Latin America and Caribbean Regions

DATA COLLECTION SURVEY FOR INTRODUCING A NEW EFFICIENT MODEL OF REMOTE WORK TO IMPLEMENT JICA PROJECTS/ ACTIVITIES IN THE LATIN AMERICA AND CARIBBEAN AREAS

FINAL REPORT

MARCH 2022

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

JAPAN DEVELOPMENT SERVICE CO., LTD. (JDS)

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ABBREVIATIONS

Abbreviation	English
ADDIE	Analysis・Design・Development・Implementation・Evaluation
ADSL	Asymmetric Digital Subscriber Line
AGCID	Chilean International Cooperation Agency for Development
AI	Artificial Intelligence
ANAC	National Civil Aviation Agency
API	Application Programming Interface
AR	Augmented Reality
AWS	Amazon Web Services
BI	Business Intelligence
Blu-ray	Blu-ray Disc
BPM	Business Process Management
BRL	Brazil Real
CGI	Common Gateway Interface
C/P	Counterpart
CMOS	Complementary Metal Oxide Semiconductor
CNC	Computer Numerical Control
COVID-19	Coronavirus disease 2019
CPU	Central Processing Unit
CRF	Constant Rate Facto
DB	Data Base
DL	Download
DFR	Draft Final Report
DRR	Disaster Risk Reduction
DVD	Digital Versatile Disc
DX	Digital transformation
ECDL	European Computer Driving License
FAQ	Frequently Asked Question
FDD	Frequency Division Duplex
FR	Final report
GI	Geographic Information
GIS	Geographic Information System
GPS	Global Positioning System
HP	Home Page
HRD	Human Resource Development
ICR	Inception Report
ICT	Information Communication Technology
IoT	Internet of Things
IP	Internet Protocol
IPA	Information-technology Promotion Agency
ISAPI	Internet Server Application Program Interface
IT	Information technology
ITSL	IT Literacy Standard
JICA	Japan International Cooperation Agency
JOCA	Japan Overseas Cooperative Association
LTE	Long Term Evolution
LMS	Learning Management System
LPWA	Low Power Wide Area
LT	Latency
MARN	Ministerio de Medio Ambiente y Recursos Naturales
MDSF	Ministry of Social Development and Family
MTG	Meeting
NS	National Staff

Abbreviation	English
NVR	Network Video Recorder
OB	Old Boy
OG	Old Girl
OJT	On the Job Training
ONEMI	National Office of Emergency of the Interior Ministry
ONVIF	Open Network Video Interface Forum
OVOP	One Village One Product
OS	Operating System
PC	Personal computer
PDCA	Plan Do Check Act
PPT	Microsoft Power Point
PRGR	Progress Report
PTZ	Pan Tilt Zoom
Q&A	Question and Answer
QJIS	Quantum Geographic Information System
RPA	Robotic Process Automation
SABESP	Companhia de Saneamento Básico do Estado de São Paulo
SATREPS	Science and Technology Research Partnership for Sustainable Development
SCORM	Sharable Content Object Reference Model
SHEP	Smallholder Horticulture Empowerment & Promotion
SOP	Standard Operating Procedures
SSML	Speech Synthesis Markup Language
R/D	Record of Discussion
RPA	Robotic Process Automation
SICA	Sistema de la Integración Centroamericana
SMS	Short Message Service
SNS	Social Networking Service
ToR	Terms of Reference
UI	User Interface
UP	Upload
UTM	Unified Threat Management
UX	User Experience
URL	Uniform Resource Locator
VAN	Value-Added Network
VBA	Visual Basic for Applications
VC	Venture Capital
VR	Virtual Reality

1. Outline of the Study

1.1 Background and Objectives of the Study

In line with the worldwide spread of the COVID-19 pandemic, all departments of JICA have been earnestly examining the preparation of setups for remotely implementing Projects/ Activities in fiscal 2020. Specifically, examination is underway regarding introduction of a learning management system (LMS) that can cater to the implementation of Online Knowledge Co-Creation Program (KCCP) (Group and Region Focus), etc. in fiscal 2020 and all future training, implementation of remote operations, and adoption of primarily digital transformation (DX) in JICA projects/ activities. If such efforts contribute to the remote implementation of JICA projects/ activities and the basic environment for Information Communication Technology (ICT) is prepared, it will become possible for counterparts in target countries to access the same quality of information. Meanwhile, it is necessary to pay attention to the issue of disparities in information access arising from differences in the ICT environment between each country and area.

Amidst restrictions on business travel and going outside due to the COVID-19 pandemic, JICA Overseas Offices in Latin America and the Caribbean have started to conduct remote work via online meetings, etc. in spite of the time difference with Japan. In the preliminary hearings conducted on JICA Overseas Offices in Latin America and the Caribbean by the JICA Latin America Department in September 2010, it was found that conditions regarding preparation of the environment for remotely implementing projects/ activities differ between countries. It was confirmed that whereas preparations have been made without a hitch in some countries, multiple others are confronted with issues and needs. Needs were confirmed regarding the installation of equipment and materials on the side receiving training (C/P agencies, etc.), securing of an internet communications environment in remote areas, and monitoring and construction of efficient communication systems in project/ activity sites. Moreover, there are some JICA Overseas Offices that also require advice concerning how to prepare the ICT environment. Especially it was confirmed that, with respect to preparation of the remote project/ activity environment, there are urgent needs regarding measures to address KCCP (Group and Region Focus), for which remote implementation is being successively introduced from fiscal 2020 onwards.

Generally speaking, since the level of development in Latin America and the Caribbean is relatively high, the general environment in urban areas has been established to a certain extent and it is easy to access the infrastructure and tools for implementing remote work in most countries. In addition, since the region has common or similar language and culture, provided that the infrastructure for conducting remote work is established, it will be easy to efficiently advance country-focused projects/ activities and wide area projects/ activities that entail training, seminars, etc. using the same contents. Although Latin America and the Caribbean face constraints in terms of work efficiency brought about by geographical separation, it is anticipated that project/ activity implementation in this region can be efficiently and

effectively advanced through utilizing DX technology to effectively and efficiently combine onsite cooperation with offsite (remote) cooperation, both during and after the COVID-19 pandemic.

In this Study, through surveying and analyzing methods for implementing JICA projects/ activities (including Training program, Technical Cooperation, ODA grants, ODA loans, etc.) in Latin America and the Caribbean and the implementation structure of counterparts and JICA, and conducting Demonstration Survey (PoC), the main objective is to propose methods for preparing and firmly establishing the ICT environment for project/ activity implementation and systems for remote implementation utilizing DX technology in Latin America and the Caribbean.

1.2 Study Implementation Method

The overall picture based on background recognition of the Study is understood as follows.

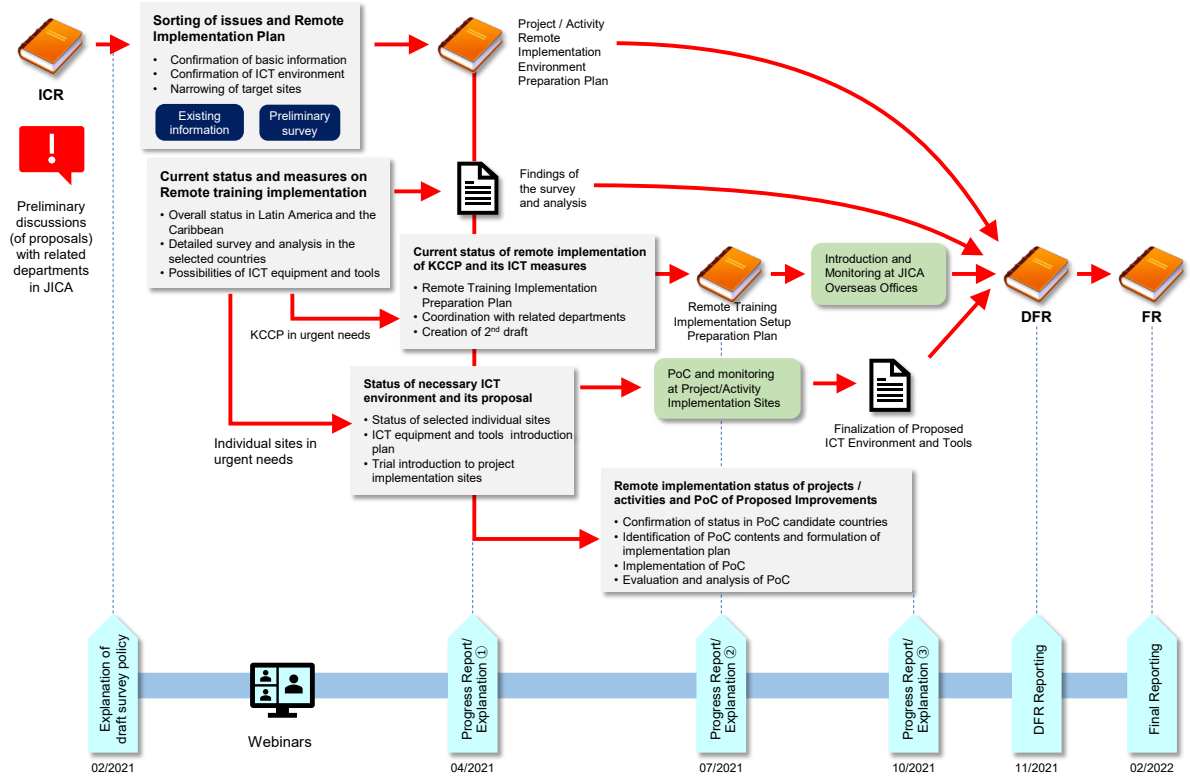


Figure-1 Overall Picture of the Study Work (Background Recognition/ Issues/ Outputs)

1.2.1 Study Implementation Flow

Figure-2 shows the overall workflow of the Study.

It was originally intended to travel out for the work, however, due to the difficulties imposed on traveling in Latin America and the Caribbean and the fact that the Demonstration Surveys (PoC) showed that remote implementation was feasible, it was decided to conduct all the Study work remotely.

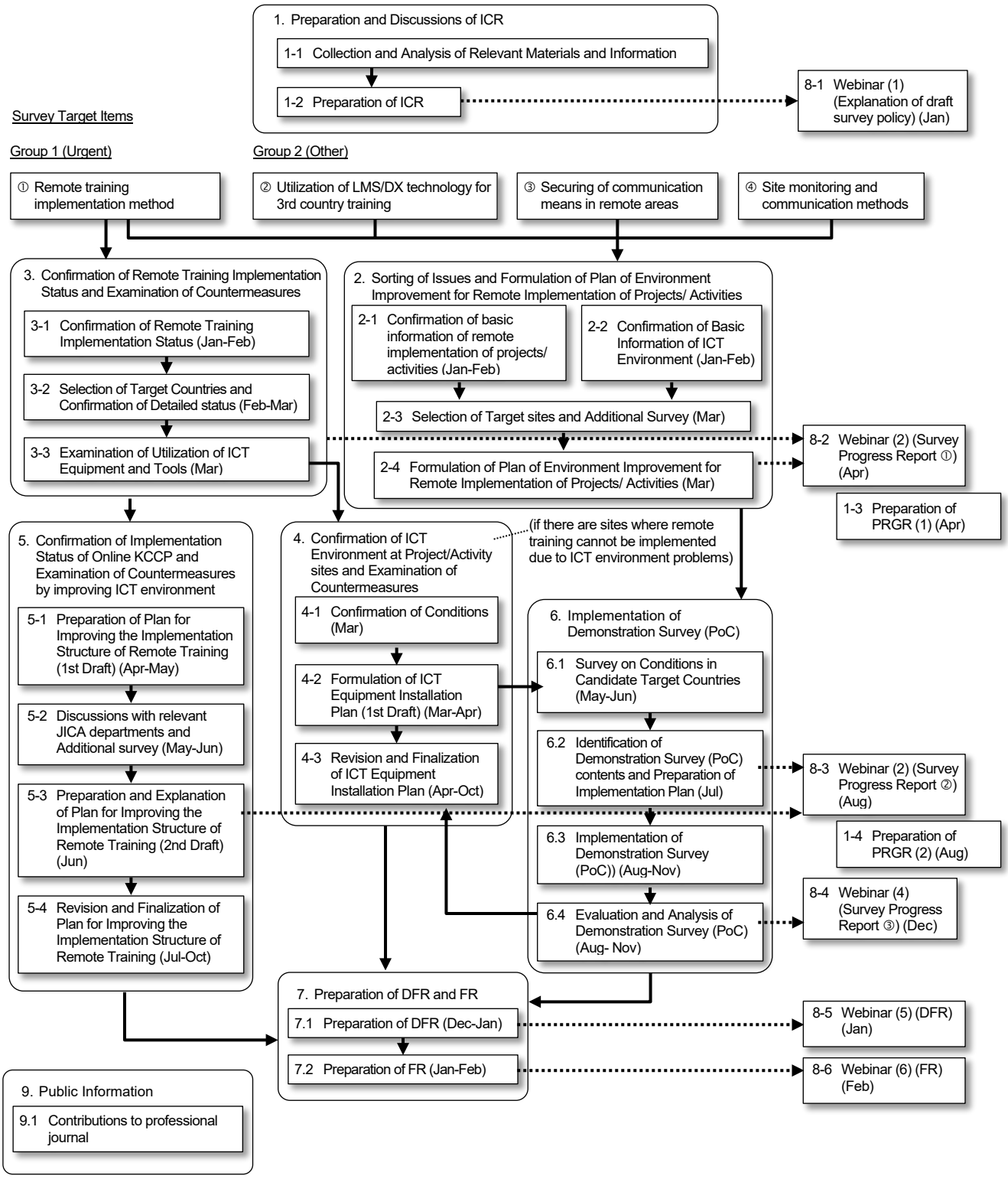


Figure-2 Overall Workflow of the Study

1.2.2 Study Implementation Structure

The following table indicates the Study implementation structure.

Table-1 Study Implementation Structure

Name	Organization	Work Area
Yukiyo YAMADA	Japan Development Service Co., Ltd.	Team Leader / Remote Work Preparation Planning 1
Yoichi KOGURE	Japan Development Service Co., Ltd.	Deputy Leader / Remote Work Preparation Planning 2
Tsutomu OHNO	Japan Development Service Co., Ltd.	ICT tools utilization/ Development of training and teaching materials 1
Yosuke SAITOH	Digital Knowledge Co., Ltd.	ICT tools utilization/ Development of training and teaching materials 2
Yoji MURAKAMI	Japan Development Service Co., Ltd.	Network engineer/ Informatization of project/activity site 1
Valeria Patricia Reinosa de Mónico	Japan Development Service Co., Ltd. (resident in El Salvador)	Informatization of project/activity site 2 (Central America and Caribbean region)
Andres Molina Lopez	Japan Development Service Co., Ltd. (resident in Paraguay)	Informatization of project/activity site 3 (South America region)
Nobuaki HATAYAMA	Japan Development Service Co., Ltd.	Informatization of project/activity site 4
Senkei TO	Digital Knowledge Co., Ltd.	Production of LMS contents
Tatsuro SUGIMOTO	Digital Knowledge Co., Ltd.	Production of LMS contents

1.2.3 Study Target Items

The Study targets are divided into 2 groups: urgent items, and other items. The Study target items shall be as follows. (No change from the Inception Report).

Table-2 Study Target Groups and Study Items

Study target group	Study target items
Group 1 (Urgent)	① Proposal of countermeasures for remote implementation of JICA training program (Group and Region Focus, Country Focus, Training for Nikkei Communities[1], Young Leaders, etc.)
Group 2 (Others, may be revised following the needs analysis)	① Proposal and verification of utilization of LMS and DX technology for effective and efficient implementation of Third Country Training Program ② Methods for securing and providing Internet communication means in remote areas ③ Proposal and verification of mechanism for project/ activity site monitoring and efficient communication methods

1.2.4 Contents and Implementation Methods of the Study

This section specifically describes the contents and implementation methods of each work component indicated in the preceding workflow. The following sections describe the work contents upon dividing them into [Work] and subordinate [Processes].

[1] Communities of the descendants of Japanese emigrants

[Work 1] Preparation and Discussion of the Inception Report (ICR) and Progress Reports (PRGR)

Process 1-1 Collection and Analysis of Relevant Materials and Information for ICR

Existing relevant materials were collected, sorted and analyzed for examination of the Study policy and methods.

Process 1-2 Preparation of ICR

Based on the results of analysis conducted in [Process 1-1], the Study draft policy and Study methods were compiled into the Inception Report that was discussed with JICA for its approval. The contents of the ICR were explained to the Latin America and Caribbean Department, related divisions in JICA headquarters, and JICA Overseas Offices in Latin America and the Caribbean (Japanese Office staff, national staff, etc.), and feedback was reflected in the Study contents. (Explanation was conducted in the webinar in [Process 8-1].)

Process 1-3 Preparation of PRGR (1)

The results of [Work 2] and [Work 3] and the progress status of [Work 4] and [Work 5] were compiled into Progress Report (1) to be submitted to JICA. The contents were explained and discussed in the webinar in [Process 8-2].

Process 1-4 Preparation of PRGR (2)

The results of [Work 4] and [Work 5] (including the [Work 2] "Plan for Improving the Implementation Structure of Remote Training") and survey plan of [Work 6] were compiled into Progress Report (2) to be submitted to JICA. The contents were explained and discussed in the webinar in [Process 8-3].

[Work 2] Sorting of Issues for Promotion of Remote Implementation in Latin America and the Caribbean, and Formulation of the Plan of Environment Improvement for Remote Implementation of Projects/Activities

Process 2-1 Confirmation and Classification of Basic Information for Remote Implementation of Projects/Activities

Responses to the preliminary questionnaire that JICA sent to the overseas offices in Latin America and the Caribbean were obtained in order to grasp the situation regarding remote implementation of JICA projects/activities (training, technical cooperation projects, ODA loans, ODA grants, etc.), problems in implementation caused by COVID-19, needs regarding remote implementation of the projects/activities and so on.

Also, questionnaire survey to confirm basic information on the ICT environment was implemented in respect to 23 JICA Overseas Offices in Latin America and the Caribbean.

The confirmed issues and needs were sorted and classified and compiled into the Study target items (draft).

Process 2-2 Confirmation of Basic Information on ICT Environment

The basic ICT environment in JICA Overseas Offices and the countries where JICA Overseas Offices are located in Latin America and the Caribbean was confirmed from existing information, etc. possessed by JICA.

Also, questionnaire survey to confirm basic information on the ICT environment was implemented in respect to 23 JICA Overseas Offices in Latin America and the Caribbean.

Process 2-3 Selection of Target Sites and Additional Survey

As additional survey, questionnaire surveys were implemented with persons in charge of Technical Cooperation Projects/Activities, the Knowledge Co-Creation Program (KCCP) (Country Focus), the Training Program for Nikkei Communities, and the Third Country Training Program (TCTP). Table-3 shows the persons targeted in the questionnaire surveys.

Table-3 Questionnaire Surveys Implemented for Process 2-3 and Process 3-2

Questionnaire Contents	Survey Targets
Technical Cooperation Projects/ Activities	JICA persons in charge of Technical Cooperation Projects/ Activities Technical Cooperation experts
Knowledge Co-Creation Program (KCCP) (Country Focus)	JICA persons in charge of Knowledge Co-Creation Program (KCCP) (Country Focus) Projects/Activities, subcontractors for the Knowledge Co-Creation Program (KCCP) (Country Focus)
Training Program for Nikkei Communities	JICA persons in charge of Projects/ Activities Training Program for Nikkei Communities, and organizations proposing the Training Program for Nikkei Communities
Third Country Training Program (TCTP)	JICA persons in charge of Third Country Training Program (TCTP) Projects/ Activities, and Third Country Training Program

Concerning training Projects/Activities, hearings on issues and meetings to explain LMS were conducted 2 times for JICA persons in charge of Projects/Activities (Headquarters and Overseas Offices), domestic training implementation agencies (Knowledge Co-Creation Program (KCCP) (Country Focus) and Training Program for Nikkei Communities) and overseas training implementation agencies (Third Country Training Program (TCTP)).

Also, individual hearings were conducted with 4 JICA Domestic Offices, 12 JICA Overseas Offices, and the relevant departments at JICA Headquarters.

Process 2-4 Formulation of the Plan of Environment Improvement for Remote Implementation of Projects/ Activities

Based on the above surveys, the Study plan was compiled as the "Plan of Environment Improvement for Remote Implementation of Projects/Activities".

The following [Work 3] [Work 5] was only implemented for the Study target items of Group2.

[Work 3] Confirmation of Remote Implementation status of JICA training (Group and Region Focus, Country Focus, Training for Nikkei Communities, Third Country Training Program, etc.) and Examination of countermeasures

Process 3-1 Confirmation of Implementation Status of Remote Training in Latin America and the Caribbean

Implementation status of JICA training (Group and Region Focus, Country Focus, Training for Nikkei Communities, Third Country Training Program (TCTP), etc.) remotely implemented in Latin America and the Caribbean was confirmed based on data provided by the relevant departments in JICA and results of the questionnaire survey conducted in Process 2-1.

Process 3-2 Selection of Study Target Countries and Confirmation of Detailed Conditions

Confirmation of detailed conditions was conducted through the questionnaire and hearing surveys implemented in Process 2-3. After confirming the detailed conditions, countermeasures for the needs regarding remote training were examined.

Process 3-3 Examination of Utilization of ICT Equipment and Tools

Based on the above surveys, examination was conducted on utilization of ICT equipment and ICT tools for remote implementation of training (including design of contents for remote training) in Latin America and the Caribbean.

[Work 4] Confirmation of ICT Environment for Remote Training and Examination of Countermeasures at Project/Activity Sites (1-2 Sites)

Process 4-1 Confirmation of Conditions in View of Supporting ICT Environment Improvement at Project/Activity Sites

One or two project/activity sites (C/P agencies of Technical cooperation, JICA Overseas Offices) where it is considered difficult to conduct remote training due to an inadequate ICT environment were selected and their conditions were surveyed. Specifically, hearing survey was implemented on conditions at the Vocational Training Agency in the Dominican Republic, which was cited as an example in the questionnaires and hearings.

Process 4-2 Formulation of ICT Equipment Installation Plan (1st Draft)

The ICT equipment installation plan (1st draft) for the Project/Activity sites surveyed in [Process 4-1] was compiled.

Process 4-3 Revision and Finalization of ICT Equipment Installation Plan

Based on [Process 4-1] and [Process 4-2], improvement of the ICT environment does not require any special equipment. Since training can be implemented remotely providing there are a regular ICT environment and stable, high-speed internet lines in place, support was not provided for the Demonstration Survey (PoC) and installation. Instead, the problems and issues that were confirmed through the questionnaire survey and hearing surveys were reflected in the final proposal contents, and the results were reflected in the DFR and FR. (Reflected in Chapter 6)

[Work 5] Confirmation of Implementation Status of Online Knowledge Co-Creation Program (Group and Region Focus) and Examination of Countermeasures by improving ICT Environment

Process 5-1 Preparation of the "Plan for Improving the Implementation Structure of Remote Training (1st Draft)"

Based on the results of analysis in [Work 3], the "Plan for Improving the Implementation Structure of Remote Training (1st Draft)" was prepared. In this plan, multiple implementation patterns corresponding to conditions in each country and the type of training were prepared, and the methods for conducting training and preparing ICT environment were proposed for each implementation pattern.

Process 5-2 Discussions with Relevant JICA Departments and Additional Survey

Concerning the "Plan for Improving the Implementation Structure of Remote Training (1st Draft)" prepared in [Process 5-1], discussions were conducted with related departments in JICA. Also, additional survey was conducted in the related agencies.

Process 5-3 Preparation and Explanation of the Plan for Improving the Implementation Structure of Remote Training (2nd Draft)

Based on the discussions and additional survey of [Process 5-2], the "Plan for Improving the Implementation Structure of Remote Training (2nd Draft)" was prepared. Explanations were conducted for JICA Overseas Offices in Latin America and the Caribbean and feedback was reflected in the Plan. (Explanation was conducted in the webinar of [Process 8-3]).

Process 5-4 Revision and Finalization of the Plan for Improving the Implementation Structure of Remote Training

The problems and issues confirmed through installation support were reflected in the final proposal contents. Ongoing follow-up and monitoring were conducted and the findings were reflected as Chapter 5 in the DFR and FR.

[Work 6] Confirmation of Remote Implementation Status of JICA Projects/ Activities and Demonstration Survey (PoC) for Proposing Improvement Plans

In the Demonstration Survey (PoC), the target contents and projects/activities were selected in a manner that would contribute to the Study objective that is "to propose methods for preparing and firmly establishing the ICT environment for project/activity implementation and systems for remote implementation utilizing DX technology."

Process 6-1 Survey of Conditions in Candidate Target Countries for Demonstration Survey (PoC)

Concerning the Study target items decided in [Work 2], conditions in multiple Demonstration Survey (PoC) target countries were confirmed according to each item. Specifically, based on the questionnaire surveys implemented in Process 2-3 and Process 3-2 in Table-3, remote implementation issues were sorted and grouped and the degree of priority was sorted according to the level of need for addressing the issues on sites. Candidate cases and survey plans for Process 6-2 were created.

Process 6-2 Identification of Demonstration Survey (PoC) Contents and Formulation of Implementation Plan for Demonstration Survey (PoC)

Questionnaire surveys, hearing surveys, etc. were implemented to confirm conditions with officials involved in the candidate Projects/ Activities with a view to identifying the Demonstration Survey (PoC).

Table-4 Demonstration Survey (PoC) Candidate Projects/ Activities and Methods for Confirming Conditions

Type of Project/ Activity	Candidate Project/ Activity	Method for Confirming Conditions
Training Programs	・ Knowledge Co-Creation Program (KCCP) (Country Focus): 1 case (Colombia) ・ Training Program for Nikkei Communities: 1 case ・ Third Country Training Program (TCTP) : 1 case (Chile)	・ Implementation of hearings with JICA persons in charge and training implementation agencies
Technical Cooperation Projects	・ 2 cases (Latin America and the Caribbean, Colombia)	・ Implementation of hearings with experts
ODA Grant and ODA Loan Projects	・ ODA Loan: 3 cases (all in Brazil) ・ ODA Grant: 1 case (Jamaica)	・ Questionnaire survey with implementation agencies (ODA Loan) ・ Implementation of hearings with JICA persons in charge

Upon confirming whether cooperation could be obtained from the local C/P agencies, experts, consultants, JICA Overseas Offices and training implementation agencies in Japan (in case of Demonstration Survey (PoC) targeting training in Japan), the targets and contents of the Demonstration Survey (PoC) were confirmed and the implementation plan was formulated.

Process 6-3 Implementation of Demonstration Survey (PoC)

The 4 Demonstration Survey (PoC) were implemented based on the plan compiled in [Process 6-2].

Table-5 Implemented Demonstration Survey (PoC)

No.	Name of Demonstration Survey (PoC) (Target Project/Activity)
1	Utilization of LMS and Creation of guidelines for Knowledge Co-Creation Program (KCCP) (Country Focus), Training Program for Nikkei Communities, and Third Country Training Program (TCTP), etc. (Colombia Knowledge Co-Creation Program (KCCP) (Country Focus) "Education in Japan of Colombian Exerts on Productivity Management", Chile Third Country Training Program (TCTP) "Development of capacities in the incorporation of the DRR approach to public investment projects")
2	Data Acquisition and Communication using (Low Bandwidth) IoT in Areas that have a Fragile Internet Environment (Technical Cooperation Project "Project for Capacity Development on Integrated Management and Conservation of Biodiversity at regional level in SICA Region")
3	Site monitoring in ODA Grant and ODA Loan projects (Brazil ODA Loan "Environmental Improvement Project in the Basin Lake Billings")
4	Improvement of IT Literacy of Staff in JICA Overseas Offices

Process 6-4 Evaluation and Analysis of DEMONSTRATION SURVEY (POC)

The implemented Demonstration Survey (PoC) were evaluated and analyzed; the findings were fed back to the C/P agencies, experts, consultants, and staff in JICA Overseas Offices, etc., and the effects were confirmed.

The results of Demonstration Survey (PoC) were reported to the JICA Latin America and Caribbean Department, related divisions in JICA headquarters, and JICA Overseas Offices in the countries where the Demonstration Survey (PoC) were implemented, and they were reflected as Chapter 4 in the DFR and FR. (Explanation was conducted in the webinar in [Process 8-4]).

[Work 7] Preparation of Draft Final Report (DFR) and Final Report (FR)

Process 7-1 Preparation of Draft Final Report (DFR)

The above Study findings were compiled into the DFR. Contents of the DFR were explained to the JICA Latin America and Caribbean Department, related divisions in JICA headquarters, and JICA Overseas Offices in Latin America and the Caribbean, and feedback was received from the stakeholders. Explanation was conducted in webinar (5) in [Process 8-5]).

Process 7-2 Preparation of Final Report (FR)

The FR was prepared based on the feedback received from the stakeholders to the DFR. After that, FR was given to the JICA Latin America and Caribbean Department, related divisions in JICA headquarters, and JICA Overseas Offices in Latin America and the Caribbean. (Explanation was conducted in webinar (6) in [Process 8-6]).

[Work 8] Holding of Webinars

Process 8-1 Webinar (1)

Contents	Explanation of the Study draft policy and Study methods
Targets	JICA Latin America and Caribbean Department, related divisions in JICA headquarters, JICA Overseas Offices in Latin America and the Caribbean (Japanese staff, local staff, etc.)
Language	Japanese, Spanish

Process 8-2 Webinar (2)

Contents	Seminar for reporting on and explaining survey of the following items ・ Conditions of remote training implemented by JICA and Countermeasures ・ Confirmation of implementation status of online KCCP (Group and Region Focus) and examination of countermeasures by improvement of ICT environment (progress status) ・ Confirmation of conditions of ICT environment for remote training and examination of countermeasures (progress status)
Targets	JICA Latin America and Caribbean Department, related divisions in JICA headquarters, related JICA Domestic Offices, JICA Overseas Offices in Latin America and the Caribbean (Japanese staff, local staff, etc.)
Language	Japanese, Spanish

Process 8-3 Webinar (3)

Contents	Seminar for reporting on and explaining survey of the following items: ・ Explanation of the formulated “Plan for Improving the Implementation Structure of Remote Training” ・ Explanation of the plan for ICT environment improvement and tools utilization for remote training ・ Demonstration Survey (PoC) implementation plan
Targets	JICA Latin America and Caribbean Department, related divisions in JICA headquarters, related JICA Domestic Offices, JICA Overseas Offices in Latin America and the Caribbean (Japanese staff, local staff, etc.)
Language	Japanese, Spanish

Process 8-4 Webinar (4)

Contents	Seminar for reporting on and explaining survey of the following items ・ Results of Demonstration Survey (PoC)
Targets	JICA Latin America and Caribbean Department, related divisions in JICA headquarters, related ICA Domestic Offices, JICA Overseas Offices in Latin America and the Caribbean (Japanese staff, local staff, etc.), Demonstration Survey (PoC)-related officials (relevant persons in JICA and experts dispatched for the target Projects/Activities)
Language	Japanese, Spanish

Process 8-5 Webinar (5)

Contents	Reporting of Draft Final Report (DFR)
Targets	JICA Latin America and Caribbean Department, related divisions in JICA headquarters, related ICA Domestic Offices, JICA Overseas Offices in Latin America and the Caribbean (Japanese staff, local staff, etc.) Demonstration Survey (PoC)-related officials (relevant persons in JICA and experts dispatched for the target Projects/Activities), Demonstration Survey (PoC)-related external agencies (local C/P agencies and Project/Activity implementation agencies, training subcontractors)
Language	Japanese, Spanish

Process 8-6 Webinar (6)

Contents	Reporting of Final Report (FR)
Targets	JICA Latin America and Caribbean Department, related divisions in JICA headquarters, Latin America Project/Activity-related persons (including experts, consultants, training subcontractors and other related external persons), (JICA Overseas Offices in Latin America and the Caribbean)
Language	Japanese, Spanish

[Work 9] Public Information

Process 9-1 Contributions to professional journal

An article concerning the activities of this Study was contributed to "Informacion Latinoamericana No.1436(Fall Edition)" [2], which is issued by the Japan Association of Latin America and the Caribbean.

