	O	A
12. I spend most of my time in this class copying what my teacher writes on the board.	N	S	O	A
13. My teacher wants us to memorize and at the same time understand the scientific facts and concepts .	N	S	O	A
14. I don't understand the lessons my teacher teaches.	N	S	O	A
15. This class emphasizes what students 'need to know,' rather than what they 'should be able to do' with the scientific concepts.	N	S	O	A
16. My teacher tells us what facts or concepts are important to learn.	N	S	O	A
17. I am not very good in science that is why I can't understand my science lessons.	N	S	O	A
18. My grades are a good sign of how much I have learned.	N	S	O	A
19. My grades in this class are a good sign of how hard I studied in science.	N	S	O	A
20. My teacher tries very hard to connect new ideas to past lessons in science	N	S	O	A
21. The seatwork and laboratory activities in this class are boring.	N	S	O	A
22. My teacher supports competition for grades among students.	N	S	O	A
23. My teacher is able to slowly improve our understanding of scientific ideas.	N	S	O	A
24. My teacher has a hard time answering our questions in class.	N	S	O	A
25. My teacher wants us to join in classroom discussions.	N	S	O	A
26. My teacher connects scientific concepts to the 'real world'.	N	S	O	A
27. My teacher asks questions that help me understand my science lesson.	N	S	O	A
28. This class makes me like science very much.	N	S	O	A
29. My teacher talks about the effects of science to history and society.	N	S	O	A
30. My teacher would try to do everything just to be sure that we understand the ideas taught in class.	N	S	O	A

31. My teacher is not very interested or excited to teach science.	N	S	O	A
32. My teacher is effective in teaching science.	N	S	O	A
33. This class made me more interested in science.	N	S	O	A
34. My grades are a good sign of the kind of work I do in my science class.	N	S	O	A
35. My teacher tries hard to make sure students understand the lesson.	N	S	O	A
36. It's okay to ask my teacher for help if there are things I don't understand.	N	S	O	A
37. My teacher wants me to think for myself.	N	S	O	A
38. My teacher thinks that students are responsible for their own learning	N	S	O	A
39. My science class builds a strong foundation for understanding science at a higher level.	N	S	O	A
40. My science teacher likes us to make predictions and test our theories.	N	S	O	A
41. My teacher is clear and exact about what she expects students to learn.	N	S	O	A
42. My teacher gives more lectures than any other activities.	N	S	O	A
43. My teacher is not friendly.	N	S	O	A
44. I do not think that science is important in my life.	N	S	O	A
45. When I grow up, I will take a job that uses a lot of science.	N	S	O	A
46. Grades do not matter in this class because I am happy with what I am.	N	S	O	A
47. The laboratory activities my teacher gives us are lively and fun.	N	S	O	A
48. The way my teacher explains ideas in science is very clear.	N	S	O	A
49. My teacher lets us work in groups so that we can discover things together.	N	S	O	A
50. My teacher is more interested in finishing her lesson plan than helping us learn the lesson.	N	S	O	A
51. My teacher doesn't give comments on the results of our science activities.	N	S	O	A
52. Getting high grades in this class depends more on being born intelligent than studying hard.	N	S	O	A
53. This class is boring.	N	S	O	A
54. I am still excited about learning more about science.	N	S	O	A
55. Science has nothing to do with my life.	N	S	O	A
56. My teacher lets us do scientific research projects.	N	S	O	A
57. My teacher checks and marks my exercises and homework.	N	S	O	A
58. My teacher comes for lessons on time.	N	S	O	A
59. My teacher makes us fear science.	N	S	O	A
60. My teacher uses experiments during our science lessons.	N	S	O	A

Age: _____ Sex: ❑Male ❑Female

Subject:_____ Grade and Class:_____

エンドライン調査報告書補足資料－生徒用質問項目のうち分析に用いた質問項目の一覧－

生徒用質問表は合計 60 項目の質問項目が含まれているが、各州が行った集計では要素ごとに特定の質問項目のみを抽出し分析を行った。分析項目と質問項目の対応は下表のとおり。

Factor		No.	Questions
F1	Teaching for Understanding	1	My teacher in this class gives examples that help me understand lessons in science.
		7	My teacher tries to find out if we understood our past lesson before teaching us a new lesson.
		8	My teacher tries to know if we were confident about what we learn in our science class.
		16	My teacher tells us what facts or concepts are important to learn.
		20	My teacher tries very hard to connect new ideas to past lessons in science
		27	My teacher asks questions that help me understand my science lesson.
		30	My teacher would try to do everything just to be sure that we understand the ideas taught in class.
		35	My teacher tries hard to make sure students understand the lesson.
		36	It's okay to ask my teacher for help if there are things I don't understand.
		40	My science teacher likes us to make predictions and test our theories.
		41	My teacher is clear and exact about what she expects students to learn.
F2	Positive Affect in Classroom	4	I like the laboratory activities in my science class.
		6	I feel free to express my scientific ideas in this class.
		9	I understand the basic topics in my science class.
		28	This class makes me like science very much.
		33	This class made me more interested in science.
		45	When I grow up, I will take a job that uses a lot of science.
		47	The laboratory activities my teacher gives us are lively and fun.
		54	I am still excited about learning more about science.
F3	Less Indifference and Irrelevance Matters	31	My teacher is not very interested or excited to teach science.
		43	My teacher is not friendly.
		44	I do not think that science is important in my life.
		46	Grades do not matter in this class because I am happy with what I am.
		50	My teacher is more interested in finishing her lesson plan than helping us learn the lesson.
		51	My teacher doesn't give comments on the results of our science activities.
		55	Science has nothing to do with my life.
F4	Self-efficacy and Less Negative Motivation of Students	14	I don't understand the lessons my teacher teaches.
		17	I am not very good in science that is why I can't understand my science lessons.
		21	The seatwork and laboratory activities in this class are boring.
		43	My teacher is not friendly.
		53	This class is boring.

F5	Appropriate Assessment of Learning	18	My grades are a good sign of how much I have learned.
		19	My grades in this class are a good sign of how hard I studied in science.
		34	My grades are a good sign of the kind of work I do in my science class.
F6	Learning Scientific Facts and Concept	2	My teacher connects new scientific ideas to other science lessons.
		3	My teacher tells us to memorize concepts and facts.
		5	My teacher wants us to concentrate on how to ask scientific questions, collection of data, and discover new facts than on the memorization.
		18	My grades are a good sign of how much I have learned.
F7	Various Learning Activities	40	My science teacher likes us to make predictions and test our theories.
		42	My teacher gives more lectures than any other activities.
		49	My teacher lets us work in groups so that we can discover things together.
		60	My teacher uses experiments during our science lessons.
F8	Independent Learning	37	My teacher wants me to think for myself.
		38	My teacher thinks that students are responsible for their own learning.