[2] https://latin-america.jp/archives/50443

2. Situation and Issues regarding Remote Implementation of JICA Projects/ Activities in Latin America and the Caribbean (FY2020 and FY2021)

Based on the results obtained from the questionnaire surveys of 23 Overseas Offices in Latin America and the Caribbean, additional questionnaire surveys of persons in charge of Projects/Activities, the Technical Cooperation experts and the training implementation agencies, and hearing surveys of officials in JICA Domestic Offices, JICA Overseas Offices and JICA Headquarters, conditions and issues regarding the remote implementation of JICA Projects/ Activities were compiled.

2.1 Situation and Issues regarding Remote Implementation of Training Projects/ Activities

(1) Situation regarding Remote Implementation of the Knowledge Co-Creation Program (KCCP) (Country Focus)

As far as could be grasped in the Study, 10 Projects/Activities under the Knowledge Co-Creation Program (KCCP) (Country Focus) were planned for implementation Latin America and the Caribbean in FY2020. One of these entailed remote implementation of follow-up from 2019, and 3 (1 of which targeted one person only) were remotely implemented in the shape of additional implementation of Knowledge Co-Creation Program (KCCP) (Group and Region Focus), however, the other Projects/Activities were postponed.

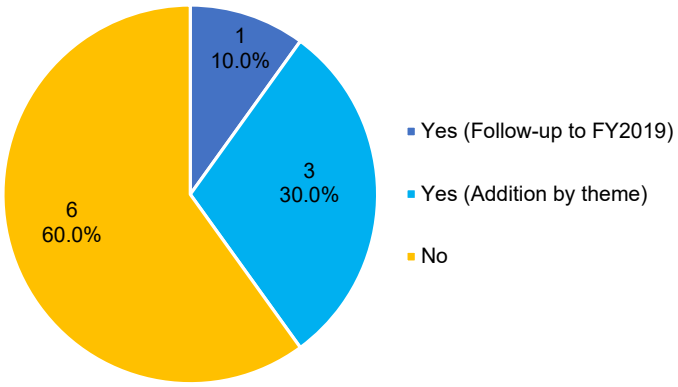


Figure-3 Situation regarding Remote Implementation of Knowledge Co-Creation Program (KCCP) (Country Focus) in FY2020

Concerning the reasons why remote implementation was not possible in FY2020, the following multiple responses were given.

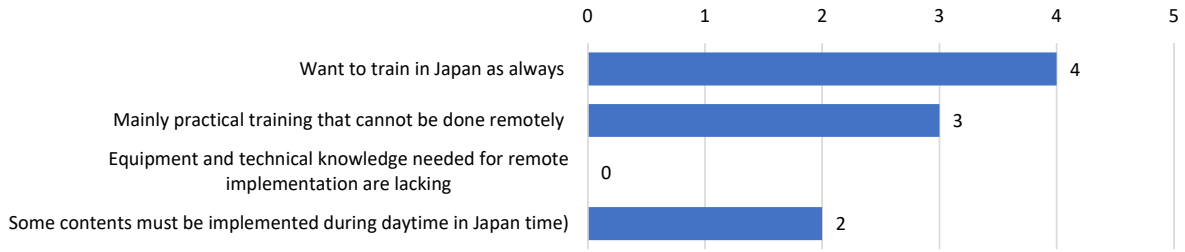


Figure-4 Reasons for Inability to Remotely Implement the Knowledge Co-Creation Program (KCCP) (Country Focus) in FY2020

Analysis

- There were no Projects/Activities that lacked the equipment and technical knowledge needed for remote implementation. It is thought that the Projects/Activities comprised contents that were unsuitable for remote implementation from the start.

As far as could be grasped in the Study, 15 Projects/Activities were planned for implementation in FY2021. On inquiring about remote implementation plans with persons in charge and training subcontractors (May 2021), it was found that there 6 Projects/Activities planned for remote implementation, 4 Projects/Activities planned for remote implementation as an addition to the Knowledge Co-Creation Program (KCCP) (Group and Region Focus), 3 Projects/Activities where remote implementation is difficult, 1 Project/Activity that will be implemented only as training in Japan, and 1 Project/Activity in which no training will be implemented.

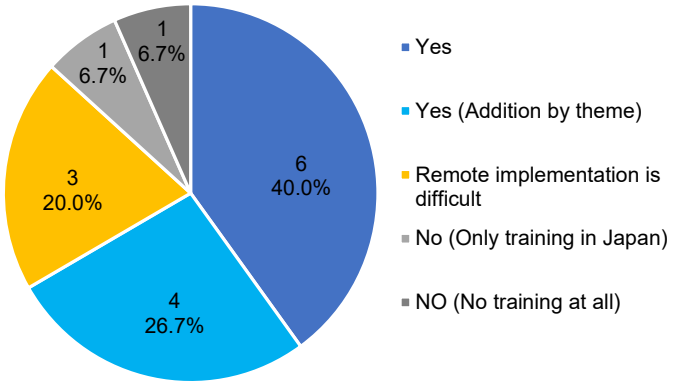


Figure-5 Plans for Remote Implementation of the Knowledge Co-Creation Program (KCCP) (Country Focus) in FY2021

Concerning the 3 Projects/Activities where it was responded that remote implementation is difficult, the following reasons were given (multiple responses): remote implementation is not possible because the training is mainly practical (2 responses); it is hoped to conduct training in Japan as always (1 response); and the time difference is a problem (there are contents that must be implemented during daytime in Japan) (1 response)[3].

[3] Information from the JICA person in charge as of January 2022

(2) Situation regarding Remote Implementation of the Training Program for Nikkei Communities

According to data provided by the JICA Latin America and Caribbean Department (as of January 15, 2021), out of a total of 112 training courses in FY2020, 24 courses were planned for remote implementation, 5 courses were planned for implementation as remote seminars, 1 course was under review (as of January 5), and 82 courses were not implemented.

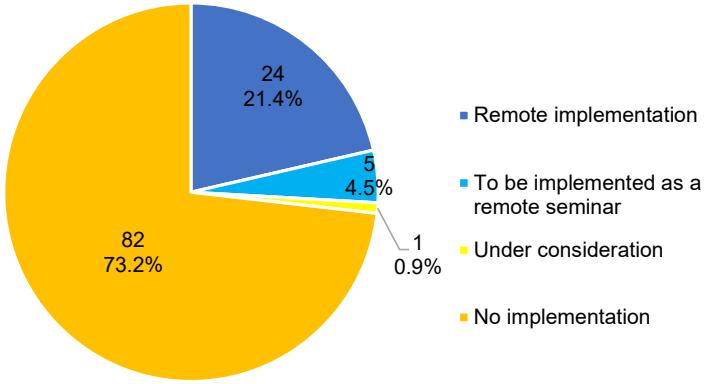


Figure-6 Situation regarding Remote Implementation of Training Program for Nikkei Communities in FY2020

Out of a total of 112 training courses, 37 were group courses, of which 19 were planned for remote implementation; hence, more than half of the courses were planned for remote implementation. Concerning 41 individual short-term courses, only 3 were planned for remote implementation, while out of 34 individual long-term courses, only 2 were planned for remote implementation.

Analysis	・ The difference between group courses and individual courses in terms of the remote implementation rate arises because group courses comprise a lot of classroom learning and lecture programs that can be replaced with online training, whereas individual courses comprise a lot of practical training and OJT that is difficult to implement online.

According to data provided by the JICA Latin America and Caribbean Department in April 2021, there are 110 courses in FY2021. On asking persons in charge and groups proposing training about plans for remote implementation (as of May 2021), 17 courses are planned for remote implementation; 10 courses have plans for remote seminars; remote implementation is difficult in 18 courses; and there was no response from 65 courses.

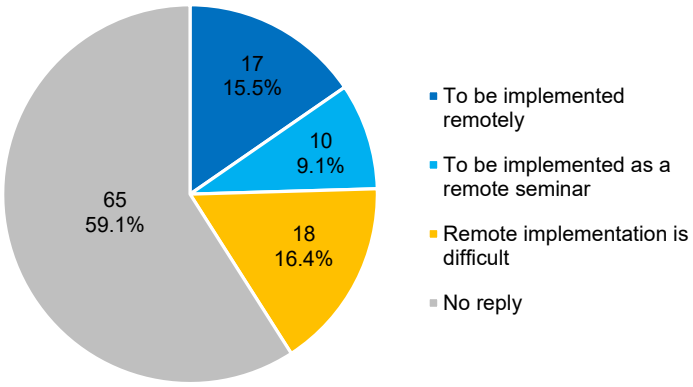


Figure-7 Plans for Remote Implementation of the Training Program for Nikkei Communities in FY2021

Concerning the training for which remote implementation was not possible in FY2020 and is difficult inFY2021, the following responses were given.

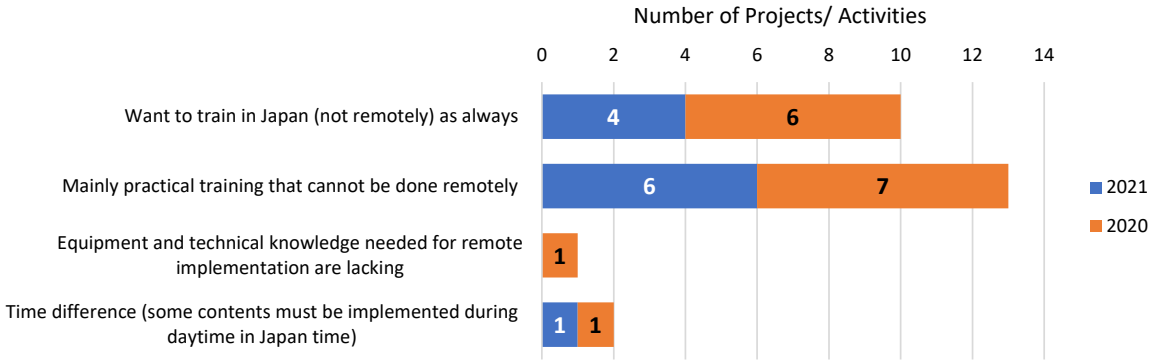


Figure-8 Reasons for Inability to Remotely Implement the Training Program for Nikkei Communities (FY2020/2021)

Analysis

- As in the case of the Knowledge Co-Creation Program (KCCP) (Country Focus), the main reason given is that the contents of the training are not suited to remote implementation.
- In addition, the individual responses included comments such as “If the training is done remotely, I don’t want to participate”, and there were cases where there were not enough prospective participants to make the training viable. Accordingly, in the Training Program for Nikkei Communities especially, the opportunity of coming to Japan provides a major incentive, and there is a tendency to avoid the training if it is done remotely.

(3) Situation regarding Remote Implementation of the Third Country Training Program (TCTP)

As far as could be grasped in the Study, 15 courses under the Third Country Training Program (TCTP) were planned for implementation in Latin America and the Caribbean in FY2020. Of these, 4 courses were implemented as remote training only, and 1 was implemented as a combination of remote training and face-to-face training. In each case, online meeting tools such as Zoom and

Microsoft Teams were used for conducting the remote training in real-time as opposed to on-demand.

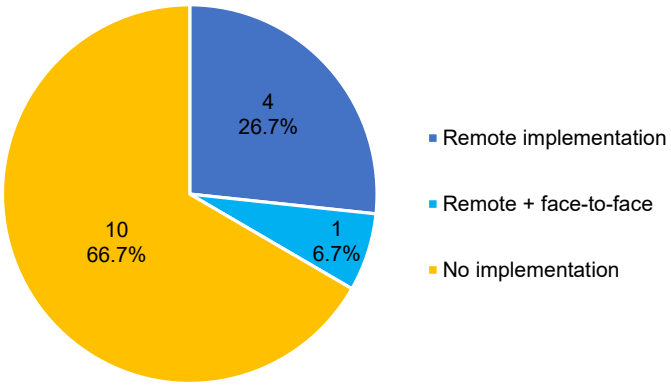


Figure-9 Situation regarding Remote Implementation of Third Country Training Program (TCTP) in FY2020

Análisis

- Decisions concerning implementation of the Third Country Training Program (TCTP) are made not only by JICA but in consultation with the governments of counterpart countries. In FY2020, it seems that courses were implemented when JICA and the counterpart government quickly determined that the only way was to implement remotely, however, they did not reach the implementation stage in cases where decisions were postponed due to COVID-19 or where there was hesitation about implementing remotely.

As far as could be grasped in the Study, 28 courses were planned for implementation in FY2020. On asking persons in charge and training implementation agencies about plans for remote implementation (as of May 2021), it was found that 24 courses are planned for hybrid implementation comprising remote training and face-to-face training; remote implementation is difficult in 1 course; no training will be implemented in 1 course; 1 course is still under examination; and there was no response from 1 course.

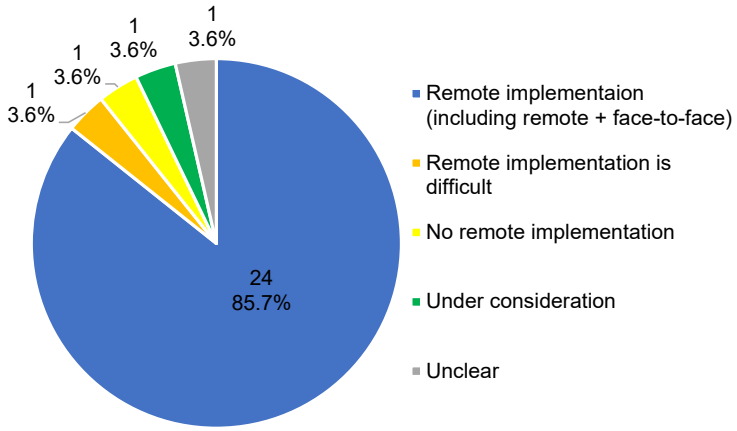


Figure-10 Plans for Remote Implementation of the Third Country Training Program (TCTP) in FY2021

In the course that indicated remote implementation is difficult, the following reasons were given: most of the participants are situated in areas with poor internet access where there is no custom of taking online courses, moreover, the government of the counterpart country thinks that online training is not enough for the participants to fully understand the contents.

In the course where it was indicated that no training will be implemented, the following reason was given: notification of adoption by the Government of Japan did not arrive in time for the counterpart to make a budget application.

Concerning the courses where it was indicated that remote training could not be implemented in FY2020 and will be difficult in FY2021 (including courses that will be partially implemented remotely but will also need to be partially conducted face-to-face), the following results were obtained when inquiring about the reasons.

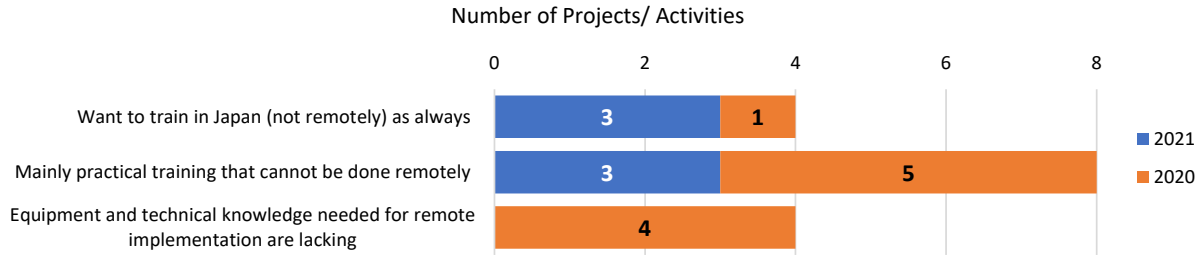


Figure-11 Reasons for Inability to Remotely Implement the Third Country Training Program (TCTP) (FY2020/2021)

Analysis

- As is also the case in the Knowledge Co-Creation Program (KCCP) (Country Focus) and Training Program for Nikkei Communities, the main reason is that the contents of the training are not suited to remote implementation.
- From the individual responses too, in the case of training in the medical field, there were cases where one-to-one practical guidance must be given by an experienced technician for the training to be effective.

(4) Situation regarding remote implementation of training judging from the questionnaires of JICA Overseas Offices

From the questionnaire of Overseas Offices, the following reasons were cited for the success of remote implementation.

- The training contents were suited to remote implementation (10 JICA Overseas Offices)
- Appropriate IT tools were used. (8 JICA Overseas Offices)
  (Used tools: Zoom, Google Classroom, Teams, video, etc.)
- The actual fact of remote implementation was good (5 JICA Overseas Offices)
  Points in which remote implementation was better
  - ✓ Observers could participate. (2 JICA Overseas Offices)
  - ✓ Due to the on-demand mode, times could be adjusted. (2 JICA Overseas Offices)
  - ✓ In the case of the Training Program for Nikkei Communities, usually only 1 person participates, however, 8 participants could join in the case of remote implementation. (1 JICA Overseas Office)
  - ✓ Due to implementation from evening to nighttime, the normal duties of trainees were not impacted. (1 JICA Overseas Office)
- Other responses
  Training composition and method of making teaching materials
  - ✓ The training program included sessions in which the trainees could tackle the problems while holding discussions. (1 JICA Overseas Office)
  - ✓ The participants could directly send emails (to the instructors). (1 JICA Overseas Office)
  - ✓ Japanese atmosphere could be incorporated into the videos. (1 JICA Overseas Office)
  - ✓ Practical learning parts could be supplemented through making field visits (locally).(1 JICA Overseas Office)
  - ✓ Instead of local observation, video teaching materials of representative cases were produced and used in lectures. The videos included not only descriptions of the cases and site conditions, but also interviews with local residents, so thus gave the participants a more concrete image. (1 JICA Overseas Office)

  Logistics
  - ✓ Handling by staff at the Headquarters and JICA Overseas Offices was appropriate. (1 JICA Overseas Office)
  - ✓ The training programs and teaching materials were sent with ample time to spare in advance. (1 JICA Overseas Office)
  - ✓ Specific instructions could be given regarding access to the training platform and use of the teaching materials. (1 JICA Overseas Office)
  - ✓ Because the participants received contents from the JICA Overseas Offices and hotels, there was no stress regarding the communications condition. (1 JICA Overseas Office)

  Social background
  - ✓ In the midst of the COVID-19 pandemic, remote implementation has become the norm. (1 JICA Overseas Office)

Apart from the successes, the following points were cited as issues that need to be resolved.

Workload on JICA Overseas Offices
- The workload placed on JICA Overseas Offices is large (increase in the number of participants due to remote implementation, coordination with the participants, monitoring of training, etc.) (2 JICA Overseas Offices)

Periods and times of training
- Training implementation times (nighttime locally)
- Training implementation periods (training was conducted during a busy period of work for local government agencies).

Training composition and method of preparing teaching materials
- Real-time participation times should be provided to allow for discussion with other participants and clarification of queries and questions.
- More real-time Q&A sessions should be included. (E.g., when progress in on-demand teaching materials reaches 30%, 50% and 100%)
- The number of days should be increased so that the time for discussion can be expanded.

- If consecutive interpreting is adopted, lecture times should be extended.
- The same contents were repeated numerous times in different subjects within the same course.
- How to make on-demand lecture videos (It is difficult to maintain concentration if the same pace as face-to-face courses is adopted. Presentations should be displayed while showing the instructor's face. The design of presentation materials should be improved. Utilization of videos, etc.)

Communication problems
- Some participants were in locations that had a poor internet environment

Attitude of participants
- Some participants were not punctual, did not hand in assignments or respond to emails.

Analysis

- Upon simply summarizing the above issues, the issues of poor internet environment, which is the base for conducting remote implementation, time difference with Japan, and composition of training contents are thought to be significant.
- Concerning the internet environment and time difference, it is possible to realize improvement through introducing the appropriate equipment and ICT tools, whereas concerning the issue of composition of training contents can be improved through compiling contents that are suited to remote training.

(5) Conditions, issues and countermeasures regarding remote implementation of training

From the findings of the questionnaire and hearings on Study item 1, it is considered important to consider the following points when remotely implementing JICA training.

Issues and countermeasures

- The participants seem to prefer real-time training to on-demand training. Therefore, even in cases where mainly on-demand training has to be conducted due to the time difference, it is advisable to incorporate discussions and other activities that can be participated in by all trainees as much as possible. If it is difficult to connect with Japan in real-time, it is sufficient to include time for group work between the participants. In this case, it is better to arrange the group work between participants from the same country. When setting group work times, in the case of the Knowledge Co-Creation Program (KCCP) (Group and Region Focus), it will be necessary to have at least two participants from one country. If there is only one participant from a country, it will be necessary to take steps such as having a returning trainee take part and so on.
- Even when conducting real-time training, it is better to record lecture videos in advance. Rather than having an instructor give live lectures, it is better to play lecture videos via an online conference (Zoom, etc.) and have all the participants watch them together. After watching a video, all the participants can then have a Q&A session. If training is conducted in another language than English (Spanish or French), since the instructors often cannot speak the language, if live lectures are conducted, it is necessary to include consecutive interpreting and this takes twice as much time. If videos are recorded in advance, dubbing can be added to the videos, thereby enabling lecture times to be shortened. If real-time training is conducted for Latin America, since the training takes place late at night in Japan time, recording videos in advance will reduce the load on the Japanese side. Moreover, recorded lecture videos can be used again and again. If trainees are unable to attend training in real-time due to network troubles and so on, they can still watch the lecture videos later.
- Participants find training that entails simply watching the recorded contents of real-time training to be the most tedious. Especially if the training is conducted in another language than English (Spanish or French), since it is necessary to include consecutive interpreting, it takes even longer and it becomes difficult to sustain motivation. Accordingly, it is desirable to record and dub lecture videos in advance. Concerning discussions, in cases where it is difficult for all the participants to gather face to face, it is possible to conduct debate by using a bulletin board tool.

Issues and countermeasures	・ Whatever the training pattern, it is important to boost the motivation of the participants. In addition to simply having the participants submit reports on issues and return them with comments, making them introduce their contents to the other participants can boost their motivation. ・ Instead of site inspections, preparing videos in advance and showing them to the participants was very useful for promoting their understanding. However, it is necessary for JICA and the training contractors to coordinate the ownership rights for videos in advance. ・ Especially in the case of real-time training, in preparedness for network troubles, etc., it is important to assign IT staff. Moreover, it is desirable to connect all participants with two lines, for example, using Zoom or Teams to conduct training on PCs, while using WhatsApp on smartphones to enable communications. ・ It is desirable to have staff who can support trainees during late night in Japan (daytime locally).If contractors do not have such personnel, the role could be filled by national staff of the JICA Overseas Offices or returning trainees. ・ Concerning cases where it is difficult for participants to participate in remote training due to problems in the ICT environment, rather than problems in ICT devices (participants don't own PCs or they only have old models, etc.), problems with the internet environment (unstable or slow internet) in the place where receiving training are more conspicuous. In such cases, it is considered realistic to have participants receive training in JICA offices or hotels that are fully equipped with stable internet lines and backup power supply. If participants live far away from the capital city, it may also be possible for them to use the training center, etc. of a C/P agency in the nearest regional city. If it is possible to download teaching materials in on-demand training, another option is for the JICA Overseas Offices to download teaching materials and copy them onto DVD, etc. for lending to the participants.

Moreover, it is considered important to consider the following points especially when implementing the Third Country Training Program (TCTP).

Issues and countermeasures	・ The Third Country Training Program (TCTP) that was remotely implemented in fiscal 2020 was entirely conducted in real-time using online meeting tools such as Zoom, Teams, etc., and it was generally successful. Concerning the real-time training that was successful in fiscal 2020, there is no need to unreasonably introduce LMS and switch to on-demand training in fiscal 2021. ・ Concerning the countries that have expressed the desire to introduce the LMS, it is necessary to confirm their intentions upon understanding the merits and demerits of introduction. ・ Concerning Brazil and Argentina, since there is the Third Country Training Program (TCTP) targeting Africa, it is necessary to examine whether to implement it in real-time or on-demand. ・ When introducing the LMS, if the training implementation agencies (C/P agencies) have experience of using LMS, it is more efficient and realistic for the C/P agencies to use the LMS that they are accustomed to. If it is intended for created contents to be reused in completely different training by JICA in the future, it will be necessary to consult with the C/P agencies. ・ If C/P agencies have no experience of using a LMS, they can use external LMS including JICA-VAN. Decisions about whether or not to introduce should be made upon understanding the support structure and languages of the LMS (whether manuals are written in the local language and so on) and limitations imposed by JICA's security rules and so on. ・ It is important to take ample preparation time for the implementation of remote training. As in the case of Panama, it is desirable to consider various cases (case where curfew is lifted/case where curfew is not lifted, case where the host side gathers in a hotel/case where the host side gathers in the JICA Overseas Office, etc.) and prepare action plans for each case. ・ One office has constructed and operates its own e-learning system, however, this is used not for the Third Country Training Program (TCTP) but a different objective. This is useful for building a network between returning trainees and is considered to be an effective method for utilizing the LMS.

2.2 Situation and Issues regarding Remote Implementation of Non-training Projects/ Activities (Technical Cooperation and ODA Loan/ODA Grant)

2.2.1 Technical Cooperation Projects

(1) Situation regarding remote implementation

As far as could be grasped in the Study, 129 Projects/ Activities[4] are planned for implementation as Technical Cooperation Projects/ Activities in Latin America and the Caribbean in FY2021. According to the questionnaire conducted in May 2021, some form of remote implementation has been (or will be) adopted in 53 Projects/ Activities; there will be no remote implementation in 4 Projects/ Activities; and the situation was unclear or work had not yet been started in 72 Projects/ Activities. The 4 Projects/ Activities which responded that remote implementation would not be adopted had not yet been started.

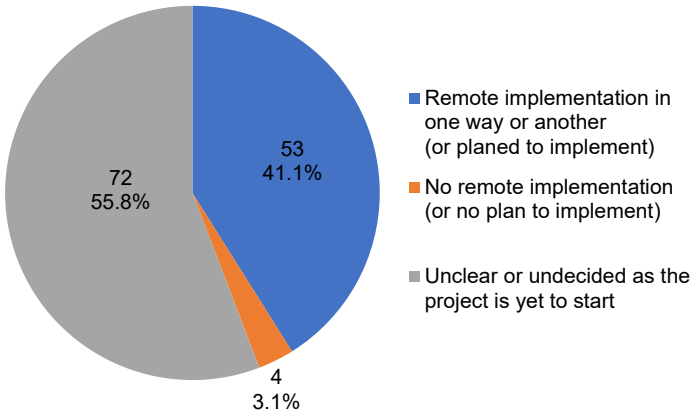


Figure-12 Plans for Remote Implementation of Technical Cooperation Projects/ Activities in FY2021

From the questionnaire of Overseas Offices, the following cases were cited as good examples of remote implementation utilizing IT tools in Technical Cooperation Projects/ Activities.

1. Seminars and workshops utilizing online meeting tools such as Zoom
   - Meeting to exchange opinions between Japanese indigenous people (Ainu) and local residents (Argentina, Technical Cooperation Project)
   - Implementation of intraregional seminar also connected to Japan (Costa Rica Grassroots Technical Cooperation Project)
   - Workshop on prevention of COVID-19 for persons engaged in community-based tourism, and seminar for sharing knowledge among returning trainees in the tourism field. (Dominican Republic, Technical Cooperation Project)
   - Intraregional online training by a terrestrial digital expert (individual expert) (Peru)
   - Staging of more than 10 intraregional webinars by alumni of returning trainees concerning public health and medical care, solid waste management, disaster prevention, etc. in the midst of COVID-19 (Peru)
   - Online seminar on Semi Aerobic Landfill Site (Fukuoka Method) (El Salvador, lecture by an expert) (Peru)
   - Online training for OVOP producers (Webinar) (Honduras)

[4] 87 projects and 42 individual experts

2. Meetings and technology transfer utilizing online meeting tools such as Zoom
   - Online training for CPs by a team of experts (Argentina, Technical Cooperation Project)
   - Remote support for pilot companies (Argentina, Technical Cooperation Project)
   - Extension activities by CP agency for related agencies and general citizens, with feedback by an expert in Japan (Ecuador, Technical Cooperation Project)
   - Monitoring and online meeting for follow-up (Colombia training)
   - Staging of a virtual ceremony for handing over equipment (Colombia, Follow-up Program)
   - Staging of periodic online meetings for researchers (Chile, SATREPS)
   - Staging of online meetings, technology transfer by Japanese experts (Chile, Technical Cooperation Project)
   - Staging of periodic online meetings by Japanese experts and CPs (Dominican Republic, Technical Cooperation Project)
   - Online training for CPs and periodic online meetings (Dominican Republic, Technical Cooperation Project)
   - Online training for clinic staff by short-term experts (Paraguay)
   - Remote training from Japan (Peru,Technical Cooperation Project)
3. Remote monitoring of pilot companies by an expert using a 360 degree camera and smart glass (under preparation) (Argentina, Technical Cooperation Project)
4. R/D remote negotiation between JICA Headquarters and CP agencies (Ecuador, Colombia)
5. Remote instructions for CPs and local consultants (used tools are unknown) (Jamaica, Nicaragua)

Analysis

- In Technical Cooperation Projects/ Activities, there were numerous cases where online meeting tools such as mainly Zoom were used, and the experts and CP agencies adopted creative measures to conduct remote implementation.
- Apart from online meeting tools, cases of using 360-degree cameras and smart glasses for remote monitoring of local companies by experts in Japan could be referenced in other Projects/ Activities.

(2) Specific examples of remote implementation

OVOP (one village one product) Technical Cooperation projects/Activities are conducted in numerous countries in Latin America. In such cases, OVOP producers live in various areas and project activities are scattered, meaning that problems exist with the internet environment. Accordingly, OVOP activities were confirmed in greater detail as examples of wide area aid. The following results were obtained.

- In the case of the OVOP in Honduras, the OVOP producers do not live in such a remote area. Most of the OVOP producers do not own a PC, however, they can participate in online meetings by using Zoom on a smartphone. When taking part in online training, it is also possible to do so from home using a smartphone, but trainees can go to the local community center and take part using a PC installed there.
- In the case of the OVOP in Argentina, the OVOP producers do not own PCs and they live in remote areas that have a poor internet environment. When they take part in online training, it is considered realistic for them to go to a nearby city and use the equipment provided by the C/P agency.

Analysis

- In OVOP, communication in areas of poor internet environment is sometimes an issue.
- Apart from OVOP, there are other Projects/ Activities where the beneficiaries live in remote areas (e.g. rural development projects benefitting residents in conflict-affected areas, etc.), hence communication in such areas is an issue.

2.2.2 ODA Loan/ODA Grant Projects

(1) Situation regarding remote implementation

From the questionnaire of Overseas Offices, the following cases were cited as good examples of remote implementation utilizing IT tools in ODA Loan/ODA Grant Projects.

ODA Grant Projects
- Remote instructions from Japan (Jamaica)

ODA Loan Projects
- Preparation of a video for giving a detailed introduction to tender works for showing site conditions to prospective bidders who cannot go to the site (Nicaragua)
- Communication has been improved between Headquarters and JICA Overseas Offices, and monitoring has become easier. (Honduras)

From hearings conducted in multiple Projects/ Activities, major issues were found to exist regarding the monitoring of sites amidst the COVID-19 pandemic.

- In Brazil, the Office staff can no longer visit ODA Loan sites and are struggling to monitor sites due to the COVID-19 pandemic.
- There are numerous ODA Loan projects in Peru, and many of these are implemented in regional areas. Therefore, it is difficult to conduct monitoring in cases of Projects/ Activities where the sites are scattered in the regions. In Projects/ Activities that employ local consultants, the local consultants monitor the sites, however, even the local consultants cannot go into the field during lockdowns.

Analysis

- In ODA Loan/ODA Grant, it can be confirmed that there are needs for remote implementation and countermeasures regarding communication with implementation agencies and monitoring of sites.

2.3 Current Conditions and Issues regarding ICT Environment in Countries with JICA Overseas Offices and Project/ Activity Sites

Regarding the current conditions and issues of Project/ Activity sites described in the preceding sections, confirmation was implemented on current conditions and issues in the ICT environment of JICA Overseas Offices and host countries that implement remote Projects/Activities and the situation regarding ICT literacy of related officials.

(1) Current conditions and issues regarding ICT environment in Overseas Offices

1) ICT staff in offices

On asking if there any staff members in charge of ICT in the Office (staff who can perform PC setup, network configuration, and troubleshooting), 15 Offices answered that the employees or national staff members include no persons in charge of ICT; 13 Offices answered that they have external contracted persons in charge of ICT; 9 Offices answered that they have both; and 4 Offices answered that they have no persons in charge of ICT.

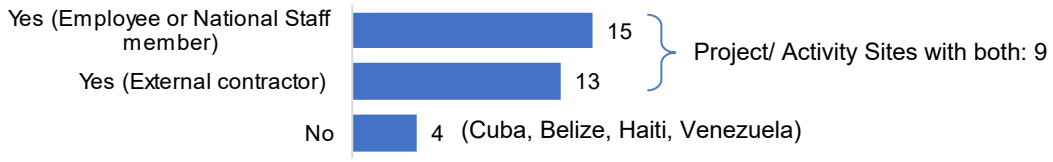


Figure-13 Are there any staff members in charge of ICT?

Analysis

- Concerning the offices that have no staff members in charge of ICT (Cuba, Belize, Haiti, Venezuela), if budget is available, they should assign external contractors even if they are not permanent. For example, by contracting staff to visit the office once a week or whenever a problem arises (on-demand), such offices can receive ICT support without great outlay.
- However, there are also cases where such small offices find it difficult to implement autonomous measures. Therefore, as an alternative measure, it may be effective in terms of cost effectiveness for all offices in the Spanish linguistic region of Latin America and the Caribbean to sign a blanket contract with a single ICT support company and build a structure whereby any office can receive online ICT support.
- Also, it may also be effective to create a chat group or online bulletin board open to all JICA Offices in Latin America and the Caribbean so that staff members can communicate and provide mutual support to each other and share ICT issues, lessons and know-how specific to JICA-VAN and JICA.

2) Speed of internet line from the Office (not the JICA line)

Offices were asked to access an internet line connection test site (fast.com) using the Office internet line (not JICA line) and investigate their communication speed. Figure-14 shows the bandwidths of 23 JICA Overseas Offices, and Figure-15 shows a comparison of internet latency.

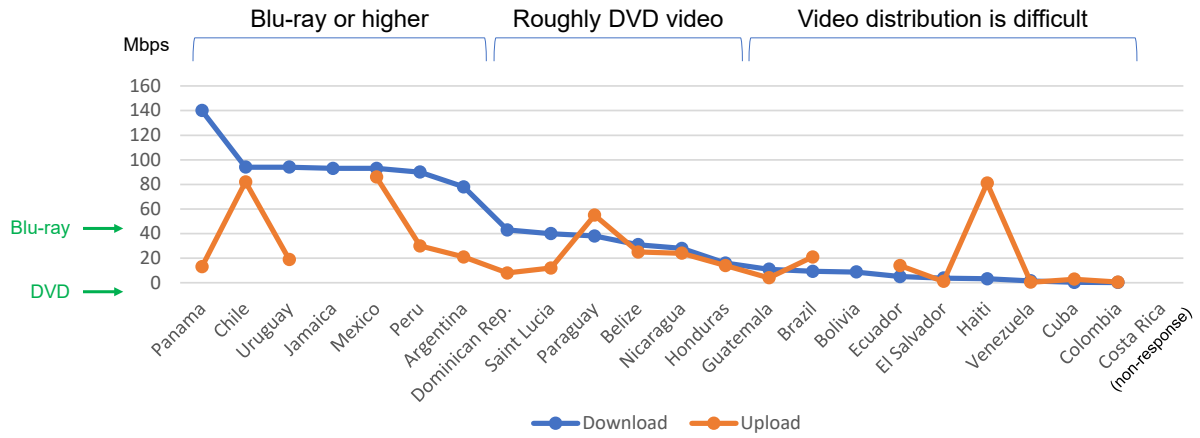


Figure-14 Bandwidths of Internet Lines from Offices

Analysis

- Assuming the implementation and viewing/listening of online training, the viewing quality of videos becomes the most important factor. Accordingly, the above figure is indicated to give a comparison between the bandwidth level of DVD videos (approximately 11Mbps) and Blu-ray videos (approximately 54Mbps). Moreover, as is clearly shown above, internet lines generally tend to be faster in the downward (download) direction and slower in the upward (upload) direction. Accordingly, even if a pleasant speed is realized when viewing a video (downward direction), it is possible that adequate speed cannot be realized when uploading videos from a JICA Overseas Office (upward direction).
- Moreover, because these bandwidths only express values at measurement points, it should be noted that the actual bandwidth may be better in cases where numerous users were using the same line at the same time. To measure the bandwidth with greater accuracy, it is necessary to measure the state when nobody else is using the internet.
- In general, when optical lines are used, the disparity between bandwidths in the upward direction and downward direction often tends to be small. Since the bandwidth in the upward direction is extremely small when using old-type lines such as ADSL, there is a strong possibility that problems will arise in video conferences, etc. If optical line services are locally available, optical lines should be introduced.

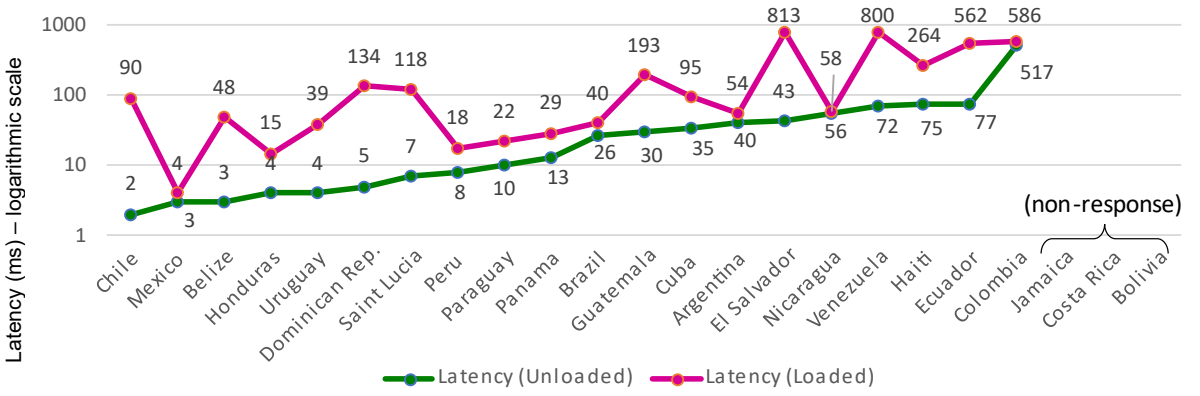


Figure-15 Latency of Internet Lines from Offices

Analysis

- Latency denotes the delay time required for internet data to reach a destination from a transmission source. The shorter the time, the quicker data is transmitted without delay, which means there is less time lag when having conversations in video meetings, etc. If the delay time exceeds 500ms as in the case of Colombia in the above figure, since this means that it will take 0.5 seconds or longer for spoken words to reach the other side, which means that the time lag in both directions will be 1 second or longer, it is possible that conversations will not proceed smoothly.
- Also, "Unloaded" indicates the delay when the line is vacant, while "Loaded" is the delay when the line is busy, and a small disparity between the two is an indicator that excellent line equipment is being used. On lines such as in El Salvador and Venezuela, where the delay becomes larger when the line is "Loaded", i.e., being used by numerous users, delays in conversations become much worse (almost 1 second) when multiple users simultaneously use the line from the same Project/ Activity Site.

3) Situation regarding Office power interruptions

Offices were asked about the frequency and average length of power interruptions. The following graph shows a comparison of power interruptions in the 23 JICA Overseas Offices.

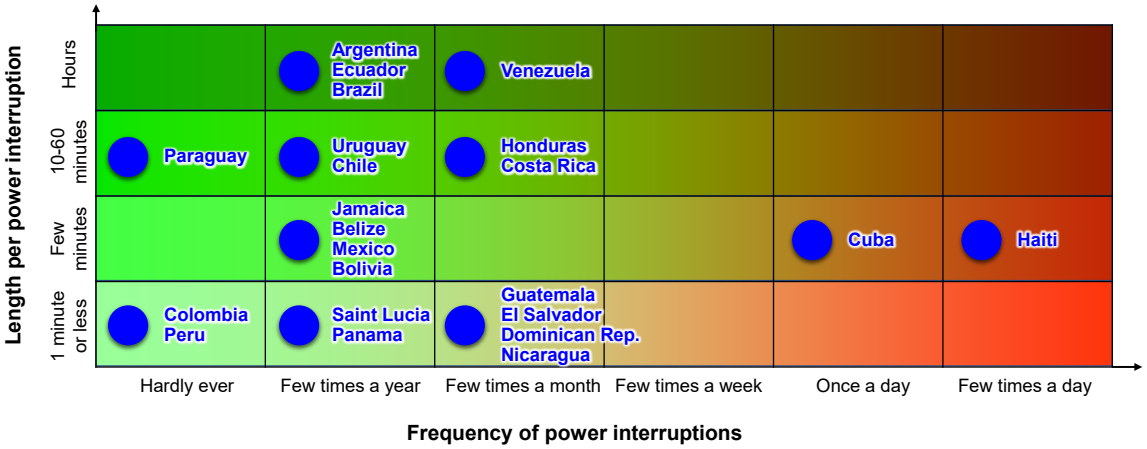


Figure-16 Power Interruptions in JICA Overseas Offices

Analysis

- The frequency of power interruptions increases the further one goes to the right in the above figure; moreover, the length of each power interruption increases the further one goes upwards. Therefore, the lower left indicates the best situation regarding power interruptions, while the upper right denotes the worst case.
- It can be gathered from the figure that Haiti and Cuba experience frequent power interruptions, and that the frequency is not so high in Venezuela, Argentina, Ecuador and Brazil, although it can take a few hours for a single power interruption to be fixed.
- Concerning the JICA Overseas Offices where power interruptions continue for a long time (Venezuela, Argentina, Ecuador, Brazil), it is considered effective to prepare an internet line (mobile router, etc.) that is resistant to the effects of power interruptions and thereby ensure internet access even when power is cut.

Analysis and Issues concerning the Overall ICT Environment in Overseas Offices

The contents of 1) through 3) above are summarized below.

Analysis and Issues	・ Excluding individual cases (Venezuela, Haiti, Cuba, etc.) that were cited in each of the above questionnaire items, the ICT environment in JICA Overseas Offices in general is deemed to be relatively good. ・ There are numerous JICA Overseas Offices where it is deemed that the bandwidth of internet lines is not sufficient for remotely implementing Projects/ Activities on full-scale. In all of the JICA Overseas Offices that were deemed to be at the level of "Roughly DVD" or less in internet line bandwidth, consideration should be given to reinforcing internet lines in readiness for remote implementation in the future. Also, among the JICA Overseas Offices that were deemed to be at the level of "Blu-ray or higher", since a significant number of offices do not have sufficient bandwidth in the upward direction, consideration should be given to reinforcing bandwidth by introducing optical lines and so on. ・ Also, from the viewpoint of securing information security in all of the JICA Overseas Offices, it is recommended that the operating setups for PCs, servers, etc. be reviewed and improved.

(2) Current conditions and issues concerning ICT environment in countries with JICA Overseas Offices

1) Examples where difficulty has been experienced in receiving communications from Overseas Offices due to the particularly poor internet environment on sites (including C/P agencies) in training, Technical Cooperation, ODA Grant and ODA Loan Projects.

The following table gives a summary of the responses from the JICA Overseas Offices.

Table-6 Responses from JICA Overseas Offices concerning Internet Environment

	Places where trouble was experienced				Degree of trouble				Number of projects/activities where internet problems occurred		
	Remote areas	Small towns and villages	Regional cities	Metropolitan area	Depends on time	Can hardly see websites	Cannot use email or chat	Cell phones cannot communicate	Few (10% or less)	Half or less	More than half
Haiti	●	●	●	●	●	●	●	●			●
El Salvador	●	●	●	●	●					●	
Mexico		●	●	●	●	●			●		
Cuba		●	●	●	●				●		
Venezuela	●		●	●	●	●					●
Peru				●	●				●		
Honduras	●	●	●		●				●		
Paraguay	●	●	●						●		
Panama		●	●		●				●		
Guatemala	●		●		●			●		●	
Belize			●		●				●		
Bolivia	●	●			●		●		●		
Dominican Rep.	●	●			●	●			●		
Chile	●	●				●			●		
Nicaragua	●	●			●				●		
Argentina	●						●	●	●		
Brazil	●							●	●		
Costa Rica	●				●				●		
Uruguay	●				●				●		
Ecuador									●		
Jamaica									●		
Saint Lucia									●		
Colombia											

Analysis

・ In this table, responding countries are rearranged according to the degree of conditions (qualitatively speaking), so countries that have experienced problems even in metropolitan and regional urban areas are placed towards the top. Moreover, the parts marked with a red dot (●) are deemed to be especially problematic areas. In addition to countries where even email and chat cannot be used or mobile phones do not work (Haiti, Guatemala, Bolivia, Argentina, Brazil), there are countries where internet problems are experienced in the majority of Projects/ Activities (Haiti, Venezuela).

Analysis and Issues concerning the Overall ICT Environment Outside of JICA Overseas Offices

Based on the above question responses and results of numerous hearings conducted in the Study, the following things can be said.

Analysis/ Proposals	・ There are quite a lot of countries (9 out of 23) where Project/ Activity sites are confronted with very poor overall internet environment that renders remote implementation impossible. Accordingly, it is considered indispensable in terms of remotely implementing Projects/ Activities to secure internet access for such sites. ・ Conversely speaking, provided that stable internet lines can be secured, it may be said that Project/ Activity sites have relatively abundant options regarding the remote implementation of Projects/ Activities.

2.4 Current Conditions and Issues concerning ITC Literacy of JICA Overseas Offices and Related Persons in Remote Implementation of Projects/ Activities

(1) Current conditions and issues concerning ITC literacy

In the questionnaire given to JICA Overseas Offices, in response to a question about how work had become more complicated due to the transition to home teleworking/remote implementation, the majority of responses pointed to problems arising from JICA's internal systems. However, as other problems, some Offices cited disparities in work efficiency arising from disparities in the IT literacy of staff members.

Training-related work 1. Problems arising from JICA's internal systems (26 JICA Overseas Offices) 2. Other problems ・ With the higher number of participants in remote training, the work of checking materials has become more complicated. (1 JICA Overseas Offices)
Technical Cooperation and ODA Grant/ ODA Loan Projects 1. Problems arising from JICA's internal systems (2 JICA Overseas Offices) 2. Other problems (communication problems) ・ There is a lack of information and instructions between Headquarters and national staff. (1 JICA Overseas Office) ・ Communication has become more difficult and more effort is required in project progress management (1 JICA Overseas Office) ・ For Japanese consultants who don't speak Spanish, it is more difficult to communicate in online meetings than face to face. (1 JICA Overseas Office)
Logistics-related work 1. Problems arising from JICA's internal systems (6 JICA Overseas Offices) 2. Problems concerning work that can only be done in offices ・ It is necessary to go to the office to obtain approval for official documents, order forms, settlements, etc., make payments to contractors, make bank deposits and so on. (2 JICA Overseas Offices) ・ Since much of the settlement work is done using paper media, it cannot be done from home. (1 JICA Overseas Office) ・ It is necessary to go to the office to conduct printing and scanning work. (3 JICA Overseas Offices) ・ Office maintenance and IT-related work cannot be done from home. (1 JICA Overseas Office) 3. Other problems (communication problems) ・ Communication within the office has become more inefficient. (2 JICA Overseas Offices)

Other work

1. Problems arising from JICA's internal systems (6 JICA Overseas Offices)
2. Other problems
   - Depending on the area of work responsibility, the frequency of commuting to the office differs between national staff members, leading to a sense of unfairness among some members. (1 JICA Overseas Office)
   - It is difficult to manage labor affairs such as overtime work and working conditions. (1 JICA Overseas Office)
   - Disparities arise in terms of work efficiency due to differences in IT knowledge between staff members. (1 JICA Overseas Office)

On asking for proposals for conducting home teleworking/remote implementation more efficiently, the following responses were given.

Improvement of existing systems

- Make it possible to access systems and shared drives from home too. (13 JICA Overseas Offices)
- Make training systems operational for 24 hours a day. (1 JICA Overseas Office)

Introduction of new systems

- Digitization and electronic signatures for the settlement system[5]. (2 JICA Overseas Offices)

IT environment construction

- Construction of IT environment in offices and homes (high-speed internet line, securing of power source, etc.) (5 JICA Overseas Offices)

IT literacy

- Resolving of disparities in IT literacy between staff members and capacity building (2 JICA Overseas Office)
- Because the Office of Information System announces the minimum PC specifications, persons who have no knowledge purchase PCs according to them. (1 JICA Overseas Office)
- Mastering and selection of methods for using tools (there are numerous similar tools and it's hard to know which ones to use) (1 JICA Overseas Office)

Enhancement of knowledge for remote implementation of work

- Implementation of online seminars for national staff for sharing experience from other countries (1 JICA Overseas Office)
- Permit participation by national staff in training courses on related themes. (1 JICA Overseas Office)
- Sort the merits and demerits of remote implementation. (1 JICA Overseas Office)
- Stage a workshop concerning efficiency of remote work (1 JICA Overseas Office)

Other

- Establish a dedicated help desk for Latin America (1 JICA Overseas Office)
- Utilize Teams groups. (1 JICA Overseas Office)

Analysis

- Judging from the questionnaire results, in many cases the national staff of JICA Overseas Offices do not have sufficient IT literacy to implement work utilizing ITC. Especially concerning teleworking from home, it was found that there is a possibility that differences will arise in work efficiency due to disparities in literacy between staff.
- Accordingly, improving the IT literacy of national staff can be said to be an important issue.

[5] JICA digitized the settlement system and introduced electronic signatures in August 2021.

3. Issues and Countermeasures concerning Remote Implementation of JICA Projects/ Activities in Latin America and the Caribbean (examination of Demonstration Survey (PoC) target Projects/ Activities)

For each Study item, the results of the questionnaires and hearings conducted thus far were analyzed, the implementation status of JICA Projects/Activities was sorted, and issues and countermeasures were compiled, thereby specifying the Demonstration Survey (PoC) targets.

3.1 Countermeasures for Remote Implementation of Training by JICA (Study Item 1)

Out of the training implemented in the JICA target areas, wide-ranging questionnaire surveys and hearings were implemented with the persons in charge of training and implementation agencies regarding the Knowledge Co-Creation Program (KCCP) (Country Focus) excluding the Knowledge Co-Creation Program (KCCP) (Group and Region Focus) for which use of JICA-VAN (introduced by JICA Headquarters) has been finalized.

3.1.1 Knowledge Co-Creation Program (KCCP) (Country Focus)

Regarding the Knowledge Co-Creation Program (KCCP) (Country Focus), responses were received from 14 JICA persons in charge, 15 Projects/ Activities (including email responses from 3 persons involved in 3 Projects/ Activities), and 2 training subcontractors involved in 2 Projects/ Activities.

(1) Remote implementation plan for FY2021

On asking about the remote implementation of training in FY2021, out of 15 responses, 10 Projects/Activities indicated that they have plans including implementation on top of the Knowledge Co-Creation Program (KCCP) (Group and Region Focus).

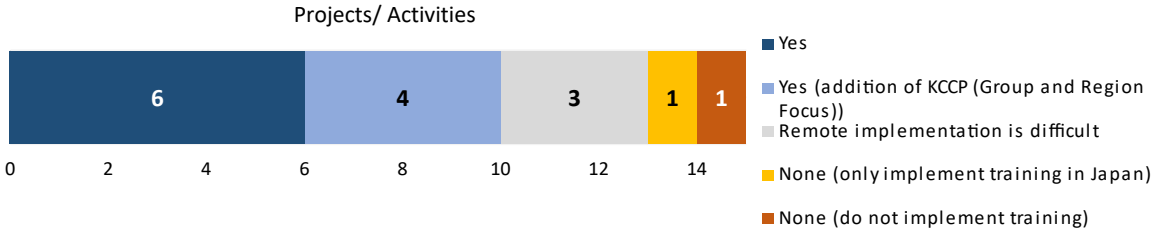


Figure-17 FY2021 Plan for Remote Implementation of the Knowledge Co-Creation Program (KCCP) (Country Focus)

Concerning 6 Projects/ Activities for which it is planned to conduct remote implementation in addition to the additional Knowledge Co-Creation Program (KCCP) (Group and Region Focus), the 3 Projects/ Activities are scheduled for implementation during the period from August to October 2021, when it is planned to conduct the Demonstration Surveys (PoC) of this Study. Out of these, only 1 Project/ Activity was a feasible target for Demonstration Survey (PoC) following consideration of all conditions.

(2) Tools that stakeholders want to use in remote implementation

On asking about the tools that stakeholders want to use when implementing remote training, the following results were obtained (integrating responses from JICA persons in charge and proposing organizations). As tools that are already scheduled for use, online meeting tools (Zoom, Teams, etc.) are by far the most common and are scheduled for use in almost all the scheduled training. In addition, file sharing tools (OneDrive, Google Drive, etc.) and chat tools (WhatsApp, etc.) are scheduled for use in roughly half of the training Projects/Activities, and similarly, online learning based on LMS is also planned for use in roughly 50% of the training. There were also 3 Projects/ Activities in which it is scheduled to utilize webinars. As a tools that are not scheduled for use but for which there is a desire to try using if training is provided, simulation based on VRR and LMS were indicated.

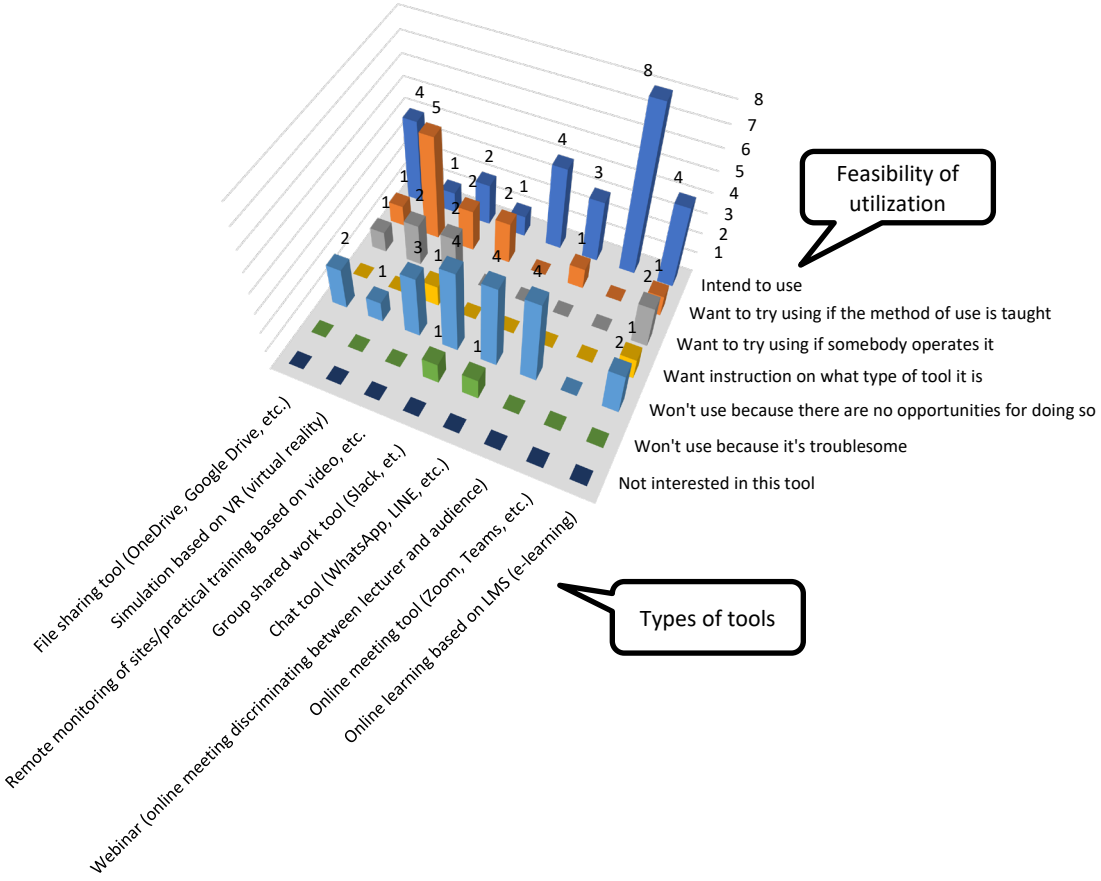


Figure-18 Promising Tools for Remote Implementation of the Knowledge Co-Creation Program (KCCP) (Country Focus)

(3) Issues and Countermeasures concerning Remote Implementation Utilizing ICT of the Knowledge Co-Creation Program (KCCP) (Country Focus)

From the above survey findings, the issues and countermeasures concerning remote implementation utilizing ICT of the Knowledge Co-Creation Program (KCCP) (Country Focus)

are as indicated in the following table. Basically speaking, the question of whether to remotely implement training should be judged according to how far the training objectives can be remotely achieved and how much of a training effect can be expected in comparison with the necessary costs and skills for using ICT tools. The details are described in Chapter 5.

Table-7 Issues and Countermeasures concerning Remote Implementation Utilizing ICT of the Knowledge Co-Creation Program (KCCP) (Country Focus)

Issues	Analysis and Countermeasures
To begin with, there is a lot of training with contents that cannot be implemented remotely (the training mainly consists of onsite practical skills or training that can only be effective if trainees come to Japan to experience it).	First, conduct the following examination to determine if remote implementation is even partially possible. ・ Can the practical training be implemented even if it is not in Japan? ・ Can training in Japan be substituted with viewing of videos and so on? ・ Can the practical training be implemented locally with conditions being checked from Japan? ・ Is it possible to teach practical training methods, let each trainee conduct the training, and then remotely evaluate the results? ・ Can VR/AR, etc. be used for virtually simulating the experience of practical training? Upon conducting the above examination, consider the possibility of revising the contents of training for remote implementation to achieve the objectives.
It is already scheduled to utilize ICT tools in the implementation of training, or ICT tools for which the desire to utilize has been expressed are just 1 out of numerous available options.	Since the training is inherently intended to maximize the effects of technology transfer, etc., rather than deciding which tool to use based on the assumption of ICT tools, it is important to first conduct full review of the form of training (classroom, practical training, inspection, etc.) and the optimum learning method (composition of teaching materials, method of teaching, etc.) from the viewpoint of instructional design, and then to select the tools that best fit the purpose. (See section 5.2 for details).
	Out of ICT tools, online meeting tools, chat tools and so on are already in wide general use so the technical hurdles for users are minor. Therefore, such tools should be aggressively utilized, provided that such use is appropriate in light of the objectives of the training.
There are tools that are considered to present rather high technical obstacles to users (VR/AR, LMS, monitoring of practical training using videos, etc.)	On the other hand, tools that are expected to present somewhat high hurdles for users include VR/AR, LMS, video monitoring of sites, etc. Such tools should be utilized if it is judged that the training outputs are worth the effort involved in preparing them on the implementing side and the time it takes the trainees to learn how to use them and so on. Moreover, from the responses to questionnaires, concerning VR/AR that is anticipated as effective for hands-on training that is hard to implement remotely, it is felt that use in remote training is not feasible except in a few limited cases. (See Chapter 5 for details)

3.1.2 Training Program for Nikkei Communities

In the questionnaire survey targeting the Training Program for Nikkei Communities, responses were received from 9 JICA persons in charge involved in 40 Projects/ Activities (including email responses from 1 person involved in 2 Projects/ Activities), and 6 persons in proposing organizations involved in 5 Projects/ Activities. Hearing was also conducted with the person in charge of the Training Program for Nikkei Communities in JICA Yokohama.

(1) Remote implementation plan for FY2021

On asking about plans for the remote implementation of training in FY2021, as is shown in the following figure, no response was received in a majority of cases, however, 27 Projects/ Activities (25%) indicated that they would implement remote training and seminars.

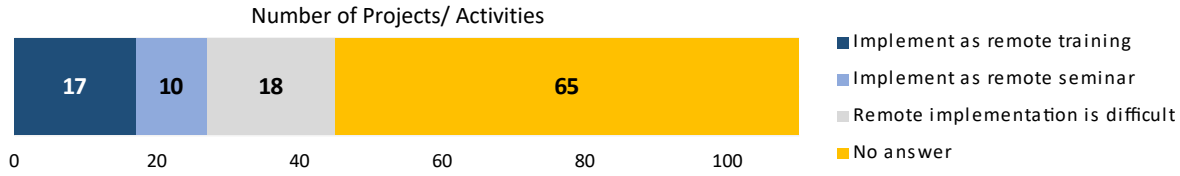


Figure-19 FY2021 Plan for Remote Implementation of the Training Program for Nikkei Communities

Out of the above, on asking about the scheduled implementation timing of the 17 Projects/ Activities for which it is planned to remotely implement training (excluding seminars), as is shown in the following figure, 3 Projects/ Activities (18%) answered that they plan to implement between August-October 2021 as envisaged in the Demonstration Survey (PoC) (or can implement at any time).

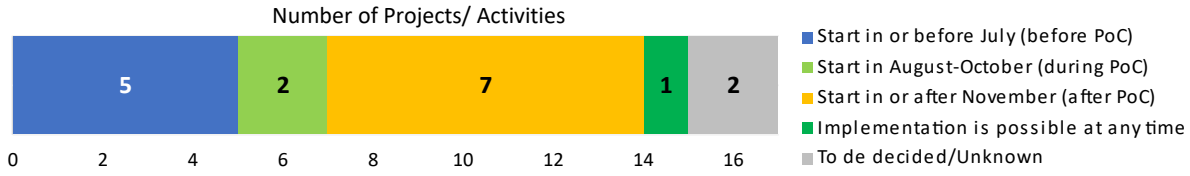


Figure-20 FY2021 Schedule for Remote Implementation of the Training Program for Nikkei Communities

(2) Tools that stakeholders want to use in remote implementation

On asking about the tools that stakeholders want to use when implementing remote training, as is shown in Figure-21, the following results were obtained (integrating responses from JICA persons in charge and proposing organizations) The results are remarkably similar to those obtained for the Knowledge Co-Creation Program (KCCP) (Country Focus). Use of online meeting tools was cited most frequently, and there was also a lot of use of file sharing tools, chat tools, and online learning based on LMS. A major difference with the Knowledge Co-Creation Program (KCCP) (Country

Focus) was that a lot of the Projects/ Activities responded that they don't use webinars and simulated experiences based on VR because there are no situations of use.

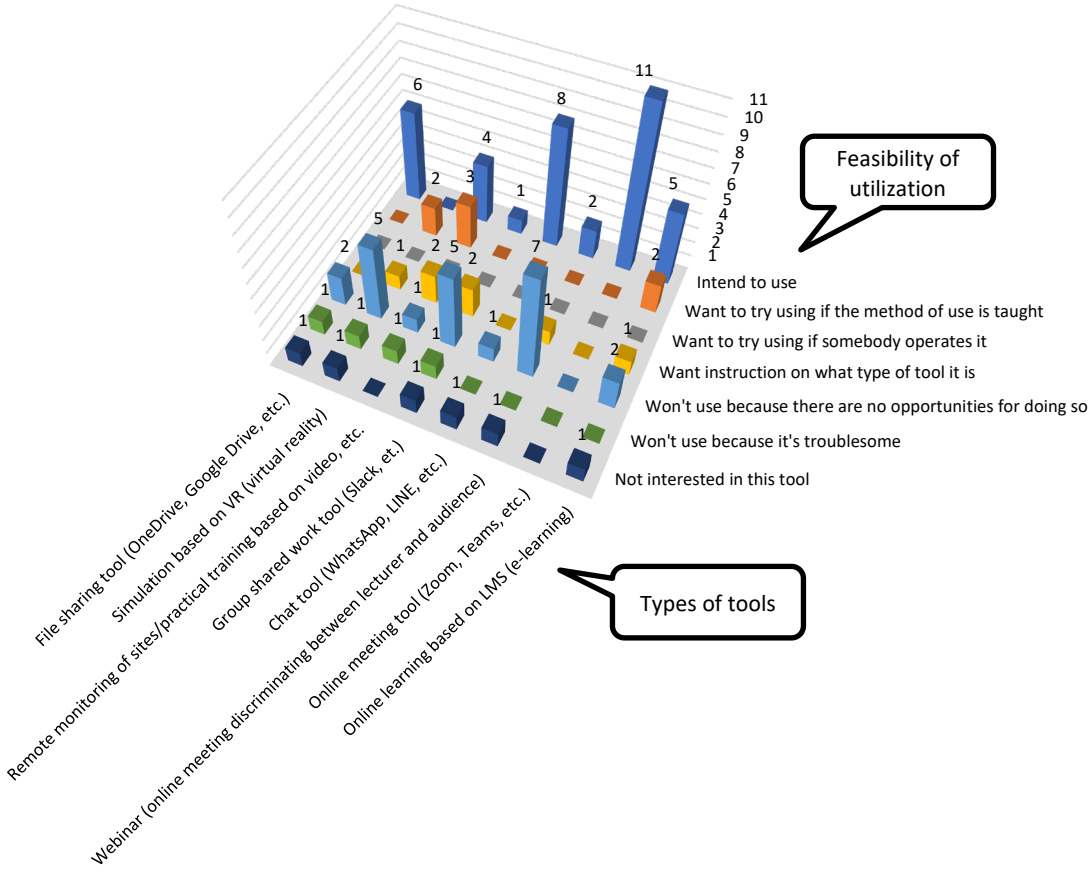


Figure-21 Promising Tools for Remote Implementation of the Training Program for Nikkei Communities

(3) Issues and Countermeasures concerning Remote Implementation Utilizing ICT of the Training Program for Nikkei Communities

From the above survey findings, the issues and countermeasures concerning remote implementation utilizing ICT of the Training Program for Nikkei Communities display almost the same trend as for the Knowledge Co-Creation Program (KCCP) (Country Focus). In addition, the following unique issues and countermeasures are applicable.

Table-8 Unique Issues and Countermeasures concerning Remote Implementation of the Training Program for Nikkei Communities

Issues	Analysis and countermeasures
Compared to the Knowledge Co-Creation Program (KCCP) (Country Focus), not many of the contents are technically sophisticated, and many contents are intended to form a network with Japan.	There is little need for VR and other sophisticated ICT equipment. Moreover, because participants place high value on travelling to Japan, many of the trainees are not interested in remote implementation. In such cases, utilization of real-time online meeting tools, etc., which are effective for building networks that are close to face-to-face interactions is thought to be effective, while it is also important to combine this with training in Japan whenever possible.

3.2 Proposal and Verification of Utilization of LMS and DX Technology for Effective and Efficient Third Country Training Program (TCTP) Implementation (Study Item 2)

Questionnaire surveys were implemented on the Third Country Training Program (TCTP) in the target areas, and responses were obtained from 28 Projects/ Activities. The respondents comprised 19 JICA persons in charge involved in 24 Projects/ Activities (including email responses from 3 persons involved in 4 Projects/ Activities) and 10 persons from implementation agencies involved in 8 Projects/ Activities.

(1) Remote implementation plan for FY2021

On asking about the remote implementation of training in FY2021, as is shown in the following figure, it was found that remote implementation is planned in almost all Projects/ Activities.

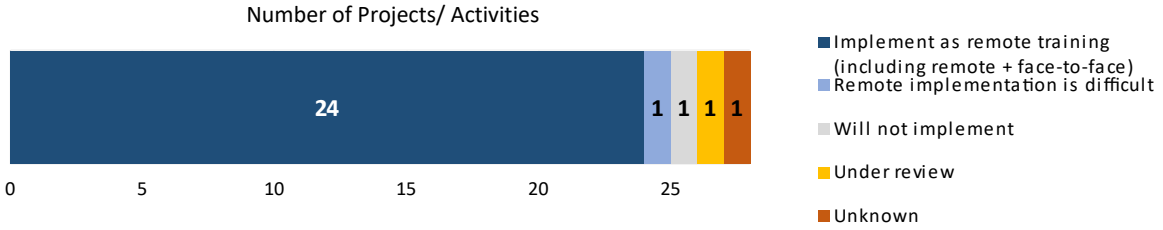


Figure-22 FY2021 Plan for Remote Implementation of the Third Country Training Program (TCTP)

Out of the 24 Projects/ Activities that responded have plans for remote implementation, 5 Projects/ Activities (21%) answered that they plan to implement between August-October 2021 as envisaged in the Demonstration Survey (PoC) (or they can implement at any time).

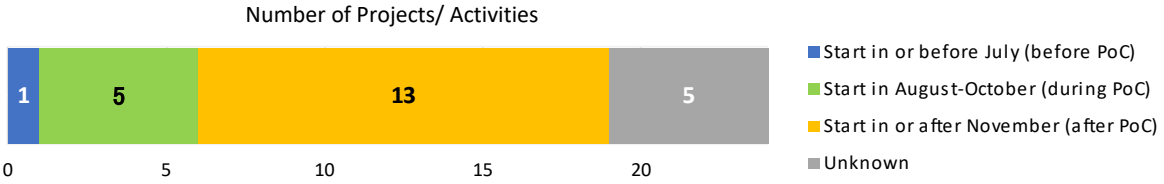


Figure-23 FY2021 Schedule for Remote Implementation of the Third Country Training Program (TCTP)

(2) Tools that want to be utilized when conducting remote implementation

On asking about the tools that want to be utilized when implementing remote training, as is shown in Figure-24, the following results were obtained (integrating the responses from the JICA persons in charge and the implementation agencies). The results are very similar to those obtained for the Knowledge Co-Creation Program (KCCP) (Country Focus) and Training Program for Nikkei Communities. Use of online meeting tools was cited most frequently, and there was also a lot of use of file sharing tools and chat tools. However, online learning based on LMS has not yet been introduced in many Projects/ Activities, although LMS was cited as the top tool that respondents would like to use if instruction about how to operate was provided. Also, the number of respondents saying they want to try using VR was about the same as the number indicating that they have no situations for its use.

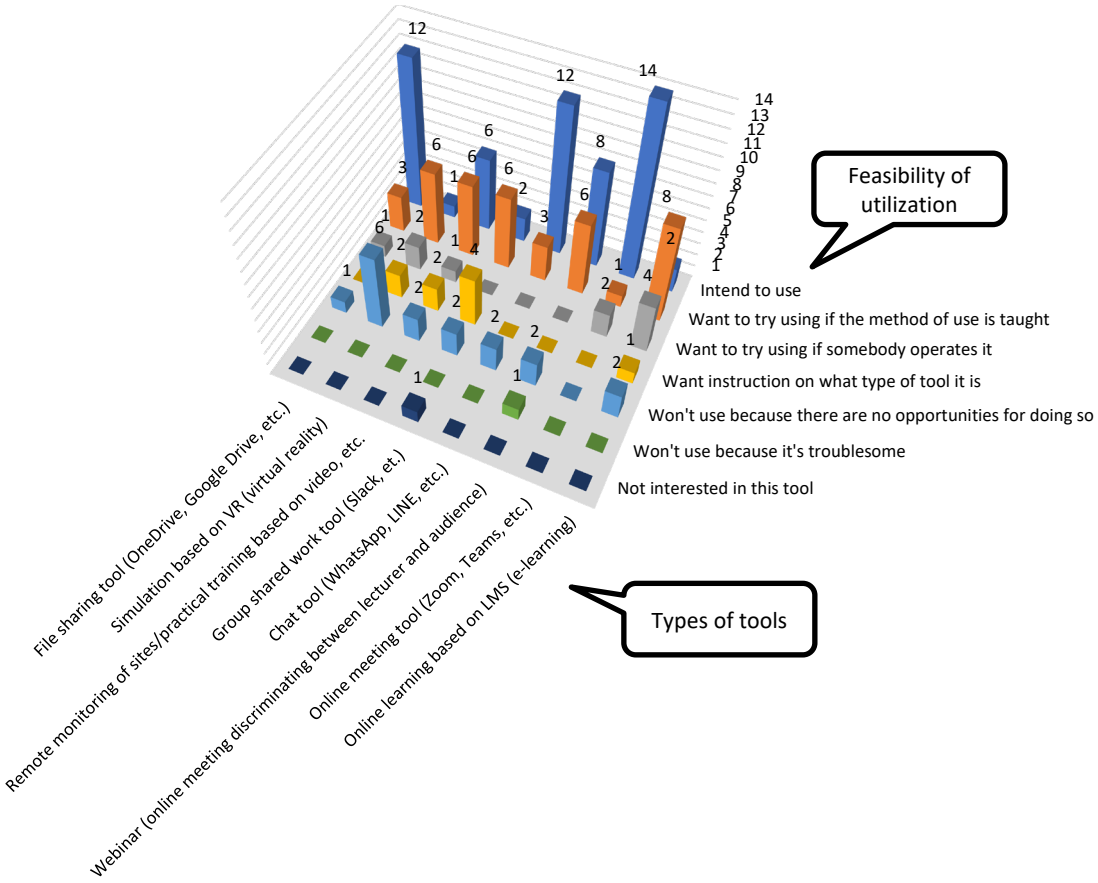


Figure-24 Promising Tools for Remote Implementation of the Third Country Training Program (TCTP)

(3) Issues and countermeasures concerning remote implementation utilizing ICT of the Third Country Training Program (TCTP)

From the above survey findings, the issues and countermeasures concerning remote implementation utilizing ICT of the Third Country Training Program (TCTP) display almost the same trend as for the Knowledge Co-Creation Program (KCCP) (Country Focus) and Training Program for Nikkei Communities, except the issues arising from time difference. In addition, the following unique issues and countermeasures are applicable concerning the Third Country Training Program (TCTP).

Table-9 Unique Issues and Countermeasures concerning Remote Implementation of the Third Country Training Program (TCTP)

Issues	Analysis and countermeasures
Compared to the Knowledge Co-Creation Program (KCCP) (Country Focus) and Training Program for Nikkei Communities, there were more people who responded that they want to actively try using ICT tools that they haven't tried before.	However, naturally, since there were also multiple comments indicating that training is required (its provision is desired) concerning the methodology and tools necessary for remote implementation, it will be necessary to train the implementation agencies on how to use new technologies related to remote implementation if such technologies are introduced.

3.3 Methods for Securing and Providing Means of Internet Communication in Remote Areas (Study Item 3)

A large-scale questionnaire survey was implemented concerning Technical Cooperation Projects/ Activities concerning which the securing of means of internet communication is an issue in the remote implementation of work in the target areas. As a result, responses were obtained from 129 Projects/ Activities, comprising responses from 32 JICA persons in charge involved in 56 Projects/ Activities (including email responses) and 28 Technical Cooperation experts involved in 24 Projects/ Activities. Moreover, hearing surveys were also implemented in respect to multiple Technical Cooperation Projects/ Activities.

(1) Situation regarding remote implementation in FY2020

Upon asking whether activities were implemented remotely in the midst of the COVID-19 pandemic, as is shown in the following figure, less than half of the Projects/ Activities indicated that they have conducted or have plans to conduct remote implementation in some form or other.

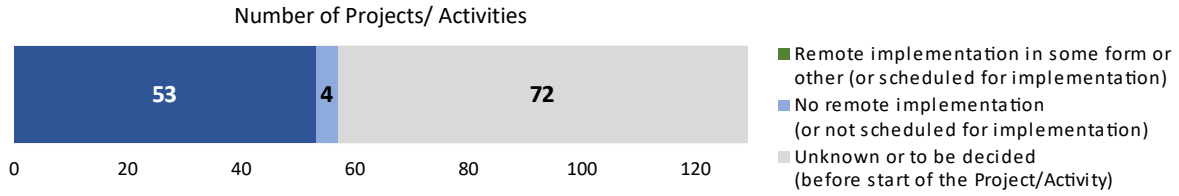


Figure-25 Situation regarding Remote Implementation of Technical Cooperation Projects/Activities

(2) Remotely implemented contents

Responses concerning the types of activities that were implemented remotely are summarized as follows.

- The most common cases are remote meetings/lectures using Zoom, Teams or other online meeting tools. The most used communication tool is WhatsApp.
- Use of LMS is limited, however, there are also Projects/ Activities that use Moodle, basic LMS (Knovio), a live streaming tool (Stream Yard), and YouTube.
- There is also use of video editing software (iMovie, etc.) for producing training videos, and Amazon Polly (text audio conversion service using deep learning technology) too.

(3) Reasons why remote implementation is not possible

On asking the reasons why activities were not implemented remotely in Projects/ Activities, the following answers were given.

- Major issues are the speed and stability of internet lines (out of 28 responses by experts, 12 Projects/ Activities)

- There are numerous activities that are not feasible unless they are taught onsite in workshops, etc.
- Government regulations and controls on behavior, etc.
- Credit card settlement for procuring apps used in training , etc. (Use of credit cards is limited in public fund accounts, so experts are currently having to use their own personal credit cards to make payments in advance).

(4) Requests for Demonstration Survey (PoC) proposals as envisaged by the Study Team

On requesting which Demonstration Survey (PoC)out of the proposals as envisaged by the Study Team is desired, the following results were obtained.

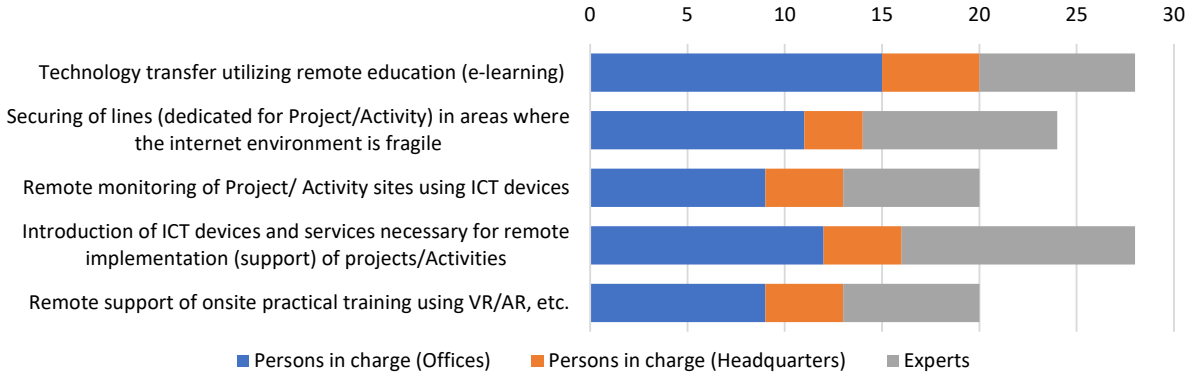


Figure-26 Needs for Demonstration Survey (PoC) in Technical Cooperation Projects/Activities

From the results of the questionnaires, the most common requests were for “Remote education” and “Introduction of ICT devices and services”, and there were numerous Projects/ Activities in which the equipment and lines necessary for remote implementation were requested. Also, there were numerous requests for remote monitoring. Other opinions and requests that were individually raised are summarized as follows.

- Establishment of a dedicated help desk for Latin America and the Caribbean
- Establishment of a questionnaire and diagnosis method for diagnosing ICT and DX capacity and utilization conditions
- Utilization of agencies that have virtual training capacity and listing of companies that specialize in virtual seminars, etc.
- Securing of a common Webinar (with simultaneous interpreting and presentation/ audience switching function) license
- Introduction of AI bots for communications that are likely to fit into the envisaged Q&A
- Sorting and proposal of methods for conducting remote implementation under US sanctions by experts.

(5) Issues and countermeasures concerning methods for securing and providing means of internet communication in remote areas

From the results of this large-scale questionnaire survey too, since responses about problems regarding the speed and stability of internet lines far outnumbered other responses, the securing of internet lines is an extremely large issue when considering remote implementation of Technical Cooperation and training. However, since the internet is social infrastructure, JICA should not directly provide assistance. Accordingly, the measures that JICA can realistically take are not the provision of internet lines, but rather examination of technical steps that can contribute towards realizing the outputs of Projects/ Activities even in areas where the internet is unstable. Specific such steps include extending lines to specific Project/ Activity sites (dedicated Point-to-Point connections), application of text-based communications (SMS or chat) that can be conducted even on very low (low bandwidth) internet lines, LPWA sensor networks, etc.

3.4 Proposal and Verification of Monitoring and Efficient Communication Methods and Systems on Project/Activity Sites (Study Item 4)

In ODA Loan/ODA Grant Projects, conventionally, the employees and national staff members of JICA Overseas Offices periodically went out into the field to monitor the progress of works, etc. and confirm that things were progressing as stated in the reports submitted by the local implementation agencies. However, in the midst of the COVID-19 pandemic, since staff could not travel to sites and monitoring was left unattended for long periods in some cases, monitoring was regarded as a high-priority issue. Accordingly, hearings and questionnaire survey were conducted with implementation agencies to verify the feasibility of implementing Demonstration Survey (PoC) for the purpose of proposing and verifying realistic and practical tools for remote monitoring.

(1) Conditions of Project/Activity sites and internet lines

When considering remote monitoring on Project/ Activity sites, since the key points are access to the sites and the existence and quality of internet lines, the questionnaire asked about these matters in detail. First, concerning access to the sites, as is shown in Table-10, since all 3 Projects/ Activities cover an extremely wide area and it is not easy for staff to travel to sites for monitoring, it was deemed that remote monitoring is suitable in all 3 cases.

Table-10 Positions and Scope of Project/Activity Sites

Name of Project/ Activity (Abbreviated)	Location of Project/ Activity Site	Scope of the Project/ Activity Site
① Belem trunk bus system	City outskirts	10.8km along a highway
② Environmental Improvement Project in the Basin Lake Billings	City outskirts	4,158.50 ha
③ Coastal Sanitation Improvement Project in Santa Catarina State	City built-up area	5 cities in the state

Concerning the quality of internet lines on Project/ Activity sites, as is shown in Table-11, the site offices in all Projects/ Activities have relatively fast lines. Except in the case of the Belem project in ① and the Santa Catarina project in ③, the uploading speed when sending data from sites, although not fast, is sufficient for remotely conducting the monitoring Demonstration Survey (PoC).

Table-11 Internet Line Conditions in Project/Activity Sites

Name of Project/ Activity (Abbreviated)	Line of Site Office				Outdoor line
	Type	DL	LT	UL	
① Belem trunk bus system	Optic fiber	14 Mbps	3 ms	840 Mbps	4G/3G
② Environmental Improvement Project in the Basin Lake Billings	ADSL line	45 Mbps	16 ms	11 Mbps	4G
③ Coastal Sanitation Improvement Project in Santa Catarina State	Optic fiber	18 Mbps	16 ms	3 Mbps	4G

* DL = download, LT = latency, UL = upload

The offices in all these Projects/ Activities are served by relatively high-speed internet lines. The speed of sending data from the site in the "upload" direction is fast except for the case of ① Belem. Except at the office in ③ Santa Catarina, internet speeds are considered sufficient for remotely implementing the monitoring demonstration experiment described later.

(2) Needs for Demonstration Survey (PoC)

Next, on presenting the Demonstration Survey (PoC)plans envisaged by the Study Team and asking which plans the Project/ Activity sites want to try implementing (multiple answers), as is shown in Table-12, no request was forthcoming from the Belem project in ①. The required quality (bandwidth) of internet lines is higher as the Demonstration Survey (PoC) proposals move to the left in the table.

Table-12 Demonstration Surveys (PoC)that Project/Activity Sites Want to Try Implementing

Name of Project/ Activity (Abbreviated)	Remote monitoring using a drone	Site remote monitoring using wearable camera	Site remote monitoring using fixed cameras, sensors, etc. on site
① Belem trunk bus system			
② Environmental Improvement Project in the Basin Lake Billings	✓	✓	✓
③ Coastal Sanitation Improvement Project in Santa Catarina State	✓		✓

(3) Issues and countermeasures concerning monitoring of Project/ Activity sites

In the monitoring of Project/ Activity sites, in many cases it is necessary to have interactive monitoring based on video images rather than still images, however, in order to transmit videos that meet such required quality (picture quality) from JICA site offices in real-time, it is necessary to have extremely large uploading bandwidth (from sites). To achieve effective remote monitoring over limited bandwidths that do not meet such required standards, it is deemed necessary to take steps such as, for example, prioritizing the fineness (resolution) of images and reducing the video frame rate and so on.

3.5 Improvement of IT Literacy of Staff in JICA Overseas Offices

From the findings of the first questionnaire implemented for JICA Overseas Offices, it was found that the national staff of JICA Overseas Offices often lack the literacy to implement work utilizing ICT, and concerning telework from home in particular, it was numerously reported that differences in work efficiency and other issues arise from disparities in literacy between staff members. Accordingly, since numerous requests were made for resolving IT literacy disparities and building the capacity of national staff, these were addressed by proposing a new Demonstration Survey (PoC) in addition to the 4 abovementioned survey items.

(1) Estimation of necessary IT literacy skills in JICA Overseas Offices

The Study Team examined the contents of IT literacy deemed necessary in JICA Overseas Offices from the survey findings, investigated the trend of standardization of IT literacy in the world, and surveyed the contents of the "IT Passport Examination" that is implemented as an IT literacy standard by the Information-technology Promotion Agency (IPA) in Japan, and the ICDL (International Certification of Digital Literacy)[6], which is an IT literacy standard qualification adopted widely throughout the world. The Study Team originally thought that, since the ICDL is widely utilized in not only JICA Overseas Offices but also current office work in general, it would be a good idea to conduct training based on the ICDL and have staff sit the ICDL certification examinations that are implemented by private sector operators in each country. However, since later surveys revealed that not all countries in Latin America and the Caribbean have operators that provide ICDL examinations, it was concluded that it would be difficult to introduce it to all countries. As an alternative, a simple questionnaire survey was implemented to find out about what kinds of IT knowledge and skills are actually required on sites and, based on the findings, the policy was changed to estimating the IT literacy skill standards that are required in JICA Overseas Offices.

(2) Results of questionnaire survey concerning IT literacy skills in JICA Overseas Offices

The results of the questionnaire survey concerning improvement of IT literacy skills among JICA Overseas Offices staff are as shown below. First, as a major direction, given a choice out of IT literacy training contents suited to beginners or contents suited to business users in the Demonstration Survey (PoC), most respondents said that they preferred the latter.

Figure-27 Desired Direction of IT Literacy Training Contents

[6] https://icdl.org/

Next, on asking what kind of contents are preferred in the Demonstration Survey (PoC) (multiple answers allowed), as is shown in the following figure, there were numerous responses expressing a desire for basic knowledge such as the “IT latest trends introductory course” and “LMS introductory course”.

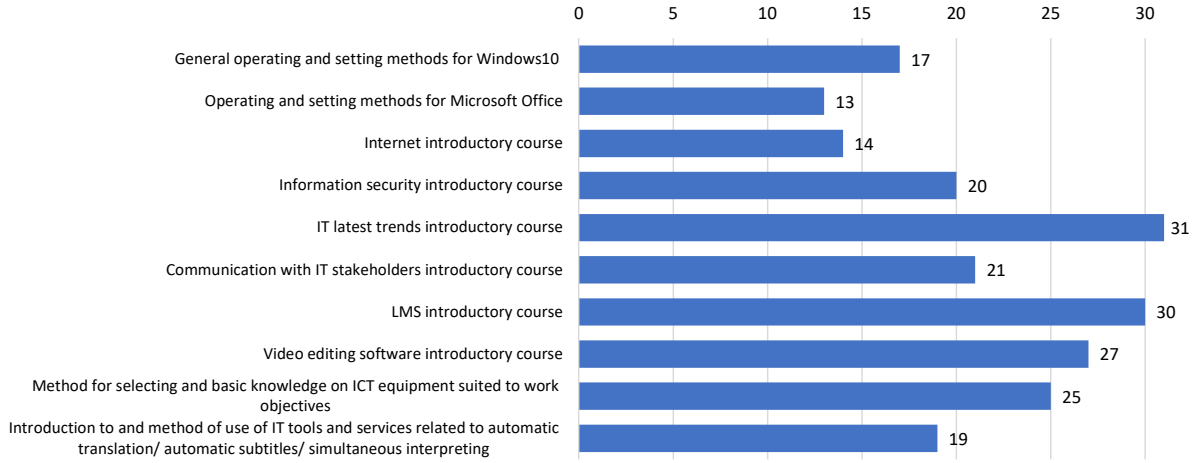


Figure-28 Needs for IT Literacy Training Contents

Out of the above answers, concerning “General operating and setting methods for Windows10” and the next “Operating and setting methods for Microsoft Office”, more detailed questions were asked, however, as can be gathered from the above, since stated desires for contents are low, the responses are shown only in outline form below.

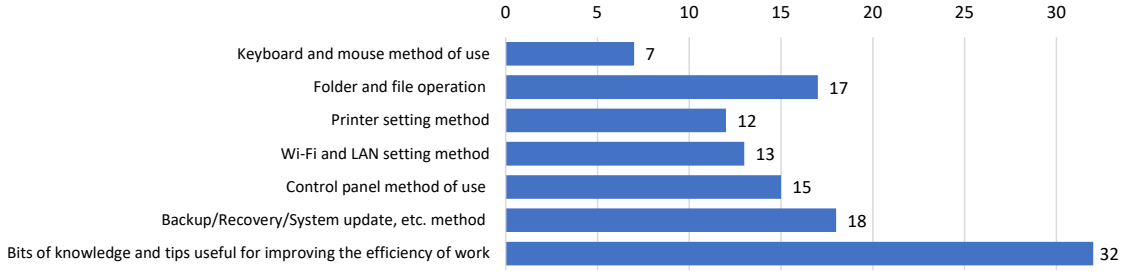


Figure-29 Desired Items in Training Contents concerning Windows 10 Operation and Configuration Methods

A feature of the responses given here is that there are extremely many wishes expressed for bits of knowledge and tips that are useful for improving the efficiency of work. Moreover, in response to detailed questioning Microsoft Office, most responses expressed a desire for training in Excel (21 responses), followed next by PowerPoint (17 responses) and finally Word (13 responses).

(3) Issues and countermeasures concerning improvement of IT literacy in JICA Overseas Offices

From the results of the above questionnaire survey, concerning the improvement of IT literacy in JICA Overseas Offices, rather than aiming to rectify literacy disparities as initially envisaged by the Study Team (setting the minimum required literacy skill level, certainly clearing the said level, and thereby reducing disparities in teleworking work efficiency due to IT literacy differences between staff), there were found to be more requests for utilization of IT to improve work efficiency (training geared to imparting specific knowledge and tips useful for improving the efficiency of work). Accordingly, it is likely that training contents will be compiled in line with this approach in the Demonstration Survey (PoC), however, in this case too, the setting of a skill standard and training geared to rectifying literacy disparities among national staff should be separately established apart from the Demonstration Survey (PoC).

4. Implementation of Demonstration Surveys (PoC)

4.1 Overall Outline of Demonstration Surveys (PoC)

In this Study, it was intended for Demonstration Surveys (PoC) to be implemented on 3 or 4 Projects/Activities. Originally, at the time of Progress Report 1, the Study Team proposed the following 9 Demonstration Survey (PoC) plans, however, upon conducting further investigation, 3 or 4 cases were finally selected for Demonstration Survey (PoC).

Table-13 Relationship between Original Demonstration Survey (PoC) Plans and Targeted Issues and Needs

Plan	Name of Demonstration Survey (PoC) plan	Issues/needs that to be resolved	Remarks
1	Utilization of LMS in Third Country Training Program (TCTP), Knowledge Co-Creation Program (KCCP) (Country Focus), and Training Program for Nikkei Communities, etc.	Various issues when implementing remote training (time difference, communication, etc.)	
2	Construction of the ICT environment in C/P agencies where implementation of remote training is difficult	Shortages of equipment and environment when implementing remote training	
3	DX for realizing more efficient management of training	Increasing complexity of work when implementing remote training	Original initiatives (DX)
4	Demonstration of remote activity implementation methods in areas that have a fragile internet environment	Inadequate internet environment for implementing remote training	
5	System for supporting measures to prevent the spread of COVID-19 on ODA Loan/ODA Grant sites	(COVID-19 countermeasures)	Original initiatives (DX)
6	Monitoring of Project/ Activity sites based on video communications	Remote monitoring of Project/ Activity sites	
7	Site monitoring based on use of local 5G and drones	Remote monitoring of Project/ Activity sites	Original initiatives (DX)
8	Standardization of IT assessment for national staff in JICA Overseas Offices	Shortage of ICT skills among NS	
9	Creation of guidelines for implementing remote training using LMS	Support for agencies implementing remote training using LMS	

Upon conducting additional questionnaire surveys and hearing surveys, etc. with JICA task teams and advancing examination of the Demonstration Survey (PoC) plans to be actually implemented, as is described in Chapter 3, it was eventually decided to implement the following 4 Demonstration Surveys (PoC).

Table-14 Finally Implemented Demonstration Survey (PoC) Plans

Plan	Original Demonstration Survey (PoC) plan	Finally implemented Demonstration Survey (PoC)
1	Utilization of LMS in Third Country Training Program (TCTP), Knowledge Co-Creation Program (KCCP) (Country Focus), and Training Program for Nikkei Communities, etc.	Demonstration Survey (PoC) 1: Utilization of LMS and Creation of Guidelines in the Knowledge Co-Creation Program (KCCP) (Country Focus), Training Program for Nikkei Communities, and Third Country Training Program (TCTP) (integration of original plans 1 and 9)
2	Construction of the ICT environment in C/P agencies where implementation of remote training is difficult	Do not implement → Only propose (see Chapter 5)
3	DX for realizing more efficient management of training	Do not implement → Only propose (see Chapter 5)
4	Demonstration of remote activity implementation methods in areas that have a fragile internet environment	Demonstration Survey (PoC) 2: Data Acquisition and Analysis using Smartphone Apps that Can be Used even in Areas that have a Fragile Internet Environment
5	System for supporting measures to prevent the spread of COVID-19 on ODA Loan/ODA Grant sites	Do not implement
6	Monitoring of Project/ Activity sites based on video communications	Demonstration Survey (PoC) 3: Site monitoring in ODA Grant and ODA Loan Projects
7	Site monitoring based on use of local 5G and drones	
8	Standardization of IT assessment for national staff in JICA Overseas Offices	Demonstration Survey (PoC) 4: Improvement of IT Literacy of Staff in JICA Overseas Offices
9	Creation of guidelines for implementing remote training using LMS	(Integrate with plan 1)

The following sections describe the 4 Demonstration Surveys (PoC) that were implemented.

4.2 Demonstration Survey (PoC) 1

(1) Outline and objective of the Demonstration Survey (PoC)

The Demonstration Survey (PoC) aims to implement remote training utilizing LMS in the Third Country Training Program (TCTP), Knowledge Co-Creation Program (KCCP) (Country Focus), and Training Program for Nikkei Communities, etc., but not including the Knowledge Co-Creation Program (KCCP) (Group and Region Focus). Through utilizing LMS, the objective is to implement remote training that gives maximum consideration to the features of Latin America and the Caribbean, especially its large time difference with Japan and its almost entirely homogenous linguistic environment, and to thereby obtain know-how and lessons regarding the future implementation of remote training in the region.

(2) Demonstration Survey (PoC) targets

Based on hearings concerning the training objectives, functional requirements, non-functional requirements, and training contents, selection was conducted from training excluding the Knowledge Co-Creation Program (KCCP) (Group and Region Focus) (Third Country Training Program (TCTP), Knowledge Co-Creation Program (KCCP) (Country Focus), and Training Program for Nikkei Communities), and it was deemed that the Demonstration Survey (PoC) is suited to demonstration of a LMS for managing comprehensive and dispersed learning processes. In all of the training programs, the basic training design had been completed. Moreover, rather than simple input-centered learning, the programs included group learning and methods for enhancing learning outputs through independent and discovery-based work. As a result of discussions, concerning the Training Program for Nikkei Communities, it was decided that there is not enough time to prepare training using a LMS, so this was removed as a target of the Demonstration Survey (PoC).

Target programs	Third Country Training Program (TCTP) in Chile "Development of capacities in the incorporation of the DRR approach to public investment projects"	Knowledge Co-Creation Program (KCCP) (Country Focus) training in Columbia "Education in Japan of Colombian Exerts on Productivity Management"	Education Program for Nikkei Next Generation
Training implementation agency	Ministry of Social Development and Families (MDSF) (Chile CP)	RIIM ChuSanRen, Inc. (Work contractor)	Japan Overseas Cooperative Association (JOCA) (Work contractor)
Targets	Staff in charge of public investment projects in each country in Latin America, both English speaking and Spanish speaking areas (lectures will be conducted in English, with simultaneous interpreting in the synchronous type and subtitles in the asynchronous type)	Corporate management and production management consultants They have consulting experience with local companies and are willing to learn practical methods based on theory.	Staff from 9 countries in Latin America who received training in Japan in the past Because they are working members of society, it is necessary to mitigate the workload
Training goal	Capacity building of staff in charge	Consultant capacity building	Promotion of understanding about Japanese culture among Nikkei Communities
Number of participants	25 persons	18 persons	50 persons each time, maximum 250 persons in total
Implementation period	May 5, 2022-July 28, 2022 (first year)	September 1-October 22, 2021	October 2021-January 2022
Volume of learning	7 modules comprising a mixture of synchronous and asynchronous training, total 80 hours, maximum 10 weeks per fiscal year, implementation of a final seminar in the final year	Synchronous training 2-4 times (2.5h per time) a week, for 7 weeks	Implement 4 types of synchronous, one time only training
Training structure	Lecturers: 10 persons-15 persons 3 persons in charge of developing teaching materials 1 person in charge of e-learning The LMS vendor will provide platform management service.	Lecturers: 6-7 persons (in charge of each lecture) Office managers (IT support, assistants to lecturers), training supervisors (interpreting and translation), simultaneous interpreters (resident in Colombia)	Lecturers: (Each time) Training operation managers
Continuity	Implement for 4 years continuously from this year	Training in Japan was supposed to be implemented for 3 years continuously from 2019, however, due to COVID-19, it is scheduled to implement either by visiting Japan or remote training 3 times by 2023. It is also scheduled to conduct follow-up for each training group during the Project implementation period.	It is supposed to be implemented for 5 years continuously from last year, however, it has not yet been decided whether to implement similar online training from next year.
Outline of training	2 months of totally online learning: The e-learning training will comprise asynchronous content for understanding the contents, and synchronous content for providing feedback to trainees. Forums, Q&As and case studies will be utilized.	It was supposed to comprise training in Japan with local follow-up by expert, however, due to COVID-19, it was revised to online training + follow-up (online or visit to Japan). The synchronous training comprises lectures, presentations and consultation, while the asynchronous training comprises provision of tasks and teaching materials. After the end of the training, action plans will be implemented and follow-up conducted.	1 month of training in Japan was switched to online training. In addition to synchronous training, asynchronous training involving provision of before/ after tasks and related teaching materials will be implemented in a self-contained program. Joint problem solving and group learning among the trainees is incorporated.

(3) Demonstration Survey (PoC) implementation contents and schedule

As methodology for effectively and efficiently implementing online training, in accordance with the Instructional Design theory, DX tools centered on LMS were selected, configured and registered and demonstration survey was conducted on operating activities, and based on the acquired lessons, the training analysis and design methods and LMS utilization guidelines (Appendix 2) were created.

Instructional Design is a systems engineering education design technique that focuses on a broad learning process rather than simple teaching. For example, it entails selection of teaching materials, grasping the ability of trainees, progress management, monitoring and so on. The Instructional Design procedure is as follows.

Step 1	Analysis	:	Analysis of the target work and the target trainees
Step 2	Design	:	Clarification of the learning goals, configuration of the learning contents and order of provision, sorting of the means of provision and method of evaluation
Step 3	Development	:	Configuration of the learning items, creation and testing of the teaching materials
Step 4	Provision and implementation	:	Creation and distribution of media, implementation of training
Step 5	Evaluation	:	Evaluation of the level of learning through tests, etc., survey of level of utilization, and evaluation of the degree of contribution to work performance
Step 6	Improvement	:	Improvement of contents based on the results of evaluation

In light of the time available for survey activities and the scope of activity by the Study Team, the contents of activities and work schedule were compiled for each target of survey according to the conditions of the respective target training.

[Third Country Training Program (TCTP) in Chile]

Outline

In the Third Country Training Program (TCTP) in Chile, since it was necessary to develop numerous asynchronous contents, the Demonstration Survey (PoC) targeted up to the abovementioned Step 3 development of contents in the above procedure.

In the Chile Office, as is shown in Figure-30, 3 Projects/Activities under the Third Country Training Program (TCTP), including the “Development of capacities in the incorporation of the DRR approach to public investment projects” were scheduled with training by separate

implementation organizations and general management by the JICA Chile Office and AGCID. Accordingly, since it was necessary to have DX tools that would be used by multiple organizations over the medium- to long-term (not only the MDSF), the Step 2 design work (design of LMS and teaching materials creation methods) was conducted and the tools required for the Step 3 development were selected.

The Study Team established remote periodic meetings with the training team in the MDSF (training implementation entity) and persons in charge in the JICA Chile Office with a view to gathering local information, making proposals and offering advice geared to utilization of LMS. Since travel was not possible due to COVID-19 and all the activities had to be implemented remotely, a local Japanese/Spanish interpreter was recruited and 3 remote communication tools, namely SLACK, OneDrive, and Zoom, were utilized.

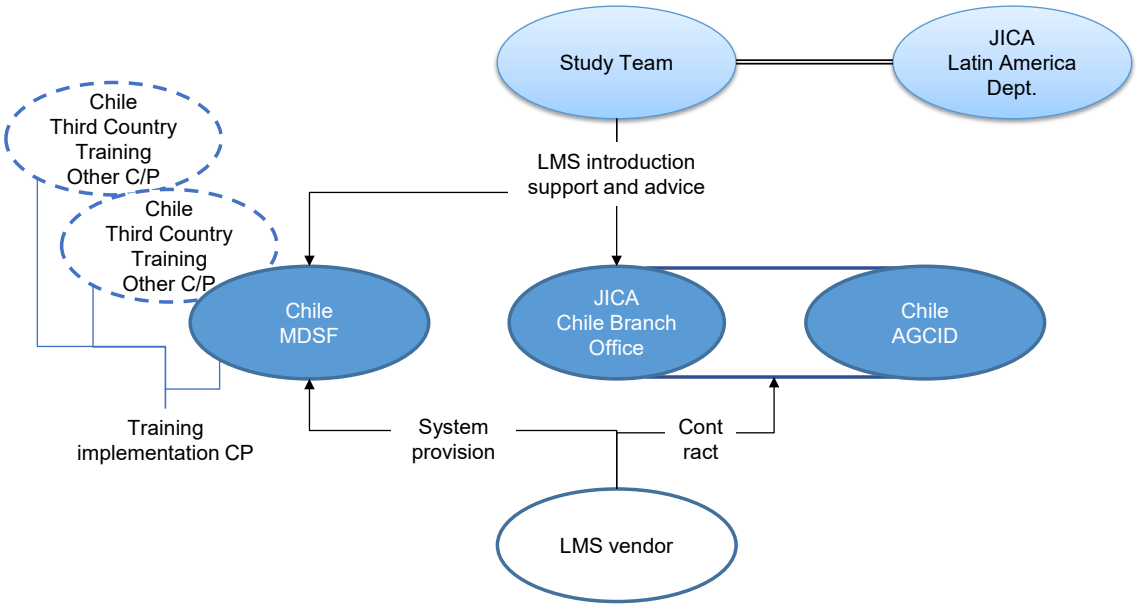


Figure-30 Implementation Structure for the Third Country Training Program (TCTP) Demonstration Survey (PoC)

The following table shows the Demonstration Survey (PoC) procedure and implementation contents.

Table-15 Demonstration Survey (PoC) 1

(Chile Third Country Training Program (TCTP)) Implementation Contents

Survey procedure	Implemented contents
1. Conduct hearing and analysis on the training conditions, curriculum, learning outputs, etc.	Weekly meetings were configured with the MDSF (CP) and JICA Chile Office, and the demonstration activities were commenced. In addition to surveying and analyzing the contents of training and organizational structure of the "Development of capacities in the incorporation of the DRR approach to public investment projects" implemented by the MDSF, survey and analysis were implemented on the overall training work that is scheduled by the JICA Chile Office.
2. Based on the results of analysis, design the teaching subjects, teaching approach and training implementation methods.	Based on the results of analysis, it was confirmed that the MDSF already conducts LMS operation through a specialized training team and that it possesses the capacity to implement education remotely. However, since other CPs that plan to implement training do not have a LMS operating structure, remote training implementation methods were examined and designed from the medium- to long-term viewpoint.
3. Based on the results of design, select the LMS and other DX tools.	Information was gathered on potentially useful LMS vendors in Chile. Information on 12 vendors and 13 products was sorted into 3 categories and eventually narrowed down to 2 LMS. After each of these vendors directly gave presentations on their products to the MDSF and JICA Chile Office, the successful LMS was decided.
4. Based on the results of design, decide the target module, design the teaching materials, and select the teaching media.	Contents creation tools that can be used in Chile were surveyed; information was sorted on the tools and media that can be used when using the adopted LMS; and following discussion Module 2 was selected as the target for demonstration development and it was decided to outsource the development of contents.
5. Develop teaching materials in the implementation agency. The Study Team supports the implementation agency in developing the teaching materials.	In addition to surveying contractors capable of producing contents in Chile, discussions were held with the MDSF to decide the specifications of contents and advance support for preparing drafts and negotiating the contract contents.
6. Train the implementation agency in how to use the LMS.	(Scheduled for implementation by the LMS provider contracted by the JICA Chile Office)
7. Implement LMS configuration and registration in the implementation agency. The Study Team supports the implementation agency in configuring and registering the LMS.	(Scheduled for implementation by the LMS provider contracted by the JICA Chile Office)

The survey procedure, schedule and results are described below. Discrepancies arose between the planned and actual contents concerning Activities 2, 3 and 4 regarding the development of teaching materials and Activities 6 and 7 regarding operation of the training. Reasons for the discrepancies are summarized in section (5) Evaluation of the Demonstration Survey (PoC).

Table-16 Demonstration Survey (PoC) 1 (Chile Third Country Training Program (TCTP))

Schedule (Plan and Performance)

	Survey Procedure	Period	Schedule (2021) 8	9	10	11	12
1.	Conduct hearing analysis on the training conditions, curriculum, learning outputs, etc.	4 weeks					
2.	Based on the results of analysis, design the teaching phenomenon, teaching strategy and training implementation methods.	4 weeks					
3.	Based on the design results, select the LMS and DX tools.	7 weeks					
4.	Based on the design results, decide on the target modules, design the teaching materials and select the teaching media.	6 weeks					
5.	Develop teaching materials in the implementation agency. The Study Team provides support to the implementation agency in developing the teaching materials.	2 months					
6.	Conduct training for the implementation agency in how to use the LMS.	3 weeks	FY22 implementation				
7.	Conduct LMS configuration and registration work in the implementation agency. The Study Team supports the implementation agency in the LMS configuration and registration work.	2 months	Outsourcing				

Plan Performance Revision

Demonstration Contents

The demonstration contents in the Chile Third Country Training Program (TCTP) are sorted according to categories①-③ in Figure-31 LMS Utilization Flow.

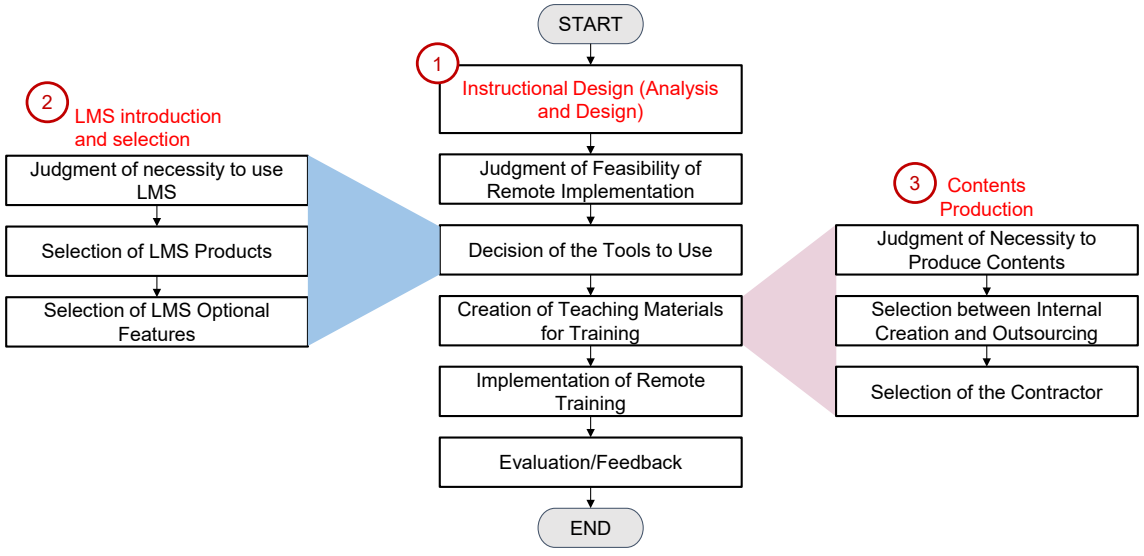


Figure-31 LMS Utilization Flow

① Instructional Design

In the JICA Chile Office and the training implementation agency (MDSF), the target work and training requirements were sorted and analyzed. Then, the following items were compiled as basic information for the subsequent processes of LMS selection, contents production, LMS configuration, and training implementation and operation.

■ Target work analysis

Z. Training work basic requirements	
1	Type and outline of the envisaged training
2	Implementation period of the envisaged training
3	Stakeholders in the envisaged training
4	Implementation period and frequency of each training (multiple fiscal years)
5	Position of the JICA Chile Office
6	Handling of training after each training is completed (management of the used teaching materials, continued development potential of the training and so on)
A. LMS basic requirements	
1	Number of trainees (by each training)
2	Number of creators of teaching materials (by each training)
3	Number of management accounts (by each training)
4	Period of use
5	Using organization
6	Number of provided courses
7	Use of options or not
8	Language of use
9	Desired start of use (each training, this fiscal year)
10	Desired start of course provision (each training, this fiscal year)
B. Preferences for LMS training	
1	Number of training participants
2	Trainee functional training
3	Manager functional training
4	Training for creators of teaching materials
5	Monitoring and analysis functional training
6	Other desired training contents
C. Envisaged operating structure	
1	Which organization will conduct overall supervision?
2	Which organization will conduct system management?
3	Which organization will conduct user management?
4	Which organization will conduct teaching materials management?
5	Which organization will conduct training operation management?

■ Target training analysis

A. Overall training	
1	Learning goals
2	Prerequisite information for the training targets
3	Envisaged changes in trainees before and after the training
B. Training program (module units and scope that can be sorted)	
1	Learning goals * By sorting from the viewpoint of "what it becomes possible to do" through receiving the training, the contents of teaching are clarified and findings can be utilized in compiling the "evaluation method".
2	Learning outputs * Through sorting what kind of learning outputs to seek in order to achieve the learning goals, this will prove useful in selecting the contents and learning activities. (Examples of sorting learning outputs) ・ Knowledge: Learning outputs that entail memorization (listing, defining, stating, etc.) ・ Understanding: Learning outputs that entail grasping meaning (distinguishing, describing, forecasting, etc.) ・ Development: Learning outputs that entail utilizing the information acquired through knowledge and understanding under new conditions (calculating, proving, associating, categorizing, etc.)

	・ Attitude: Learning outputs that amplify active or passive reactions that impact specific behaviors (sense of values, judgment criteria, etc. regarding specific things and conditions) ・ Comprehensive learning: Learning outputs that straddle multiple learning outputs and contents and need to be implemented simultaneously.
3	Learning motivation method * In reference to the Instructional Design ARCS model (ATTENTION, RELEVANCE, CONFIDENCE, SATISFACTION)
4	Envisaged learning behaviors * Sort according to passive learning, active learning, synchronous, asynchronous, etc.
5	Training resources (teaching materials, drafts, images, various tools)
6	Persons in charge of creating modules

② LMS introduction and selection

As a result of surveying program contents in the Chile Third Country Training Program (TCTP), the issues indicated in the left column of the following table were confirmed. Since these are consistent with the LMS effectiveness (right column), it was deemed appropriate to introduce a LMS.

Issues	Effective functions in LMS
Asynchronous training accounts for the majority, so it is necessary to manage the contents data.	Contents production management/ access function, etc.
The training comprises 7 modules and 56 themes for up to around 30 trainees, so it is necessary to manage the learning progress, results and usage by users according to the number of trainees and volume of learning.	Learning progress management/ results management/ user management/ trainee support, etc.
Since it is not one-off training but rather intended for continuous implementation over 3 years, it will be possible and necessary to reuse the teaching materials and improve the training through analyzing the training data.	Contents management/ results management/ learning log analysis, etc.

In the LMS selection stage, it was confirmed that the Demonstration Survey (PoC) target C/P agency (MDSF) already uses a LMS (Moodle) and has its own operating structure. If training is implemented by MDSF alone, the most efficient approach is to use MDSF's Moodle, however, because the JICA Chile Office, Chile International Cooperation Agency (AGCID) and 2 other Third Country Training Program (TCTP) implementation agencies cannot use the MDSF's Moodle, it was necessary to introduce a new LMS that all agencies can use. Comparative examination was conducted on 3 LMS introduction methods as shown in Figure-32. It was predicted that it would be difficult for the MDSF staff members in charge to grasp the new LMS and that this would make the development time longer, however, it was decided to adopt Plan 2 in consideration of the 2 subsequent training programs.

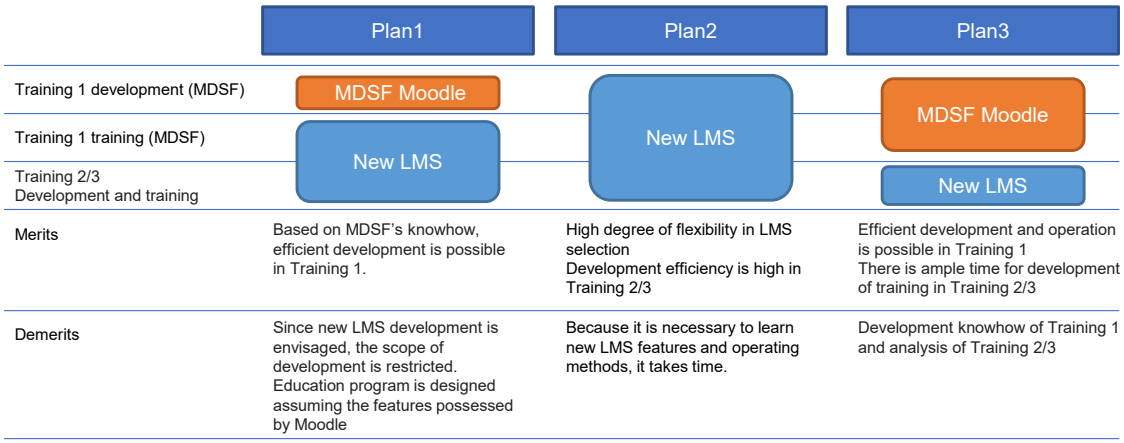


Figure-32 Comparison of LMS Introduction Plans for the Chile Third Country Training Program

i. LMS product selection: Comparative survey

As LMS products with the potential for utilization, survey was implemented on 12 vendors and 13 products including JICA-VAN. These options were divided into the following 3 categories. (The LMS products survey table is shown in the appendix).

Table-17 LMS Products Comparison Table

	Moodle	HRD LMS	JICA-VAN
LMS	Moodle、OPENLMS、Totara	FIT、BOOST、NetDimentions	CornerStoneOndemand
System Operation	on-premise（Moodle） cloud（Other）	cloud	cloud
Cost	High	Low-Middle	Low
Difficulty of introduction	Middle	Low	High
Difficulty of Operation	Middle	Low	High
Difficulty of Developments	Middle	Low	High
Functionality	Middle	High	Low (There are variety of function but it is impossible for immediate use)
Future scalability of functions	Middle	High	Low
degree of freedom	High	High	Low
Supports	Middle-High	Middle-High	Low
Security	Middle	Middle	High
Video Streaming	Other	Included	Included
Webinar	Other	Included	Other

Category 1 (Moodle) : Moodle-based LMS mainly suited to education in schools, etc.
Category 2 (HRD LMS) : LMS mainly suited to human resources development in companies
Category 3 (JICA-VAN) : Cornerstone OnDemand that has been introduced in JICA

The Category 1 Moodle is basically LMS introduced on-premises, however, because it was found that the JICA Chile Office and AGCID do not have staff members who specialize in information systems, operation may be structurally difficult in the Third Country Training

Program (TCTP) targeted here. In the same category, Open LMS and Totara are provided as cloud services, however, these target training of 500 persons or more and are not appropriate for the scale of training here.

The Category 3 JICA-VAN does not provide support for Cornerstone OnDemand in Spanish; moreover, since it only went operational this year, it will be difficult to introduce in the short term this fiscal year. Moreover, although Cornerstone OnDemand has numerous features, C/P agencies will have various operating limitations due to JICA's security policy.

From the results of this examination and based on discussions between the JICA Chile Office, MDSF and AGCID, it was deemed that Category 2 is the most suitable because it enables support in Spanish without any time difference locally and it has already been well proven in Chile.

Out of Category 2, candidates were narrowed down to Fit Learning and BOOST, which satisfy the following conditions, and final comparison was conducted.

- The system can also be used for small-scale training work such as in the Third Country Training Program (TCTP).
- Manuals and support for LMS utilization are already established.
- The system satisfies the functional requirements for the training to be implemented (multilingual, multi-browser, SCORM, compatible with video contents, etc.).
- The service is charged according to the number of users, so it can be used at a reasonable price with small or large numbers.

ii. Selection of LMS products: Contract conditions

As the LMS contractor, Fit Learning Inc. was selected based on comparison of rough estimates and proposals from a number of companies based on the same conditions. Following decision of the contractor, since it was necessary to examine and discuss the scope of outsourcing including the period of use, scale of use and options, multiple hearings were conducted with the JICA Chile Office and Fit Learning Inc. and following discussions with JICA Chile Office and C/P agency, the basic conditions of the LMS contract were decided. The main conditions are as indicated below.

	Classification	Estimate items	Estimate conditions
1	Initial cost	Number of managers who will receive training	4 persons
2	Operating cost	Number of active users	100 persons
3		Period of use	FY2021: 5 months (November-March)
			FY2022: 1 year (April-March)
4	Operating options	Vimeo (video distribution)	Use/Contract with Fit Learning Inc.
5		Smart Live (webinar function)	Use
6		Online meeting tools	Zoom/ Contract with Fit Learning Inc. (for up to 200 persons)
7		Smart games (gamification)	Do not use
8		Smart videos (authoring tool)	Use
9	Consultation	Technical office	LMS operating consultation (200 hours)
10	Contents production	Learning office	Separate comparison of contractor proposals

The users were decided based on the number of trainees in each training program scheduled to be implemented this fiscal year (minimum number of users in the contract with Fit Learning Co.). As managers, 2 persons each (chief and deputy) were provisionally selected from the JICA Chile Office (owner of the LMS) and AGCID. Options were selected out of the training contents scheduled for provision, and all agreements for external services (video distribution, webinar, online meeting) for mitigating the clerical workload of the owner were also included in the LMS contract. Since it will be difficult to build the management structure in time for this fiscal year's training, it has been decided to fully consign LMS operation to Fit Learning Co.

③ Contents production

In implementing the Chile Third Country Training Program (TCTP), the following kinds of issues were confirmed and advice was offered on gathering and sorting information and conducting examination regarding the contents production methods, contents production tools and selection of the contents production contractor.

- MDSF already utilizes Moodle, however, the LMS to be newly introduced needs to carry contents with different specifications from Moodle.
- Apart from MDSF, it appears that the other training implementation agencies, JICA Chile Office, and AGCID have little knowledge about producing contents for remote training based on ICT.

Accordingly, support was implemented down to selection of the contents production method, contents production tools, and contracted contents producer.

i. Contents production methods (internal creation/outsourcing)

Regarding the production of contents for remote training by the training implementation agency, contents may be created internally or production may be outsourced. The merits and demerits of each approach are summarized below.

Table-18 Comparison of Contents Internal Creation vs. Outsourcing

	MDSF	Outsourcing(FIT or Other)
Advantage	・Low Cost ・Easy to fix or adjustable. ・Easy to communicate	・High Quality ・Easy to start ・less demanding of human recourse and skills ・Get Professional help ・Easier to manage schedule and progress.
Disadvantage	・Quality control is difficult. ・Need human resource and schedule control. ・Heavy workload to person in charge. ・Need high skills for production. ・Progress management and schedule management are be required.	・Cost could be higher than inhouse production. ・Quality depends on the contractor ・Need communication cost(time) ・not easy to fix and adjust to completed contents

Advantages in the case of internal creation are low cost, ease of fixing or adjusting, and better communication efficiency, while disadvantages are difficulty of quality control and increased workload for persons in charge. These merits and demerits are reversed in the case of outsourcing.

Also, we have sorted the characteristics of internal creation and outsourcing according to the type of contents. The target agency MDSF already has experience of contents production using Moodle, and it is considered that internal creation should suffice for contents that do not require outstanding design, quality or special technology. However, considering that a new LMS will be used in this case, it was decided to basically outsource production with a view to mitigating the workload of the MSDF persons in charge.

Table-19 Comparison of Contents Internal Creation vs. Outsourcing based on Type of Contents

	MDSF	Outsourcing(FIT or Other)	Note
PPT＋Narration Authoring	◎	◎	
Video Production	○	◎	
Animation/Infographics	○	◎	
Test	◎	◎	
Survey	◎	◎	
PDF Document	◎	◎	
Narration recording	△	◎	
Synthetic voice	○※1	◎	※1.need Synthetic voice Authoring tool and skills
Image editing	○※2	◎	※2.need Image editing tool and skills
Visual Design	△	◎	
Instructional Design	△	○※3	※3.Depends on the contractor

ii. Contents production work

Assuming the basic policy of outsourcing contents production, cost estimates were requested from 5 local companies based on Chile, and responses were obtained from 3. The outsourced contents included video contents production and Instructional Design geared to enhancing the education effect, however, only 1 contractor was capable of handling the work.

[Knowledge Co-Creation Program (KCCP) (Country Focus) Training in Columbia]

Outline

The Knowledge Co-Creation Program (KCCP) (Country Focus) training in Columbia was planned to mainly comprise synchronous training that utilized existing teaching materials (used for training in Japan in the same course in FY2019 and other courses) for the training and used JICA-VAN for operation management of the training and distribution of teaching materials to trainees. Since there was only just over 1 month before the start of the training, the teaching design was kept to limited contents and support and consultation were provided for configuring and registering training programs for management on JICA-VAN.

Concerning the implementation structure, RIIM ChuSanRen, Inc. (the contractor) planned, designed and operated the training and also handled utilization of JICA-VAN, while the Study Team supported the design and registration of JICA-VAN in the remote training by RIIM ChuSanRen, Inc. and JICA Chubu.

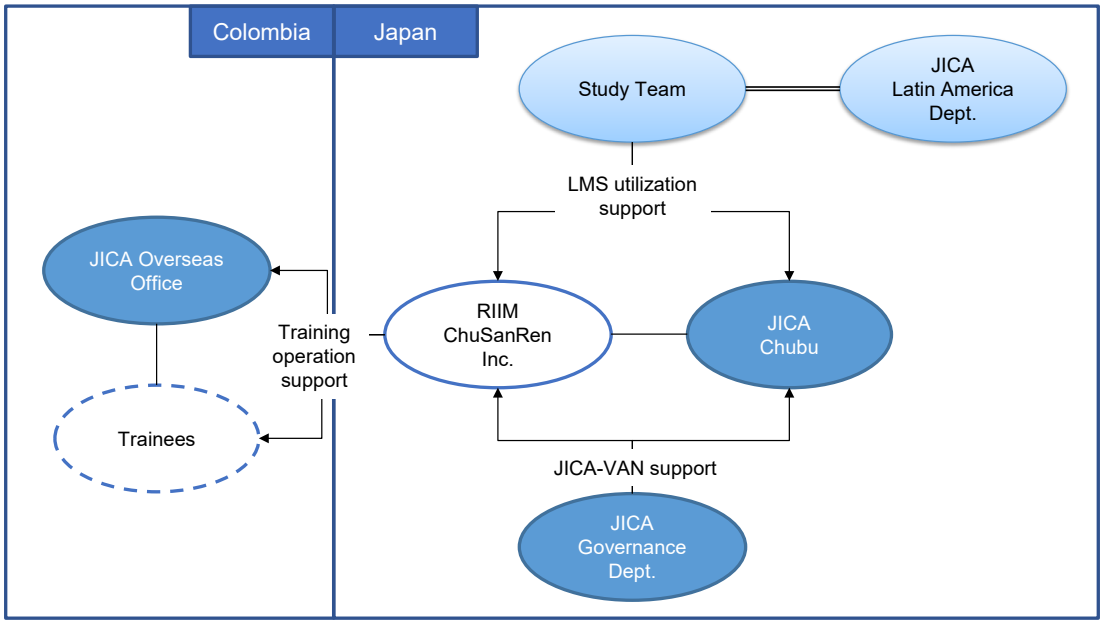


Figure-33 Knowledge Co-Creation Program (KCCP) (Country Focus) Demonstration Survey (PoC) Implementation Structure

The following table shows the Demonstration Survey (PoC) procedure and implementation contents.

Table-20 Demonstration Survey (PoC)1(Colombia Knowledge Co-Creation Program (KCCP) (Country Focus)) Implementation Contents

Survey procedure	Implemented contents
1. Conduct hearing and analysis of the training conditions, curriculum and learning outputs, and support the implementation agency in designing improvements to the teaching subjects, teaching approach and implementation methods.	Upon confirming the training program contents in advance, members of the Study Team visited JICA Chubu to discuss and decide the methods for sorting the instructional information and utilizing JICA-VAN. The scope of utilization was limited to use for curriculum functions. There was no two-way communication via the community feature and it was only used for distributing the teaching materials (text and videos).
2. Configure and register the LMS in the implementation agency. The Study Team supports the implementation agency in the LMS configuration and registration work.	Following completion of the work in 1, the JICA-VAN registration test and verification were implemented with related personnel. Based on the decided policy, the methods for configuring each function were confirmed and prepared. Concerning the overall registration work, progress was remotely checked and followed up.
3. Register the selected trainees in the LMS.	The registration work was conducted not by the contractor but by the responsible staff in JICA Chubu due to the JICA-VAN authority setting.
4. Implemented training on the LMS. The Study Team conducts technical support and monitoring.	On the first day of training implementation, members of the Study Team visited JICA Chubu to confirm utilization on the ground. Ongoing confirmation was conducted on the progress of the training utilizing JICA-VAN.

The survey procedure, schedule and actual activities were as follows.

Table-21 Demonstration Survey (PoC) 1 (Colombia Knowledge Co-Creation Program (KCCP) (Country Focus)) Schedule (Plan and Performance)

Survey Procedure		Period	Schedule (2021)				
			8	9	10	11	12
1.	Conduct hearing analysis on the training conditions, curriculum, learning outputs, etc. and support the implementation agency in designing improvement of the teaching phenomenon, teaching strategy and training implementation methods.	2 weeks					
2.	Conduct LMS configuration and registration work in the implementation agency. The Study Team supports the implementation agency in the LMS configuration and registration work.	4 weeks					
3.	Register the selected training participants in the LMS.	2 weeks					
4.	Implement training on the LMS. The Study Team conducts technical support and monitoring.	2 months					
5.	Feedback from stakeholders, evaluation and analysis.	1 months					

Plan Performance

Demonstration contents

In examining the method of LMS utilization, it is first necessary to sort instructional information concerning what kinds of teaching activities and learner behaviors comprise the target training. Instructional information refers to the lecture implementation methods (synchronous /asynchronous), learner outputs (tests, questionnaires, tasks, etc.), materials used in the training, and communication methods (questions, discussions, cooperative learning, etc.). Table-22 shows the instructional information for this training program. Concerning each program in the training, it is desirable to first list the instructional information and then make adjustments with a view to enhancing the training effects. By conducting such examination, it is possible to improve the training so that it is interactive as opposed to one-way training, which tends to occur in remote training. In particular, encouraging trainees to produce outputs and incorporating mutual learning and other two-way instructions are effective for fixing contents in the memory.

Table-22 Knowledge Co-Creation Program (KCCP) (Country Focus) Training in Columbia Instructions Table

Date		Lecture theme (provisional)	Synchronous/ Asynchronous	Video	Test	Questionnaire	Pre-training tasks	Post-training tasks	Lecture materials, related teaching materials, related URL	2-way
September 2	8:00-10:30	Orientation, consultation outline	Synchronous	No	No	No	No	No	・ Agenda (topic list) ・ Curriculum composition (Excel table)	No
September 3-		Video viewing: History of manufacturing in Japan, Outline and introduction of Kaizen and its dissemination	Asynchronous	4 videos		・ Review questioner for self-study (Word)			・ Review questioner for self-study (Word)	
September 8	8:00-10:30	Policy management	Synchronous	No		・ Post-training common questionnaire			・ PPT teaching materials ・ Secondary teaching materials Excel ・ Word drill materials	
September 9	8:00-10:30	Preliminary survey and intermediate group presentations	Synchronous	No		No			・ PPT template for presentation ・ 4 groups survey materials (Word, etc.)	
September 10	8:00-10:30	Preliminary survey intermediate group presentations	Synchronous	No		No				

After sorting the training program instructional information, examination was conducted regarding how to implement the instructions in a remote environment. Various methods are available for implementing instructions, for example, use of video meeting tools and communication tools such as mail, chat, SNS, etc. if LMS functions are not used, and use of the JICA-VAN community function, learning package function and so on.

Decision about which methods to use was made upon considering the balance between the LMS system operation management load and training operation management load. In utilizing JICA-VAN, it is necessary to understand Cornerstone's unique system concept and operating methods as well as system configuration and operation configuration (authority) in accordance with JICA operating rules, and workload arises in conducting registration and maintenance work. Utilizing the LMS makes it possible to efficiently manage remote training and opens up possibilities for utilization and development in the medium- to long-term, however, because the balance between workload and utilization effects differs greatly according to the scale and continuity of training, it is necessary to examine each case individually. In the Study here, the LMS utilization method was examined and the policy for utilizing tools was decided upon sorting the aforementioned instructional information.

Table-23 Colombia Knowledge Co-Creation Program (KCCP) (Country Focus)
– Results of Examining Methods of JICA-VAN Utilization

Synchronous lecture implementation method	■ Used tool: Zoom meetings are used. ■ Implementation policy: Zoom ROOM is the same URL for all lectures. Separately prepare the training schedule and guide to the access method for trainees, and provide information by email and in orientation. Also register and publish information on JICA-VAN.
Communication method	■ Used tool: ・ Synchronous communication (Zoom Meetings) ・ Asynchronous communication (JICA-VAN) ■ Implementation policy: ・ Do not conduct individual guidance and communication by lecturers. Only conduct synchronous communication. ・ The presentation materials submitted by trainees are uploaded to and published on JICA-VAN by the management side. Since there are only four groups, files received by email are published in the curriculum. ・ There is no 2-way communication (Q&As, discussion, etc.) between lecturers in Japan and trainees. ・ 2-way communication may arise between trainees in each group, however, this is not followed in the training but rather is left to each trainee's SNS.
Task submission method	■ Used tools: Mail/SNS (examine JICA-VAN utilization upon viewing the operating conditions) ■ Implementation policy: ・ Concerning the task submission method, have action plans submitted by November. Decide on notifying the action plan submission method by the middle of October. ・ Do not use the JICA-VAN community feature in the initial stage. Consider using the JICA-VAN community feature around November when trainees have become accustomed to the system.

Curriculum registration method	■ Used tool: JICA-VAN ■ Implementation policy: ・ The curriculum is registered on JICA-VAN, however, synchronous lectures are not registered as events and do not utilize the community feature. ・ Register the program from September 2 to October 22 as a single curriculum.

(4) Equipment and tools used in the Demonstration Survey (PoC)

JICA Headquarters introduced the LMS (Cornerstone OnDemand) for use in all JICA's Projects/Activities in April 2021 and it went into full-scale operation in October. In the Study, it was intended from the beginning to target JICA's remote training utilizing LMS as a Demonstration Survey (PoC).

In the targeted Knowledge Co-Creation Program (KCCP) (Country Focus) training in Columbia, JICA-VAN (JICA's network utilizing LMS) was adopted, while in the Third Country Training Program (TCTP) in Chile, since operating rules for cases where an agency in another country becomes the training manager have not yet been established in JICA-VAN, the target training was analyzed from the viewpoint of Instructional Design, and tools were selected based on the policy of selecting out of multiple systems also including an original LMS (Cornerstone OnDemand or other LMS). The 2 LMS systems that were final candidates are sorted as follows.

Moreover, in the Chile Third Country Training Program (TCTP), although a system was not adopted due to problems found in the structure in the demonstration, survey and examination were conducted on contents production tools and the following results were obtained.

① LMS introduction

Out of 12 companies targeted for survey, the screening was narrowed down to 2 LMS, i.e. a Spanish language LMS and a LMS developed in Chile, and it was eventually decided to adopt the Spanish language Fit Learning system.

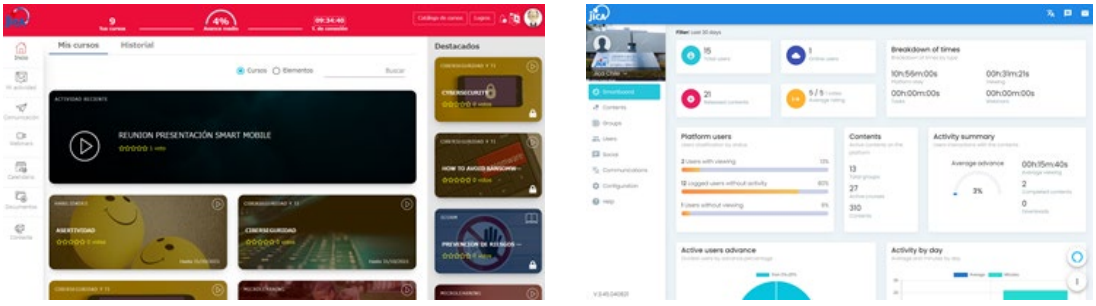


Figure-34 Fit Learning Training Screen and Manager Screen

Features of Fit Learning:

- This is provided as a cloud service and it also offers onsite support in Spanish.
- The development team is based in Spain and there is a sales office in Chile.
- It is designed with emphasis on the user experience (UX) and can be used intuitively (no need for a manual). Moreover, the screen can be freely personalized.
- The menu is structured, intuitive and easy to understand.
- It has been created with the goal of "reducing the manager's load by 70%".
- It has features such as avatars, medals and gamification for sustaining and enhancing motivation.
- It has stability and high-level security that can respond to large-scale operations.
- The latest features are automatically added through periodic updating.

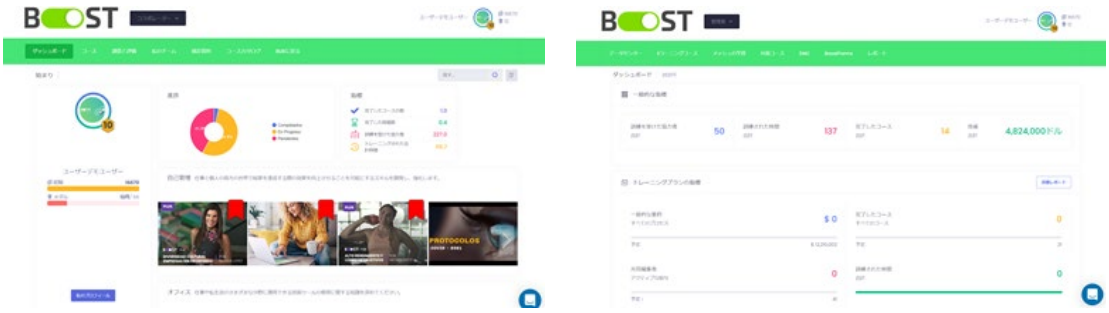


Figure-35 BOOST Training Screen and Manager Screen

Features of BOOST:

- This is provided as a cloud service and it also offers onsite support in Spanish. Contents production can also be outsourced.
- Since it was developed locally in Chile, generous support can be anticipated for local companies.
- It has a wide range of local features specific to Chile. For example, as a measure for boosting motivation, it incorporates the absolute evaluations (numerical evaluation of correct answer rates and progress, etc.) that are adopted in schools in Chile. (Trainees feel motivated when they recall their school days).
- Since Boost Co. has signed contracts with Zoom and other online meeting tools, users do not need to worry about licenses, etc.
- Since it is designed according to the unique concept of Boost Co. ,it is necessary to understand that company's system concept to operate.

- It has unique features such as a feature for reserving real classrooms, links with coffee shops, links with Government of Chile subsidies for human resources development and so on.
- Since it has a SCORM-dedicated cloud, it is only necessary to upload files to utilize them (included in the basic service).

As a result of the discussions conducted by JICA Chile Office and C/P agency considering the product descriptions and hearings with Fit Learning Co. and BOOST Co., test use in the demonstration environment, and cost estimate assuming equal conditions, it was decided to adopt Fit Learning.

The basic points in selecting the LMS for the Third Country Training Program (TCTP) in Chile are summarized below.

- The service is provided via cloud, so it can be launched and constructed in a short time.
- There is an abundant past track record, and the system stability and security can be assured.
- Operation consignments can be widely conducted, and the various requests on the side of the training implementation agency can be addressed.
- The system has various instruction features that can be utilized by staff in charge at the C/P agency conducting operation.
- Training can be provided on multiple levels for managers and persons in charge.

② Contents production tools

For the case of internally creating contents, survey was implemented on the tools that can be used in Chile.

Out of generic contents production tools that can be used in multiple LMS, concrete comparison was implemented on 2 tools that remained after screening, i.e. iSpring and Lectoria, and Articulate 360, which is utilized in MDSF.

iSpring, which operates as an add-on to PowerPoint, is used all over the world and entails the simplest operating methods. Lectoria allows richer animations to be configured than iSpring, however, it is more difficult to operate.

Articulate 360 is already used in MDSF, hence MDSF is well-versed in how to use it, although training in operation will be required for it to be used in the JICA Chile Office and AGCID. Considering the workload and time required for learning operating methods in the case of

introduction as a new tool, iSpring is recommended because staff can use it if they possess PowerPoint skills, and it is also the least costly.

Table-24 Contents Production Tools Comparison Table 1

	iSpring	Lectoria	Articulate 360
Unique point	Addon to Powerpoint	Online tool(can select server region)and on-premiss/Team Collaboration	Multiple tool package
Operation difficulty	Simple	Middle	Middle
function fulfillment	High	High	High
Synthetic voice function	Simple	Middle	Middle
Animation production	Simple	Middle	Middle
Interactive content production	High	Middle	High
Team Collaboration	Simple	Middle	High
Manual/Tutorial	Rich	Rich	Rich
update	Automatic	Automatic	Automatic
Support	Chat support(English)	Middle	Middle
Running costs	Low	Middle	Middle
Initial cost	Low	Middle	Nothing

	iSpring	Lectoria	Articulate 360
Scorm	◎	◎	◎
Spanish UI	○	○	○
Cost	iSpring Suite 770USD/año iSpring Max 970USD/año	Silver Suite$899/yr Gold Suite$1,299/yr Platinum Suite$1,599/yr	Personal Plan $999USD/ year Team Plan $1.299USD/ year

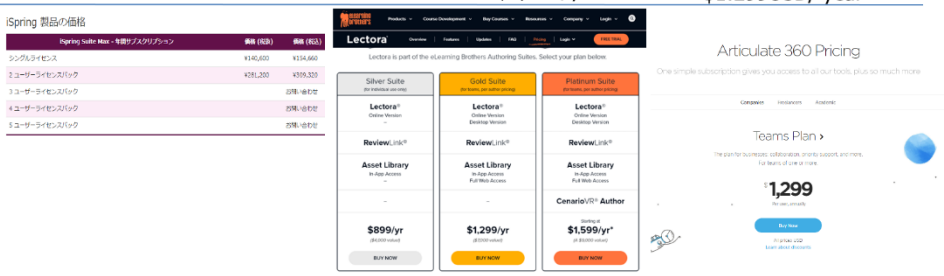


Figure-36 Contents Production Tools Comparison Table 2

(5) Evaluation of the Demonstration Survey (PoC)

① Outputs of the Demonstration Survey (PoC)

For the objective of obtaining know-how and lessons for the implementation of remote training in Latin America and the Caribbean, support was provided for conducting survey of LMS vendors/products and selecting LMS products (support for selection and utilization of DX tools) in Chile. The selected LMS products will be utilized in remote training implemented by the JICA Chile Office and AGCID from now on.

Moreover, in the Colombia Knowledge Co-Creation Program (KCCP) (Country Focus), through examining the JICA-VAN method of use according to the objective of training, it was confirmed that JICA-VAN can be effectively used through limiting its scope of use during the limited preparation period.

Moreover, the remote training introduction know-how and lessons obtained in the process of selecting LMS products and utilizing JICA-VAN was compiled into the attached guidelines.

② Issues in implementation

The following issues and problems were encountered in implementation of the Demonstration Survey (PoC).

Chile Third Country Training Program (TCTP): Issues in totally remotely managing advancement of demonstration activities

During the Study period, the Study Team members were unable to travel due to COVID-19, and activities had to be conducted amidst a time difference of 12 hours. From the beginning, a communication plan entailing SLACK, OneDrive, etc. was discussed and operated, however, numerous issues in totally remote management, for example, notification to stakeholders, access authority, tool literacy and communication loss, were confirmed. It would be more effective in a totally remote project implementation process to separate synchronous communication in Zoom meetings from asynchronous communication in SLACK, email, etc. in advance.

Chile Third Country Training Program (TCTP): Issues of additional workload based on the work implementation structure and decision of policy

As the implementation structure in the Third Country Training Program (TCTP), it is envisaged that 3 parties, i.e. the training implementation agency, JICA and AGCID, will conduct LMS management. In the Chile Third Country Training Program (TCTP), since remote implementation is being aimed for in 3 courses, i.e. the MDFS training targeted in this Demonstration Survey (PoC) and 2 other courses, and it is necessary to introduce the same LMS from the viewpoint of the training implementation management structure, rather than Moodle, which is used by the MDSF, the LMS that is most suited to the human resources capacity development field was selected. Moreover, to ensure that the MDSF can use its own LMS following completion of the Third Country Training Program (TCTP), consideration was given to selecting a LMS that is compatible with Moodle. Moreover, since the remote training in which the MDSF uses Moodle mainly comprises synchronous lectures for ministry employees, the activities placed a major load on staff because they had little experience of asynchronous training and development experience.

Chile Third Country Training Program (TCTP): Issues in detailed contract conditions following selection of the contractor and preparation of drafts in the training implementation agency

After the LMS to be used in the Third Country Training Program (TCTP) was decided, time was needed to sort the training information needed for the contract between the LMS operator and JICA Chile Office and to prepare draft contents on the C/P side, and it was decided to postpone some of the planned activities (training for personnel on the introducing side and training implementation agency in how to use the LMS product, how to operate the LMS training and so on) until next year.

Colombia Knowledge Co-Creation Program (KCCP) (Country Focus): Issues in the initial phase of JICA-VAN system introduction

- Assuming use of JICA-VAN, advance survey was conducted on Cornerstone, and it was found that specialized settings for JICA had been added to the regular system provided by Cornerstone Inc. Moreover, at the time of the Demonstration Survey (PoC), since there was no detailed manual describing many of the features installed on JICA-VAN for training managers, it was not possible to obtain sufficient information.

  Restrictions that can only be discovered in actual operation but are not visible in the user document and surface were found to exist, for example, allocation of authority to receive training can be exercised by personnel in JICA Chubu but not by personnel in RIIM ChuSanRen. It is thought that such issues can be resolved through preparing an operating manual for JICA-VAN training managers.

- In preparing an operating manual for JICA-VAN training managers, it will be effective to adopt a multifaceted approach that entails video tutorials, helpdesk, training, etc. while making improvements to each. For personnel who are not endowed with any particular LMS knowledge, it will be difficult to understand the functions of JICA-VAN by reading a detailed manual while at the same time handling regular work duties.

Chile Third Country Training Program (TCTP)/Colombia Knowledge Co-Creation Program (KCCP) (Country Focus) common: Operating structure issues considering that the LMS is a work system

The LMS is a system for managing training work; hence, to operate the system in earnest, it is necessary to have work functions (responsible staff members) such as indicated in Figure-37.

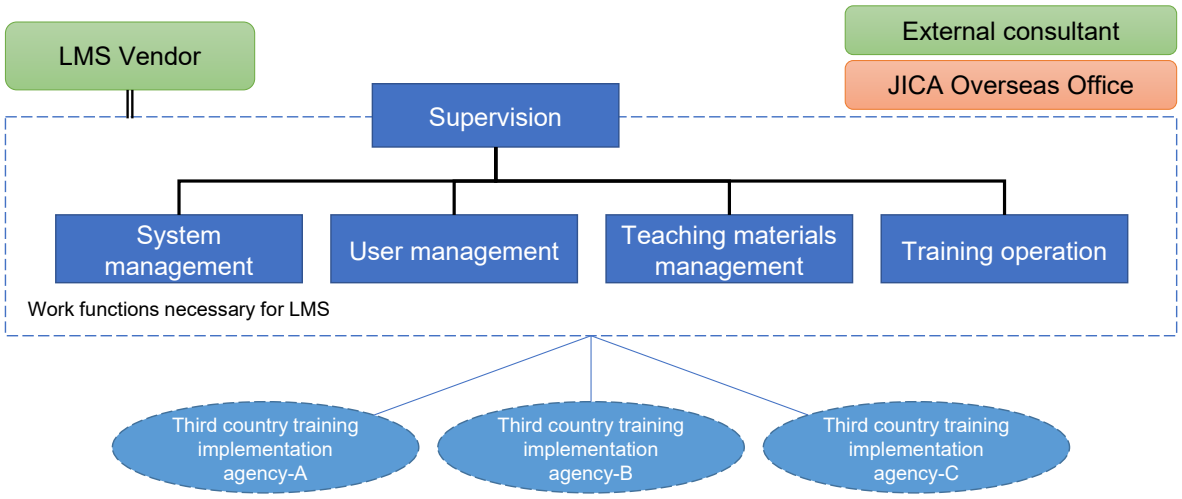


Figure-37 Structure and Roles for Operating LMS in the Third Country Training Program (TCTP)

Figure-37 shows the case of the Third Country Training Program (TCTP), however, in the operation of training based on JICA-VAN too, the same roles of system management, user management, teaching materials management, and training operation arise. Accordingly, in order to conduct remote training using a LMS, it is necessary to have staff members who are well-versed in ICT and training work. Moreover, in this Demonstration Survey (PoC), in both the Chile Third Country Training Program (TCTP) and the Colombia Knowledge Co-Creation Program (KCCP) (Country Focus), the presence of employees experienced in LMS operation in the training implementation agencies was an important factor in the success of the demonstration.

If such staff members cannot be secured, it will be necessary to utilize external consultants until employees can be trained or know-how can be accumulated within the organization.

Chile Third Country Training Program (TCTP): Issues in establishing a LMS operating structure across multiple organizations

In cases such as this, where the LMS is used for the Third Country Training Program (TCTP), the C/P agency becomes the training implementation agency and conducts the actual operation. The C/P agency's remote education experience and ICT skill levels of its staff members in charge thus become important factors in operation, so it is important to select a LMS vendor that can assign experts or provide ample support corresponding to the level of the C/P agency.

Also, in cases where there are multiple training implementation agencies in the Third Country Training Program (TCTP), the remote education experience and ICT skill levels of staff members will differ according to each training implementation agency. Oftentimes, it is not possible for a LMS used by one training implementation agency to be used by another. In

such cases, a supervisory agency (in this case, AGCID or the JICA Chile Office) needs to select and contract the system and make it available to the various training implementation agencies, but this imparts a major workload on the supervisory agency. Accordingly, important points when selecting the system concern to what degree a proxy operating service is available, and how much flexibility and variation such a service affords.

③ Cost performance of demonstration

LMS is a work management system that contains numerous useful functions when there are numerous managers in charge of system operation. However, these management functions can only work effectively when the organization concerned has an established and tried operating structure and workflow. In cases such as Chile here, where a LMS is newly selected, it is expected that between 1-6 man-months of work (depending on the scale and requirements of system operation) by IT system staff members or external experts will be required to conduct system introduction preparations starting from the analysis of work and including definition of requirements and survey of system vendors, etc. Moreover, a similar workload will be incurred in making the initial system settings, preparing the operating flow and rules and so on. However, once that the operating flow is established inside an organization, not only is it possible to limit the workload and costs of remote training but also to accumulate and utilize training knowhow and contents data. Therefore, LMS cost effectiveness increases in cases where it is used over the medium- to long-term and across multiple organizations. However, using a LMS for one-off training is unreasonable in terms of both operation and cost. In such cases, it is more realistic to outsource the training including system operation to a company that provides e-learning services. It is possible to verify the cost effectiveness of using a LMS by estimating the organization's costs from the medium- to long-term viewpoint, forecasting the frequency of training and number of trainees over the medium- to long-term, and calculating and comparing the training cost per person.

Moreover, JICA already has JICA-VAN. Since JICA-VAN is designed in consideration of medium- to long-term use over the entire organization, its cost effectiveness is likely to be highest in cases of one-off training, however, since it is still early days since its introduction, it is hoped that knowhow and an efficient operating flow will be successively established from now on. Another approach is to limit quality and workload on the side of the training implementation agency through creating an expert team to limit the method of LMS use to a certain pattern and outsource work from design to registration based on this pattern.

(6) Application to other Projects/Activities in Latin America and the Caribbean

In this Demonstration Survey (PoC), support was conducted for introducing LMS for remote training in the Third Country Training Program (TCTP) and Knowledge Co-Creation Program (KCCP) (Country Focus), however, depending on the purpose of introduction, LMS requirements, and preconditions of the implemented training and organization and so on, the optimum LMS

products and methods of utilizing LMS will naturally differ in other countries of Latin America and the Caribbean. Therefore, it is difficult to determine the optimum specifications of LMS products that can be uniformly applied to all countries and Projects/Activities.

Accordingly, the attached guidelines were compiled as a reference material from the viewpoint of sorting the requirements and conditions related to LMS introduction and indicating how to determine the basic specifications necessary for selecting LMS products based on those requirements and conditions.

① LMS introduction know-how and lessons

The know-how and lessons for LMS introduction and selection obtained through this Demonstration Survey (PoC) are described below.

- In introducing LMS, it is necessary to determine whether LMS utilization is possible upon examining and considering whether the intended training contents are suited to LMS, whether the structure for operating the LMS work system can be established, and whether the IT environment (network, etc.) is installed.
- Since the training work operating structures of each country and area in Latin America and the Caribbean are diverse and the implementation structure for the Third Country Training Program (TCTP) is complicated, it sometimes takes a long time to introduce and operate a LMS. Especially in the early introductory phase, it is important to efficiently utilize outsourcing and consultation over an appropriate scope according to the given conditions.
- When selecting LMS vendors, in addition to the features and services that are provided in the LMS, it is necessary to also understand the structure needed to operate the LMS into the future and consider whether the parts that are lacking in one's own organization can be augmented.
- LMS is a system for improving the efficiency of training work. Therefore, it is necessary to assume long-term rather than short-term operation and important to accumulate know-how while operating the system.
- The LMS is equipped with numerous features including JICA-VAN, however, rather than prioritizing the use of features, it should ultimately be treated as a tool for supporting education, and it is important in the introductory phase to start from the minimum necessary features.
- In the Third Country Training Program (TCTP) in Chile and Knowledge Co-Creation Program (KCCP) (Country Focus) training in Columbia targeted here, even though there were persons in charge who had LMS operating experience, it was not easy for them to understand and grasp the features and operating methods of a new LMS. As may be gathered from this fact, LMS systems comprise various unique specifications and concepts and are not easy to utilize.

- Since LMS operation is a new skills for many persons in charge of training, it is important to provide training in methods for operating and utilizing LMS. Adjustments such as narrowing down the training contents, assigning deputy persons in charge to prevent over-concentration of workload on one person, compiling of plans with ample preparation time and so on should be adopted according to the work contents.

② Requirements and preconditions concerning LMS introduction

The requirements and preconditions for introducing and selecting LMS are described below. When examining the introduction of LMS, it is first necessary to clarify these requirements and preconditions.

- Organization using the LMS

  Scale of the organization, complexity of the organization's hierarchical structure, presence of an IT department, IT skills for utilizing LMS, track record in LMS operation, IT skills of the training implementation agency, experience in creating teaching materials, etc.

- LMS operating structure

  Presence of persons in charge of training, feasibility of building a LMS operating structure (how far can the structure be organized for LMS supervision, system management, user management, teaching materials management, training operation and so on?)

- Training plan contents

  Period up to LMS introduction, each training period and schedule, training continuity (one time only/long-term), scale of training (number of trainees), etc.

- Features of the training to be implemented

  Is the training synchronous or asynchronous? Are there online classes? Is the language specified? Is there video distribution? Are there webinars? Types of teaching materials used, etc.

- IT- network environment

  Are there limitations on cloud use? Network conditions in the country/area concerned; is there a stable internet environment? Presence of LMS vendors; dissemination rate of PCs and smartphones, etc.

③ Know-how and lessons for creation of contents

- In remote training that mainly comprises asynchronous contents, the creation of contents entails the heaviest workload. Moreover, numerous types of digital contents and creation methods are used in remote training. For example, video contents can vary widely from simple

lecture footage to use of animation and audio sounds, etc. for the teaching materials without using lecturers, and the time and cost incurred in production differs greatly according to the type. Accordingly, when producing contents, it is important to design the optimum balance between quality, cost and delivery deadline upon clarifying the objectives (outputs) of the training.

- Creation of remote education contents can be done either by creating internally or outsourcing. In cases such as the Third Country Training Program (TCTP) where persons involved with the training operation belong to multiple organizations, it is difficult to build a structure for creating internally. Therefore, in JICA Overseas Offices, rather than improving contents production skill, it is more realistic to grasp information on contractors and development know-how for managing the outsourcing of production.
- If contents production is outsourced, since numerous tasks also arise on the consigning side, it is necessary to clearly specify the division of roles stating, “By whom?”, “What?” and “When?” in the consigned items.
- There are numerous companies that can produce digital contents, however, not many can undertake the production of education contents. If the contractor cannot conduct Instructional Design, it is necessary for the consignor to design the contents with a view to enhancing the education effect. Therefore, when selecting the contractor, it is necessary to conduct careful scrutiny based on the contractor’s track record of contents production to determine whether it has the necessary know-how to produce education contents.

4.3 Demonstration Survey (PoC) 2

(1) Outline and objective of the Demonstration Survey (PoC)

In the Project/ Activity sites located in areas that have a fragile internet environment (especially sites of Technical Cooperation Projects/ Activities), ICT equipment and tools for remotely implementing and supporting the local activities will be introduced on a trial basis and support will be given for their introduction. Moreover, cost effectiveness concerning the demonstration contents will be verified.

(2) Demonstration Survey (PoC) targets

Technical Cooperation Project "Project for Capacity Development on Integrated Management and Conservation of Biodiversity at regional level in SICA Region" (This targets El Salvador and 8 member nations of SICA)

- C/P agency: MARN[7] (Ministerio de Medio Ambiente y Recursos Naturales: Ministry of the Environment of El Salvador)

(3) Demonstration Survey (PoC) implementation contents and schedule

- Targeting ordinary citizens in areas that have a fragile internet environment (where lines are not installed or the quality of lines is extremely poor), this Demonstration Survey (PoC) had the objective of conducting dissemination and promoting awareness on preservation of biodiversity by having people report everyday sightings of species that are indicative of biodiversity.

- The target area was the village of Barrancones on the Bay of Fonseca in the east of El Salvador (where cooperation has previously been obtained from local volunteers). The local volunteers comprised a total of 10 mostly young persons who are interested in environmental preservation.

- For the reporting, no special equipment was used; rather, the volunteers were asked to download a dedicated app on their smartphones, enabling them to transmit data even when internet lines were slow, or in areas that had no internet access, to store data on the app and send it in bulk when internet connection became possible. In this way, the Demonstration Survey (PoC) intended to demonstrate that the Project/Activity could be implemented remotely.

- Concerning the species targeted for reporting, as a result of discussions between the Project/Activity expert Mr. Ohsawa and MARN, the following 3 species were selected

[7] https://marn.gob.sv/

because they can be easily identified by citizens and are numerously observed during the Demonstration Survey (PoC) period.

- ➢ American crocodile (Spanish: Cocodrilo americano, scientific name: Crocodylus acutus)
- ➢ Raccoon (Spanish: Mapache, scientific name: Procyon lotor)
- ➢ Roseate spoonbill (Spanish: Espatula rosada, scientific name: Platalea ajaja)

・ In addition to the above species, the volunteers were asked to report the dates and times of sightings*, the numbers of species and locations*, and also to send in photographs and comments (name of reporter, etc.). (Asterisks (*) denote required input items).

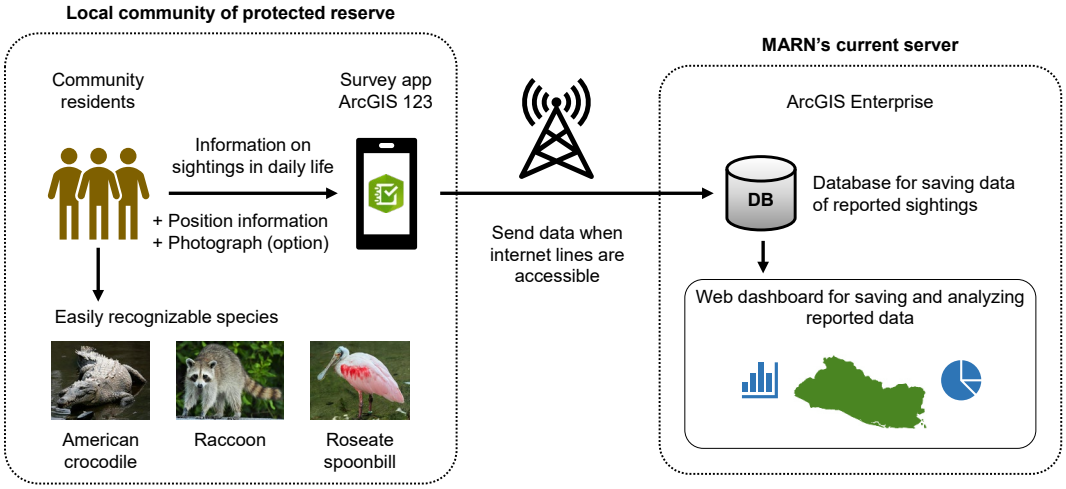


Figure-38 Conceptual Diagram of Demonstration Survey (PoC) 2

The Demonstration Survey (PoC) procedure and implementation contents are as shown in the following table. It is not indicated in this table, however, the activities described in Survey procedures 1-4 were conducted every week and those in Survey procedure 5 were conducted every other week by holding periodic online meetings so that the C/P agency, experts in the target Projects/ Activities, and Study Team could report on progress and conduct monitoring.

Table-25 Demonstration Survey (PoC)2 Implementation Contents

Survey procedure	Implemented contents
1. Reach agreement on the implementation contents with the Technical Cooperation Project/ Activity C/P agency	While receiving cooperation from the experts in the target Projects/ Activities, the implementation contents were explained to the C/P agency, and agreement for implementation was reached upon adjusting the contents.
2. Specify the ICT equipment and tools necessary for remote implementation of activities	It was originally intended for the Study Team to develop a dedicated survey tool from scratch, however, since the C/P agency was already using a similar survey tool and it was recommended that the same system be used for managing and utilizing surveyed data, it was decided to use the said tool free of charge.
3. Develop the tools to be used (smartphone app, Web dashboard)	It was originally intended to outsource development of a dashboard (cloud) for analyzing and displaying the survey forms (smartphone side) and survey results, however, because it was such a small project, no contractor could be found. Accordingly, the Study Team member in charge and IT staff members in the C/P agency jointly developed the dashboard.

Survey procedure	Implemented contents
4. Conduct training on how to use the smartphone app for residents in the target area. (Employ local contractors).	Local contractors travelled to the survey target area and implemented training for the local volunteers in how to install the survey tool, and how to download and use the survey forms.
5. Implement biodiversity observation activities on a trial basis using the introduced ICT equipment and tools. (Employ local contractors).	For 5 weeks, the local volunteers recorded sightings of the target species in their everyday lives. For 1 day a week, the local contractors traveled to the area to visit and conduct survey in various locations, and they also provided online support to the volunteers on other days.
6. Feedback from stakeholders, evaluation and analysis.	Related persons from the C/P agency and target Projects/ Activities were invited to a meeting to present the survey findings. Also, a meeting to present the results of the Demonstration Survey (PoC) was held for stakeholders. The results were evaluated and analyzed and then compiled into a written report.

Moreover, the following table indicates the procedure and actual schedule of the Demonstration Survey (PoC).

Table-26 Demonstration Survey (PoC) 2 Schedule (Plan and Performance)

Survey procedure	Period	2021			
		9	10	11	12
1. Agreement on the implementation contents with the C/P agency of the Technical Cooperation Project	2 weeks				
2. Identification of the ICT equipment and tools needed for the remote implementation of activities.	2 weeks				
3. Development of the tools for use (smartphone app and Web dashboard)	2 weeks				
4. Implementation of training for the target local citizens on how to use the tools (local subcontractor)	1 week				
5. Trial implementation of biodiversity monitoring activities using the introduced ICT equipment and tools (local subcontractor)	5 weeks				
6. Feedback from stakeholders, evaluation, and analysis	2 weeks				

PLAN Performance

(4) Equipment and tools used in the Demonstration Survey (PoC)

MARN already has ArcGIS Survey 123[8], which is a field survey product for geographic information systems, and it has so far acquired a total of more than 6,000 pieces of data in various surveys implemented mainly by rangers using this product. Since this product can automatically save data even in places that do not have internet access, and later transmit the data in bulk when a line is secured, it is compatible with the objective of this Demonstration Survey (PoC). Moreover, because the data obtained in surveys is automatically stored on the MARN server, the Study Team decided to utilize it rather than developing a new system from scratch.

[8] https://survey123.arcgis.com/

Equipment and tools used by local volunteer (reporters)

Hardware : Only the smartphones owned by the citizens

Software : ArcGIS Survey 123 (free download smartphone app)

The survey form that was developed on the ArcGIS Enterprise[9] server owned by MARN was downloaded and utilized.

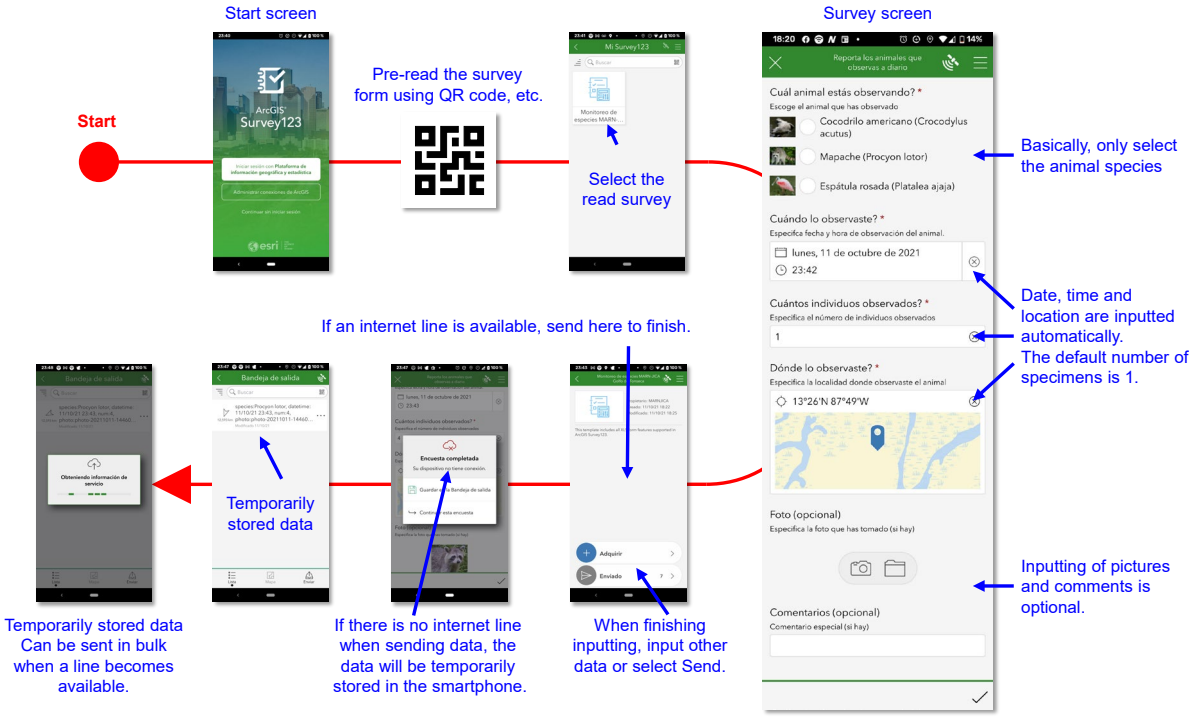


Figure-39 Developed Smartphone App for Reporting Wildlife Sightings (Survey Form on ArcGIS Survey)

Equipment and tools on the MARN side (survey implementing side)

Hardware : Server owned by MARN

Software : On the ArcGIS Enterprise owned by MARN, 2 types of dashboard were developed: 1) closed dashboard for MARN staff that shows details including the location information of report data to be viewed, and 2) publicly open dashboard that anybody including reporters can view.

It was decided not to display a map or the locations of sightings on the open dashboard. This was because, disclosing the location of sightings could cause the habitats of the target species to become common knowledge and lead to illegal poaching. Similarly, even if explicit information were not displayed, since locations could even be identified from the contents of attached photographs, the

[9] https://enterprise.arcgis.com/

photographs that were attached to report data were checked to make sure that they contained no such information.

Meanwhile, to boost the motivation of the local volunteers, the publicly disclosed dashboard indicated who made reports of sightings in time series. However, rankings of reporters were not displayed since they would have incited competition between volunteers and lead to false or inflated reporting and so on.

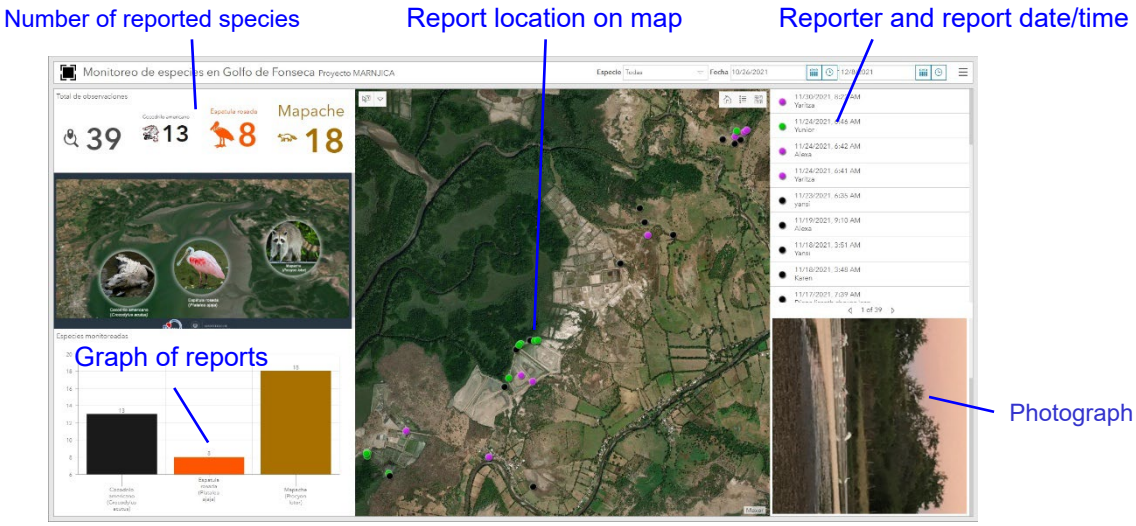


Figure-40 Closed Dashboard (for MARN staff)

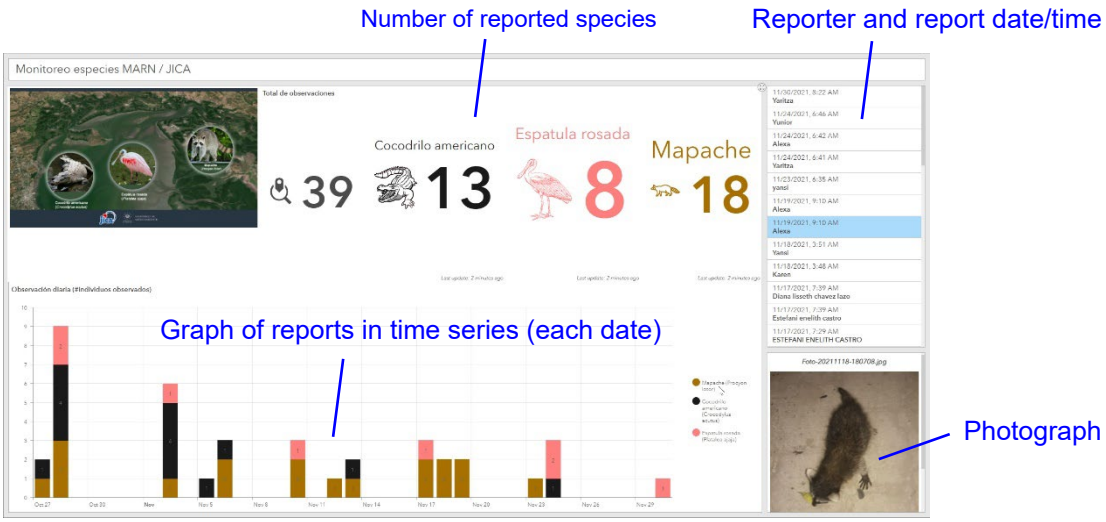


Figure-41 Open Dashboard (for reporters and the general public)

(5) Evaluation of the Demonstration Survey (PoC)

In the Demonstration Survey (PoC), the local subcontractors with cooperation from the MARN rangers visited the village of Barrancones only once a week (travel to and from the village from the capital took 3 days) to teach the local volunteers how to use the app and search for the target species around the village. On other days, the local volunteers conducted the survey work by themselves.

Explanation of how to use the app by the local subcontractors to the local volunteers

Survey in areas around the village

Figure-42 Survey with the Local Subcontractors

① Outputs of the demonstration

- Over 5 weeks, around 10 local volunteers sent information on a total of 39 sightings. Reports of numerous sightings were also made by villagers in the course of their everyday lives.
- The local volunteers were extremely positive about participating in the survey. Other villagers who heard about the survey also offered to cooperate.
- In the first part of the survey, numerous sightings were made around mangrove forests. Since this area was a former prawn farm, it is thought that animals were attracted by large quantities of feed. In the latter part of the survey, other animals were spotted in other areas, however, the target species were not seen very much. This accounts for the downward trend in the number of reported sightings on the time series graph displayed on the open dashboard.
- Actual sightings accounted for just under half of the overall number of reports, while the remainder comprised discovered footprints, etc. In terms of scientific survey, actual sightings and footprints should be treated differently, however, both were treated the same here.

② Issues in implementation

- It was intended not to display location information on the open dashboard, however, because the photographs taken by smartphone often contained location information, there was a risk of revealing the whereabouts of locations without realizing it. If a similar system is developed for future Projects/Activities, it will be necessary to clarify the handling of location information included in photographs.
- The app used here had a feature for designating location information on a map, however, this proved to be exceedingly difficult for the citizens. Since many people in developing countries do not know how to read maps, the inputting of location information should basically be made automatic.

③ Cost performance of demonstration

- Because it was possible to use the systems already owned by the implementing agency of MARN (servers and other hardware, and software such as ArcGIS Enterprise, ArcGIS Survey 123, etc.), it was virtually possible to implement the Demonstration Survey (PoC) for no cost. Since it was also possible for the Study Team to develop the survey forms and dashboards with help from the MARN IT team, there were no development costs either. The app on the side of the reporting volunteers was also free to use. If development of the dashboard and app had been outsourced to a contractor, both items would have cost hundreds of thousands of yen.
- Costs were incurred by the local subcontractors who gave explanations to the citizens on the method of use and accompanied them on surveys, however, the overall cost performance of this Demonstration Survey (PoC) was extremely good. (See section (6) for costs in other Demonstration Surveys (PoC)).
- In cost comparison with cases of non-remote implementation, remote implementation becomes more advantageous as the number of targeted citizens increases and the survey period becomes longer. This is because: if dispatching survey personnel to conduct hearing surveys, the number of surveyors must be increased in proportion to the number of targets, and the cost of employing surveyors will increase in proportion to the length of the survey period. On the other hand, in cases of remote implementation such as here, the system development cost basically remains the same regardless of the number of target residents and length of survey period, and moreover, the system operation management cost also hardly changes (provided that the number of targets is not tens of thousands of people). Therefore, as is indicated in the following figure, remote implementation becomes more advantageous as the scale of surveys increases.

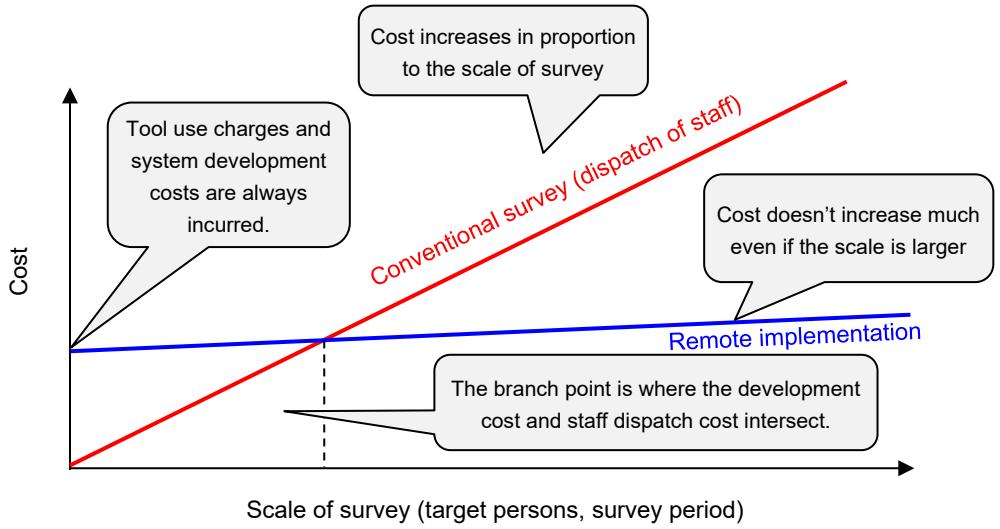


Figure-43 Cost Comparison of Remote Implementation and Conventional Methods of Survey Implementation

④ Future utilization and development (target Projects/Activities)

- MARN rated the system very highly and intends to continue using it even after the end of this Demonstration Survey (PoC). Since MARN already owns the system infrastructure and has a dedicated IT team, there are no technical obstacles.
- Since reporters are local volunteers and the work only entails reporting sightings made in everyday life, it is thought that sustainability is also high on the reporting side. However, it will be necessary to change the target species depending on target areas, season, etc.
- As a program for disseminating and promoting awareness on preservation of biodiversity among citizens, it is reasonable to expanding to other areas. When doing so, an issue will be to determine the kind of incentive to offer people. Rather than offering a cash incentive, it may be more effective to improve the design of the open dashboard and encourage the participation of children and young people especially by implementing as a campaign for stimulating public interest in the preservation of biodiversity.
- It is necessary to recruit rangers or local subcontractors to teach citizens how to use the system. Since the method of use is simple, teaching it requires only a day and it may even be possible to provide online guidance using WhatsApp, etc.
- If the site implementation period had been a little longer, it is thought that the usefulness of this Demonstration Survey (PoC) could have been established. Accordingly, it is hoped that the MARN side seeks to autonomously continue the site survey.

(6) Application to other Projects/Activities in Latin America and the Caribbean

Albeit depending on the design of the survey form, the system has wide applicability to other Projects/Activities because the data inputting is easy and the only equipment required on the reporting side is a smartphone.

Especially in remote areas and other areas that have a fragile internet environment, this system is thought to have high affinity with Projects/Activities in which location information is required and there is room for participation by local citizens (area development, rural development, OVOP, public health and medical care, etc.). Moreover, reporters need not be limited only to local citizens: there are also opportunities for patrolling project staff and local officials to use the system for survey purposes. The following table shows some examples of utilization in other Projects/ Activities.

Table-27 Examples of Potential for Utilization of Demonstration Survey (PoC)2 in other Projects/Activities

Target Field of Projects/Activities	Reporters and Reported Data	Analysis and Uses of Data
One-Village-One-Product Projects/Activities (especially in remote areas)	・ Producers report onsite about each day's products (options) and quantities. ・ Wholesalers, too, give daily reports on sale quantities for each product.	・ It is possible to grasp production conditions and sale trends for each product in villages. ・ Information that can help develop new products is acquired.
Agriculture in remote areas	・ Producers report on conditions in each field (for example, types and quantities of vegetables, growing conditions, etc.) ・ If implementing as a demonstration survey, also give responses about options for comparative experiments on cultivation methods, etc.	・ Cultivation management in each field. ・ By comparing growth conditions in multiple fields, it is possible to extract cultivation methods, areas, terrains, environments, etc. that are suited to each species. (For example, in a mountain area, daylight time can also be calculated from terrain information).
Fisheries	・ Report on each day's fishing grounds, fish schools (visual) and net locations, etc. using only smartphone (there is no need for expensive fish detectors, etc.)	・ Creation and recording of each day's fishing ground map ・ Based on histories, fishing grounds can be estimated according to weather and seasons, etc.
Forest protection	・ Reporting on aromatic trees, indicator trees, etc. targeted for protection (use in tandem with a tree height measurement app[10], etc.)	・ Mapping and monitoring on maps of protected resources.
Public health and medical care in remote areas	・ Public health nurses who patrol households in villages and remote areas report on the health situation in each household. ・ Alternatively, they may report on vaccination status in villages and households. ・ Reporting on infections of endemic diseases or locally prevalent diseases (location information is essential).	・ Automatic mapping of public health conditions in each household and community ・ If it is necessary for multiple public health nurses to conduct concerted activities in a brief time, instructions concerning the shortest and most optimum destination can be automatically issued to each nurse based on real-time conditions in each visited location.

[10] https://play.google.com/store/apps/details?id=com.forest.trees&hl=ja&gl=US

Target Field of Projects/Activities	Reporters and Reported Data	Analysis and Uses of Data
		・ Based on the prevalence of endemic disease and other map information, causes and countermeasures can be identified (as in the case of Schistosomiasis japonica)
Emergency reporting in remote areas	・ Create an app that lets people in remote areas report emergencies from home simply by pushing a button on a smartphone (location information is sent by SMS). ・ Reports can also be made by mountaineers, nomadic people, etc. who are always on the move. However, a mobile line is required. Use in combination with LPWA is also possible.	・ When giving oral explanations by telephone, there are cases where exact addresses or locations are not known, however, if location information and a telephone number can be obtained by SMS, a helicopter ambulance, etc. can be sent to the correct location.

・ Systems, equipment and costs required in implementation

The following equipment and software are required to remotely implement a similar project to this Demonstration Survey (PoC). Moreover, in all software development, when outsourcing, it is desirable to sign a contract that includes 1 year of support and upgrades for bugs, etc. as standard contents.

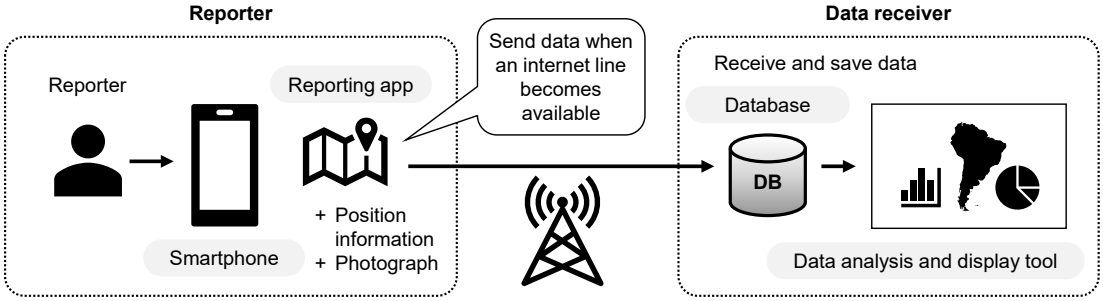


Figure-44 Equipment and Tools Required to Realize a Similar Survey to Demonstration Survey (PoC) 2

The following table shows the necessary specifications and requirements of equipment and tools and gives specific examples of products.

Table-28 Specifications, etc. of Equipment and Tools Required to Realize a Similar Survey to Demonstration Survey (PoC) 2

Equipment/Tool	Specifications/Conditions	Specific Product Examples
Smartphone	・ GPS feature, camera ・ It is possible to embed location information into photographs that are shot (not essential)	・ Almost all models are applicable
Reporting app	・ Even ordinary citizens who do not have expertise can easily perform inputting (important) ・ Data can be inputted even in locations that have no internet access (important) ・ It is possible to send inputted data to a cloud ・ It is possible to (automatically) input location information. Or it is possible to manage photographs that are embedded with location information. ・ It is possible to (automatically) input the reporting date and time. ・ It is preferable if the app can read and execute a separately designed survey form (so that it can be used for surveying multiple differing contents)	・ ArcGIS Survey 123 (app version) ・ Input for QGIS ・ If it is not necessary to input the location using a map, it is also possible to use a survey form app that can send images assuming that location information is embedded in photographs. However, this is limited to an app that has an offline inputting feature. ➢ Zoho Forms ➢ Jotform ➢ etc.
Database	・ It needs to be on a cloud (internet server) ・ Linkage with the reporting app is necessary (user login, etc.) ・ It is possible to conduct optional operations (creation, reading, updating, deletion) in respect to the data that is sent by reporters.	・ ArcGIS Survey 123 (server) ・ Mergin for QGIS (service) ・ General database server (MySQL, Oracle, SQL Server, etc.) ・ General cloud database (AWS, Azure, Google Cloud, etc.)
Tool for analyzing and displaying data	・ It is possible to display location information on a map. ・ It is possible to compile graphs from numerical data ・ Once it is configured, it is automatically updated when data is added. ・ It is possible to display multiple graphs and maps on a single screen (dashboard)	・ ArcGIS (server) ・ QGIS (desktop only) ・ BI (Business Intelligence) tool ➢ Microsoft Power BI ➢ Tableau BI ・ Google Data Portal + Google Map

The following paragraphs describe a number of the most appropriate combinations of the above equipment and tools.

・ ArcGIS Survey 123

This is the system that was used in this Demonstration Survey (PoC). Its greatest merit is that it is extremely easy to use for reporters, and since it is provided by the largest provider of GIS, it is extremely well designed down to the finest details. When designing survey forms and dashboards on the survey implementing side, it is necessary to have knowledge concerning system operation, however, since there are a wide range of tutorials, and numerous operating videos (including Spanish language versions) are available on YouTube, etc., it is not difficult to use once you

become accustomed to it. The cost differs between the case where a server product is purchased and the case where the cloud service is used (subscription). A discount[11] is also available for education agencies.

Table-29 Basic Cost of Using ArcGIS Survey 123

Mode of Use	Costs on the Reporter Side	Costs on the Survey Implementing Side
If buying the server product	・ Free (for both open and closed surveys)	・ ArcGIS Enterprise (1,000,000 yen or more)[12]
If using the cloud service	・ Free (open surveys) ・ Charged (in case of an closed survey, about 19,800 yen per person per year)	・ ArcGIS Online Creator (subscription, roughly 99,000 yen per year)[13]

・ QGIS[14]

QGIS is well known as a free GIS application, however, it is a desktop app intended for experts and researchers who are well-versed in GIS and is not something that can be operated by ordinary citizens. To use QGIS in an activity such as this Demonstration Survey (PoC), it would be necessary to use Input for QGIS[15] as the app for reporters and Mergin for QJIS[16] as the cloud database for storing the sent data[17]. Moreover, although QGIS can be used to analyze stored data, display it on maps and compile graphs, it would be necessary to use a separate BI tool if disclosing the dashboard on the Web. Generally speaking, QGIS-based solutions are inferior to ArcGIS Survey 123 in terms of the ease of use on both the reporting and survey implementing sides. Moreover, since directly connecting Mergin and a BI tool is technically challenging, in many cases it is assumed that cloud data would be used upon reading into QGIS or that the BI tool would be used after downloading the data. Costs are generally as indicated below.

Table-30 Basic Cost of Using QGIS + Input + Mergin + BI

Costs on the Reporter Side	Costs on the Survey Implementing Side
Free (Input for QGIS)	・ Data storage (Mergin: free up to 100MB, 25 Euros per month up to 1GB) ・ Data analysis and display (in case of desktop: QGIS: free) ・ Data analysis and display (case of Web dashboard: BI service is required. For example, Microsoft Power BI costs from 1,090 yen per month per person)

11 https://www.esrij.com/products/arcgis-desktop/prices/academic/
12 https://www.fujitsu.com/jp/group/ssl/resources/news/press-releases/2017/0410.html
13 http://www.t-map.co.jp/products/arcgis.html
14 https://qgis.org/
15 https://inputapp.io/
16 https://public.cloudmergin.com/
17 https://www.youtube.com/watch?v=8AZ9gPAhL_4

4.4 Demonstration Survey (PoC) 3

(1) Outline and objective of the Demonstration Survey (PoC)

Before the outbreak of the COVID-19 pandemic, JICA staff and national staff regularly went out into the field to inspect works, however, following the outbreak of the pandemic in 2020, such trips can no longer be made. Although reports are produced, because monitoring cannot be directly conducted, realistic and practical tools for remote monitoring will be proposed and verified.

Rather than real-time remote monitoring (linear (pipeline), etc.) using drones and so on, equipment and tools that enable monitoring (located (pump stations), etc.) to be conducted based on video sharing and real-time discussions with local staff (drones, PTZ cameras, wearable cameras, high-speed line-compatible smartphones, etc. equipped with online meeting apps, etc.) will be introduced. It is anticipated that the outputs of the Demonstration Survey (PoC) can become pilot examples of monitoring in other Projects/ Activities. Moreover, cost effectiveness of demonstration contents will be verified.

(2) Projects/ Activities targeted for survey

ODA Loan Project that requires remote monitoring: Environmental Improvement Project in the Basin Lake Billings in Sao Paulo State, Brazil (a project mainly for improving the sewerage system that flows into Lake Billings)

Implementation agency for ODA Loan Project: SABESP[18] (Companhia de Saneamento Básico do Estado de São Paulo: Sao Paulo Waterworks and Sewage Corporation)

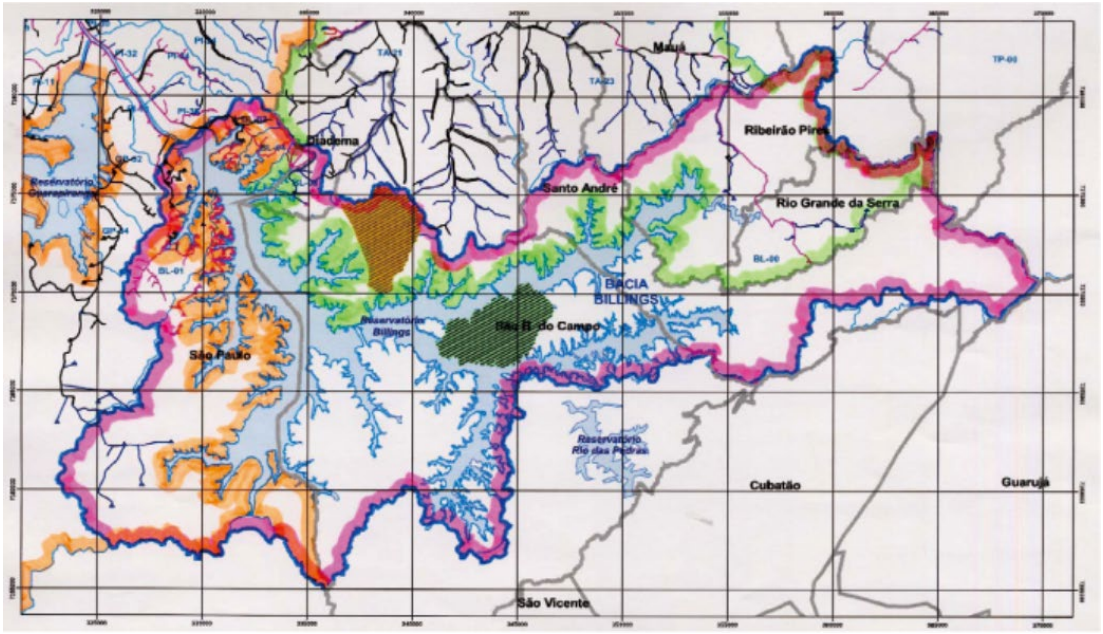


Figure-45 Survey Area for the Environmental Improvement Project in the Basin Lake Billings

[18] https://ri.sabesp.com.br/

Two types of works are being conducted in the demonstration survey (PoC) area. In Lot-1, a number of shafts are located along the thick black line in the right figure, whereas in Lot-2, pump stations will be constructed in the dark gray areas (located). Of these, Esmeralda is one of the main pump stations, where 4 cameras (PTZ, Fixed) were installed, while Lavras pump station had 2 cameras installed.

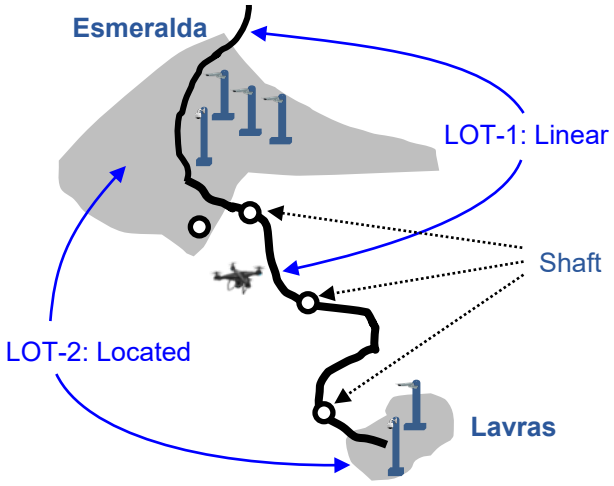


Figure-46 Demonstration Survey (PoC) Area

(3) Implementation contents and schedule of the Demonstration Survey (PoC)

➢ Implementation contents in the Lot-1 Demonstration Survey (PoC) (confirmation of shooting while communicating on Teams)

① Shoot bird's-eye view images from a height of 100 meters to confirm the shaft positions and safety.

② Enter shafts wearing a wearable camera and take pictures to confirm the condition of walls and pipes and the progress of works.

③ Take smartphone pictures to confirm safety around the shafts, workers' wear, oil leaks from equipment, etc.

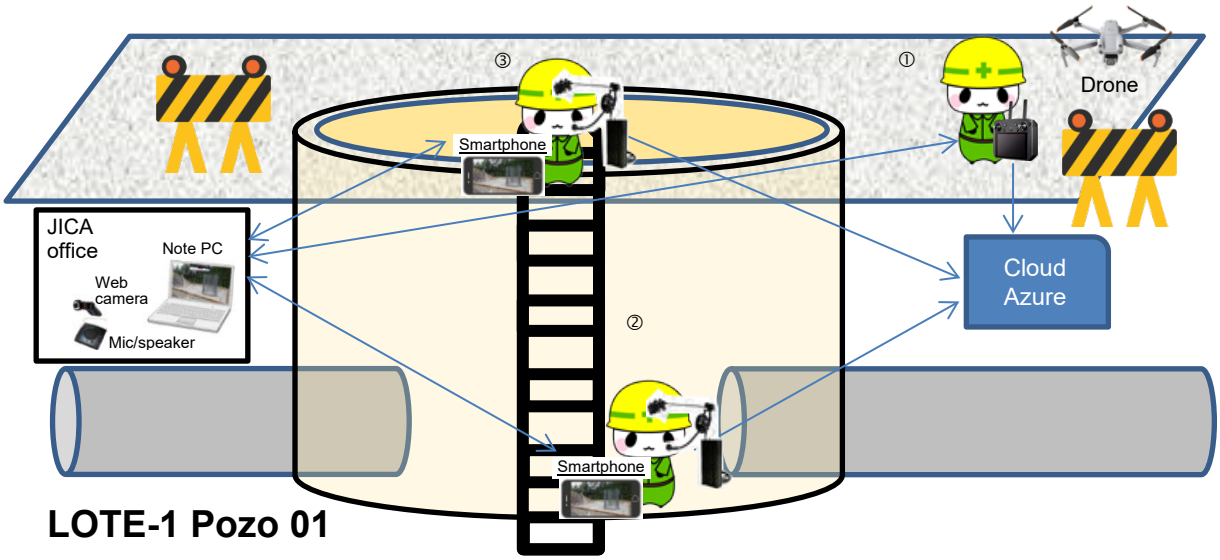


Figure-47 Lot-1 Demonstration Survey (PoC) Contents

➢ Implementation contents in the Lot-2 Demonstration Survey (PoC) (while communicating on a Web meeting system)

① Shoot bird's-eye view images from a height of 100 meters to confirm the pit positions, etc. and safety.

② Take pictures of the overall site and any necessary parts (levee, etc.) using PTZ cameras in Esmeralda

③ Take pictures of the overall site and any necessary parts (works conditions, etc.) using PTZ cameras in Lavras

④ Take pictures to confirm inside pump stations and pits using PTZ cameras in Esmeralda

⑤ Take pictures to confirm inside pits using the fixed cameras in Lavras

⑥ Take pictures to confirm inside pits and pump stations using wearable camera and smartphone.

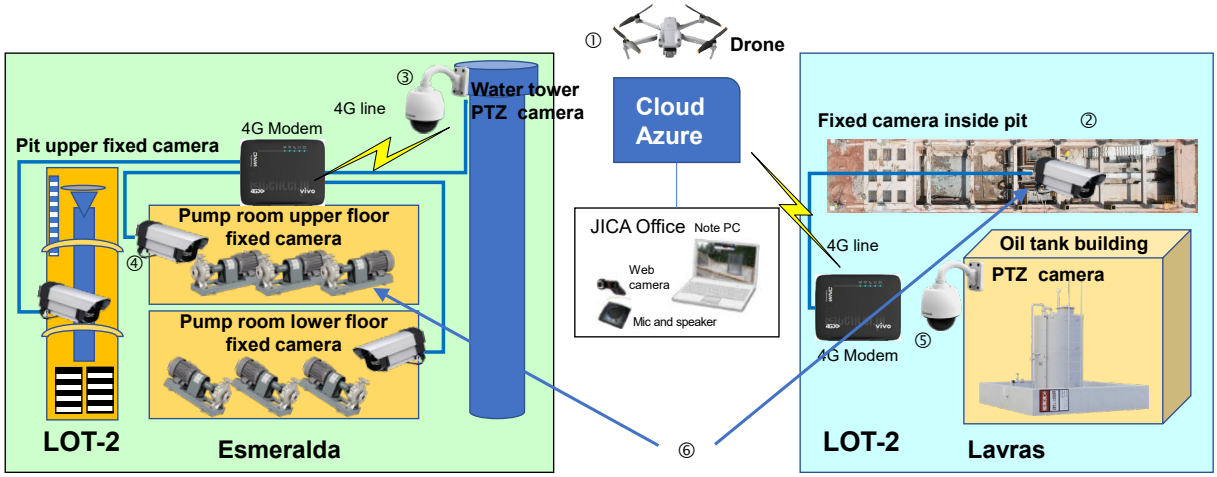


Figure-48 Contents of Lot-2 Demonstration Survey (PoC)

The survey procedure and schedule are as shown in the following two tables.

Table-31 Demonstration Survey (PoC) 3 Implementation Contents

Survey procedure	Implemented contents
1. Gather information from the JICA Brazil Office and implementation agency (SABESP) involved with the selected Project/ Activity.	The JICA Overseas Office was requested to participate in the Demonstration Survey (PoC), and consent for participation was obtained from the Office and implementation agency.
2. Procure equipment and tools required for remote monitoring of the local area. (Outsource to a local contractor)	The TOR for selecting the subcontractor was create and sent to more than 10 potential contractors. The TOR also included procurement of equipment and tools.
3. Provide information to the subcontractor and implement the installation works (Demonstration Survey (PoC) of site recording by wearable cameras and real-time videos shot by drones, etc.)	After signing the contract with the subcontractor, information concerning the Demonstration Survey (PoC) methods, equipment use methods, network building and image recording methods, etc. was provided; suggestions were received from the subcontractor, and the optimum Demonstration Survey (PoC) methods were established.

Survey procedure	Implemented contents
4. Implement the Demonstration Survey (PoC) using the selected equipment and tools	Lot-1 of the Demonstration Survey (PoC) contents was implemented: ① Recording of bird's-eye images by drone, ② Shooting of images inside shafts by wearable camera, and ③ Shooting of images around the shafts by smartphone. Concerning Lot-2, ① Recording of bird's-eye images by drone and time-lapse images by PTZ camera and fixed camera, and ③Shooting of images inside pits by wearable camera and smartphone, were implemented.
5. Feedback from the subcontractor and stakeholders, evaluation and analysis	Based on the results of feedback from the subcontractor and stakeholders, evaluation and analysis, the findings were compiled together with recommendations for utilization of the demonstration contents in other Projects/ Activities in Latin America and the Caribbean.

Table-32 Demonstration Survey (PoC) 3 Schedule

Survey procedure	Period	2021 年 6	7	8	9	10	11	12
1. Information collection from the JICA Brazil Office and local implementation agency (SABES) concerning the selected Project/ Activity	6weeks							
2. Procurement of the necessary equipment and tools for local monitoring (consignment to a local subcontractor)	4weeks 9weeks							
3. Information provision to sub-subcontractors (how to record on site using a wearable camera, remote site surveying methods using drone, etc. and based on real-time video sharing, etc.)	4weeks 6weeks							
4. Implementation of Demonstration Survey (PoC) using the selected devices and tools	4weeks 4weeks							
5. Feedback from to subcontractors and stakeholders, evaluation and assessment	2weeks 2weeks							
6. Other (support from Japan, etc.)	General							

PLAN Performance

Background up to Demonstration Survey (PoC) implementation (local examination of 5G)

It was originally intended to use local 5G, however, deeming that it was too early to utilize 5G for the following reasons, it was decided to utilize the current technology and environment instead.

- Cost of building local 5G (since the cost would have amounted to hundreds of millions of yen, it was deemed unfeasible for introduction to a Demonstration Survey (PoC))
- Network environment in Latin American countries (not possible to send images, etc.)
- Local 5G technology (even in Japan, the technology is undergoing demonstration testing and has not yet been established)

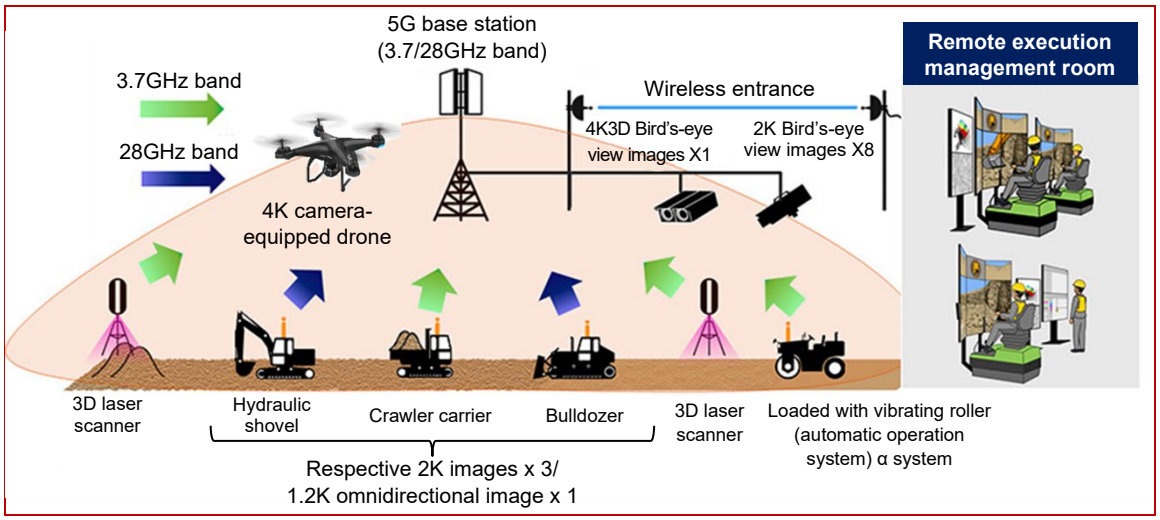


Figure-49 Examined Case of Using Local 5G

The 5G model that was initially examined is indicated below.

① Remote drone operation (mounted with high-definition 4K camera)

Drones can be sent flying remotely by using 5G line from the JICA Office in real-time. However, due to flying restrictions, this is not yet permitted even in Japan.

② 3D laser scanner topographical and geological analysis

It is possible to analyze terrain and geology by topographical laser scanning. This is useful for conducting excavation and reinforcing tunnels, etc.

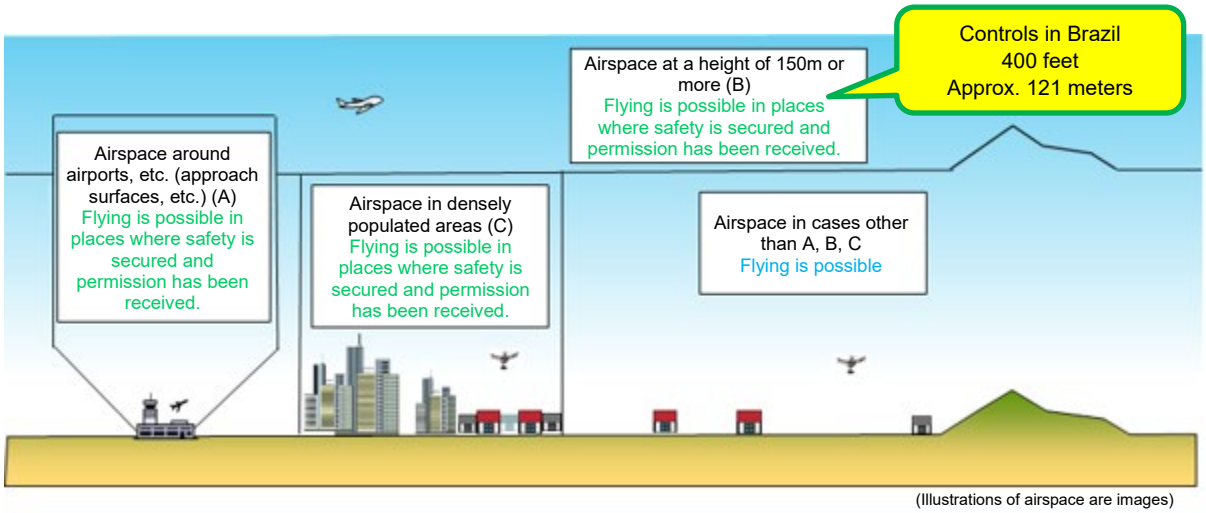
③ Verification on completion of works (remote inspection, etc.) is possible.

It is possible to remotely implement more detailed inspections.

④ Unmanned construction machines (hydraulic shovels and bulldozers)

Heavy machinery can be operated without personnel for constructing foundations in levee works and construction projects.

Drone flying restricted areas



Weight (total weight of drone body and battery): Drones weighing less than 200 grams are classed as "model planes", not unmanned aircraft, and do not require notification, etc.
In Brazil, drones weighing up to 250 grams, for which ANAC manages permission and registration, do not need to be registered, however, notification is required if flying around hospitals, high-speed roads, etc.

Controls in Brazil
250 grams or less

Figure-50 Drone Flying Restricted Areas (from the MLIT website)

Demonstration Survey (PoC) implementation conditions

- Following the procurement of equipment (cameras), the camera installation work was started in earnest at the end of November. Demonstration Survey (PoC) was implemented on Lot-1 Shaft 11 on December 3, Lot-1 Shafts 7-10 on December 7, Lot-2 Lavras 1 on December 10, Lot-2 Esmeralda on December 14, and Lot-2 Lavras 2 on December 21. All the surveys were implemented in the morning and were blessed with various weather conditions (fine days, cloudy days, rainy days). As a result, it was possible to conduct shooting under various conditions.
- Images from the Demonstration Surveys (PoC) were uploaded to the Cloud (Azure) and placed on SharePoint and YouTube for limited viewing.
- Shooting of works conditions by the PTZ cameras and fixed cameras installed in Esmeralda and Lavras at the end of November was continued until the end of December and the data was stored on NVR. Based on the images, time-plus images were created, and these were also uploaded to the Cloud (Azure) and placed on SharePoint and YouTube for limited viewing.

Table-33 Contents and analysis, etc. in each Demonstration Survey (PoC)

Date and weather	Implemented location	Implemented survey contents	Analysis, etc.
December 3 Fine	Lot-1 Shaft 11	① Bird's eye shooting of Shaft 11 by drone ② Shooting inside shaft and pipes by wearable camera ③ Checking by smartphone of security around the shaft, oil leaks from equipment, workers' wear, etc.	① Bird's eye shooting from a height of 100m. In certain areas, permission was only granted for shooting of Shaft 11. ② Poor communication due to not wearing a wearable camera or microphone ③ Communication using a smartphone was OK, with security, etc. confirmed to be good.
December 10 Fine	Lot-1 Shaft 7-11	① Bird's eye shooting of Shafts -10 by drone ② Shooting inside shaft and pipes and of works conditions by wearable camera wearable camera ③ Confirmation of fences and traffic issues around the shafts	① Permission for drone shooting was obtained to shoot Shafts 7-10. ② A high-sensitivity mic and receiver were fitted, however, communication was interrupted by the sound of ventilation inside shafts. Countermeasures will be examined for next time. ③ There was no human traffic control, however, signs gave information and fences were effective during the works.
December 14 Cloudy	Lot-2 Lavras First time	① Shooting by drone wasn't possible. ② Shooting of buildings under construction by PTZ camera ③ Shooting inside pits by smartphone	① Permission was not received for flying a drone. ② The zoom function, etc. of the PTZ camera didn't work well when the line conditions were poor. ③ Electromagnetic loss occurred due to iron mesh and iron blocks inside the pits, so an antenna extension was connected.
December 17 Cloudy, rain	Lot-2 Esmeralda	① Bird's eye shooting by drone from a height of 100m was conducted of the buildings and surrounding areas of the pump stations, pits, office, etc. ② Conditions inside the pump stations were shot by wearable camera while communicating. ③ Shooting by PTZ camera and fixed camera (screen control)	① Permission was received for flying a drone (4 days between application and granting of permission; expressway-related) ② Because the electric wave environment was good, there was no problem with shooting. The audio devices were changed and proved successful in testing. ③ Because there was no problem in lines, smooth shooting was possible. Good line conditions were realized through 4G modem and router installation.
December 21 Fine	Lot-2 Lavras Second time	① Bird's eye shooting by drone from a height of 100m was conducted of the buildings and surrounding areas of the pits, office, etc. ② Conditions inside the pits were shot by wearable camera while communicating ③ Shooting by PTZ camera and fixed camera of buildings under construction	① Permission was received for flying a drone (10 days between application and granting of permission; expressway-related) ② Because the electric wave environment inside pits was poor, an antenna extension was connected from the start and the communication and shooting went well. ③ Since Lavras is a poor location for 4G waves, the PTZ didn't work well, however, conditions were improved with connection of an antenna extension.

(4) Equipment and tools used in the Demonstration Survey (PoC)

The following table shows the equipment used in the Demonstration Survey (PoC), and the specifications of equipment.

Table-34 Equipment Used in the Demonstration Survey (PoC)

PTZ Camera	Fixed Camera	NVR	UTM & Router
			
Model: DS-2DE5232IW-AE ・ 1/2.8" progressive scan CMOS ・ Up to 1920×1080 at 30 fps 32× ・ optical zoom, 16× digital zoom ・ IP66 ・ ONVIF, ISAPI and CGI	**Model: DS-2CD2085G1-I** ・ High resolution up to 8M pixels ・ Max. 3840 × 2160 at 20 fps ・ 2.8 mm/4 mm/6 mm fixed lens ・ IP67, IK10	**DS-7100NI-Q1/P/M NVR** ・ Input 40/60 Mbps ・ output 60 Mbps ・ 4/8 PoE NW interfaces ・ 1080p decode 6TB Capability ・ HDMI and VGA output	**Model: Fortigate 40F** ・ https://www.fortinet.com/content/dam/fortinet/assets/data-sheets/ja_jp/FG-40F_DS.pdf
Modem 3G/4G	**Smartphone**	**DRONE**	**Wearable Camera**
			
Model: WNC- WLD71-T5 ・ FDD: 150Mbps DL and 50Mbps UL ・ Support 20MHZ bandwidth ・ LTE Antennas Internal ANTx2 ・ External ANT x 2 units ・ Bandwidth (max) 300 Mbps@ ・ 40MHz bandwidth	**Model: Note 20 Ultra 5G** ・ Operating System: Android ・ Processor Core: ・ Internal Memory: 256GB ・ Front Camera: 4K ・ Shoot (Rear Camera): 8K	**Model: DJI Air 2S- 20MP** ・ Camera with 1-inch sensor ・ Video recording in 5.4K, 4K ・ Obstacle sensors on the front, bottom, back and top ・ Control in up to 12km distance ・ Flight time up to 31 minutes	**Model: GoPro MAX360** ・ Resolution: 5.6K ・ Video resolutions: 4992x2496 ・ Waterproof ・ Shoots 360° Degrees

Also, the following equipment and tools were used.

- Web meeting system : Microsoft Teams
- Cloud system : Azure
- Microsoft SharePoint : Microsoft office
- Limited viewing : YouTube
- Antenna extension : Extension 4G antenna + Cat6 LAN cable

(5) Evaluation of the Demonstration Survey (PoC)

① Outputs of demonstration

・ Establishment of remote monitoring methods

The remote monitoring method, whereby image data from wearable cameras, smartphones, drones, and PTZ and fixed cameras is uploaded for sharing to a cloud via an IP network, was

established. Specifically, by using the following existing technologies in i-iii, it is possible to constantly monitor the necessary locations remotely.

i In monitoring that used the various cameras, real-time sharing of images by MS Teams was confirmed. 4K images (concrete spraying, etc.) shot by wearable camera can be seen in high resolution through even a MS Teams screen.

ii Images from the Demonstration Survey (PoC) were uploaded to the Cloud (Azure) and placed on SharePoint and YouTube for limited viewing. SharePoint images have higher resolution than MS Teams shared images.

iii It was possible to access and operate the 6 located cameras (PTZ, fixed) from SharePoint.

・ System building for efficient communication

By using MS Teams, staff members in the office could instruct workers on the ground to check specific parts or work areas while viewing the same images, and the workers on the ground could shoot and record images as instructed. Therefore, it was possible to efficiently conduct communication. The communication was conducted while confirming the following i-iii.

i MS Teams could be used by all participants to communicate while checking the same images.

ii In the first Demonstration Survey (PoC), interruptions to sound (caused by impact of noise from ventilation fans) arose due to forgetting to attach mics. Through testing various types of receivers and mics, sound and communication were improved.

iii Workers on the ground received instructions from the JICA Brazil Office to operate cameras and visually check for oil leaks in equipment, check safety wear and so on.

② Issues and proposals

<u>Issues in implementation</u>

・ The communications infrastructure environment is important (it is vital to prepare the communications infrastructure before the works).

- It is necessary for sites targeted for remote monitoring to have an internet environment. However, because this Demonstration Survey (PoC) targeted a works site, the communications infrastructure was fragile. Much of the used equipment was impacted by the line speed. (If electric waves are weak, movement is impacted).
- The strength of electric waves varies according to area and shape. It was thought that electric waves would not be affected inside pits, however, it was found that iron mesh and iron blocks had an impact. It is necessary to prepare alternative plans in advance (antenna extension cable, etc.).

・ Grasp the areas where drone flying is restricted and apply for permission to fly drones.

- Since drone flying restrictions differ in each country, it is necessary to grasp them in advance.
- It is also important to understand each country's or area's characteristics when applying for and receiving permission.

・ Items concerning equipment procurement

- Local procurement taxation issues (a tax exemption letter, etc. is required).
- Longer procurement lead time due to the shortage of semiconductors (there are cases where equipment cannot be procured in time for works)

・ Countermeasures in areas with poor security

- In areas of poor security, where theft is a commonplace problem, installed cameras and equipment are likely to be stolen. In this Demonstration Survey (PoC) too, equipment in Lavras Area was stolen when guardsmen were not on duty. Accordingly, assigning guard personnel and using infrared alarm systems are also issues.

Proposals concerning equipment

In the remote monitoring here, since pipes were large enough for staff to enter, it was possible to manually shoot images inside the pipes, however, at first it was not envisaged that pipes would be this large. Since it was necessary to keep records of concrete spraying, etc. at pipe joints and points of reinforcement inside tunnels, we examined methods for shooting images inside pipes and tunnels that people cannot enter. The equipment and tools that were examined are introduced here because they may prove to be useful for conducting remote monitoring in other countries.

・ Micro drones capable of flying inside pipes (now undergoing demonstration testing)
・ Mounting of wearable cameras on radio-controlled cars (fragile on poor quality roads)
・ Endoscopic camera (maximum 120m)
・ Self-running camera (by fitting caterpillar tread, it can travel on poor roads, too)

Figure-51 Micro Drone Flying Inside a Pipe

Next, the “trolley consolidated communication system” is introduced as equipment for conducting remote monitoring in places that have no power sources or lines. To overcome the power shortages and weak electric waves that were actually experienced in the Demonstration Survey (PoC), the trolley is equipped with various communication devices (router and modem) and cameras so that it can conduct monitoring anywhere. This is a proposal by the subcontractor Luz Digital Inc.

Composition of the trolley consolidated communication system

- Solar system
- Mobile antenna
- Fixed camera
- PTZ camera
- Low-orbiting satellite antenna
- Generator or voltage stabilizer
- Router, modem, etc.
- Wi-Fi access point

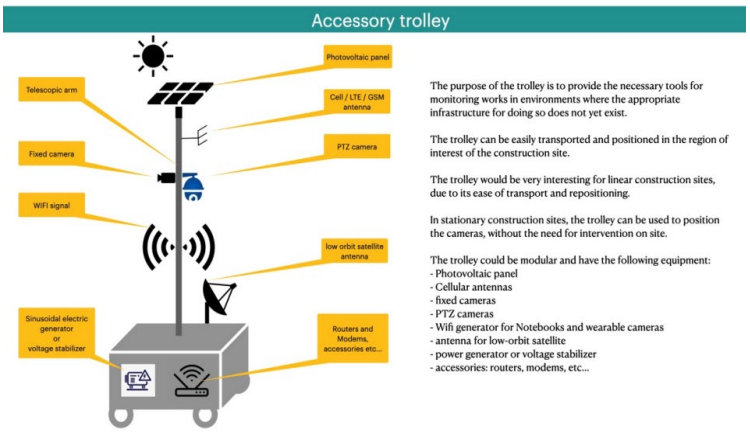


Figure-52 Trolley Communication System Proposed by Luz Digital Inc.

③ Demonstration Survey (PoC) cost performance

Since high-spec equipment was used in this Demonstration Survey (PoC) (to ensure that the Demonstration Survey (PoC) would not be restricted and to leave geological and topographical records), it is not possible to make any general conclusions about cost effectiveness. Assuming that existing lines are used, economical equipment costs were calculated in light of the experience of this Demonstration Survey (PoC), and the number of years required to recover the costs including maintenance costs was calculated. However, the effectiveness of introducing this system over the entire region of Latin America and the Caribbean (not only cost effectiveness but also extension of remote monitoring knowhow to other areas) should also be evaluated.

Table-35 Cost Table (Equipment and Personnel Costs, etc.)

(Currency unit: BRL)

Item	Details	Qty	Unit price	Total price
Equipment	Wearable camera	2	7,000	14,000
	Drone	Rental		
	Fixed camera	4	1,700	6,800
	PTZ camera	2	21,500	43,000
	Smartphone	2	4,200	8,400
	Note PC	3	5,600	16,800
	4G/3G FG-40F	8	6,200	49,600
	4G/3G Modem	8	400	3,200
	Works cost (fixed and PTZ cameras)	6	1,000	6,000
	Total			147,800
Personnel expenses, etc.	IT engineer	128	200	25,600
	Drone engineer	64	200	12,800
	Monitoring camera engineer	1	12,500	12,500
	Network engineer	1	76,500	76,500
	Install S	6	300	1,800
	Cloud/Server	1	7,500	7,500
	Total			136,700
Price total				284,500

Table-36 Lot-1 Cost Table (Equipment and Personnel Costs, etc.)

(Currency unit: BRL)

Item	Unit price	Qty/Time	Total	Remarks
Drone	8,000	1	8,000	
Wearable camera	7,000	1	7,000	
Smartphone	4,200	1	4,200	
Note PC	5,600	1	5,600	
Personnel costs (operation, etc.)	200	40 hours	8,000	2H×4d×5
	Total (5 surveys per year)		32,800	Approx. 680,000 yen[19]

Table-37 Lot-2 Cost Table (Equipment and Personnel Costs, etc.)

(Currency unit: BRL)

Item	Unit price	Qty/Time	Total	Remarks
Drone	8,000	1	8,000	
Wearable camera	7,000	1	7,000	
Smartphone	4,200	1	4,200	
PTZ camera	21,500	1	21,500	
Fixed camera	1,700	2	3,400	Main P4, P1
Note PC	5,600	1	5,600	
Works cost	300	3	900	
Personnel costs (operation, etc.)	200	40 hours	8,000	2H×4d×5
	Total (5 surveys per year)		58,600	Approx. 1.2 million yen[19]

[19] Yen conversion 20.69 yen/BRL (January 17, 2022)

Cost effectiveness in this case may be regarded as follows.

Airfare	:	Return flight 25,000 yen×2 ＝50,000 yen
Number of surveys	:	5 times/year, 2 person
Daily allowance	:	3,200 yen, 4 nights
Accommodation cost	:	9,700 yen, food cost:4,800 yen
Total travel cost	:	(50,000 yen＋141,600 yen) X5 times＝958,000 yen (JICA Travel Expense Regulations)

Lot-1	cost/year	:	680,000 yen
Lot-2	cost/year	:	1,200,000 yen
	Total	:	1,880,000 yen

Annual maintenance cost
(10% of invested amount): 188,000 yen

Based on the above calculations, it will be possible to recover investment and go into the black as follows.

2,036,100 yen ÷ Annual business travel cost 958,000 yen
=Recovery in approx. 2 years 6 months

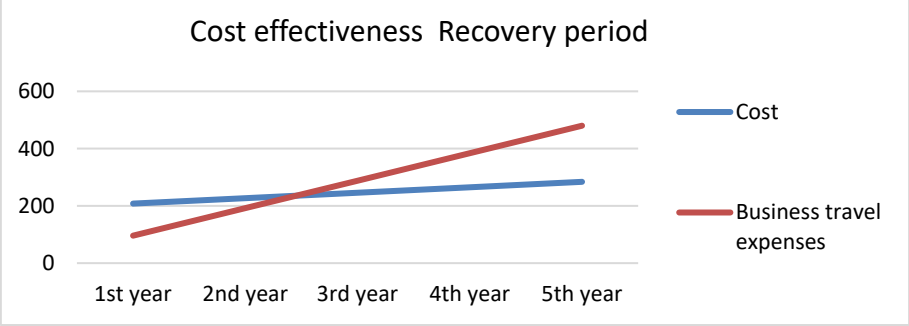


Figure-53 Cost Effectiveness Simulation of Cost Recovery Period

The above simulation shows only a simple comparison of business travel costs, however, other cost reductions can be considered in terms of elimination of travel time and so on. Moreover, drones have additional secondary effects such as enabling bird's eye views of sites that cannot be grasped from the ground and providing images for use in public relations activities and so on.

Simulation in case targeting the entire Lake Billings (sewerage project)

The sewerage system improvement project covering the entire area of Lake Billings targets the 21.8km Koros trunkline and includes 3 main pump stations, 6 pump stations and 72 manhole shafts (including 6 main shafts). Simulation was conducted and the overall amount of investment was calculated assuming the implementation of remote monitoring over the entire area of Lake Billings.

Table-38 Comparison Table of the Sewerage System Improvement Project Entire Area and Demonstration Survey (PoC) Target Area

Facility	Entire area	Demonstration Survey (PoC)target	Remarks
Koros trunkline	21.8km	4.4km	
Main pump stations	3 locations	1 location	
Pump stations	6 locations	1 location	
Manhole shafts	72 locations (including 6 main shafts)	12 locations (including 1 main shaft)	Actual monitoring was implemented in 5 locations (including 1 main shaft)

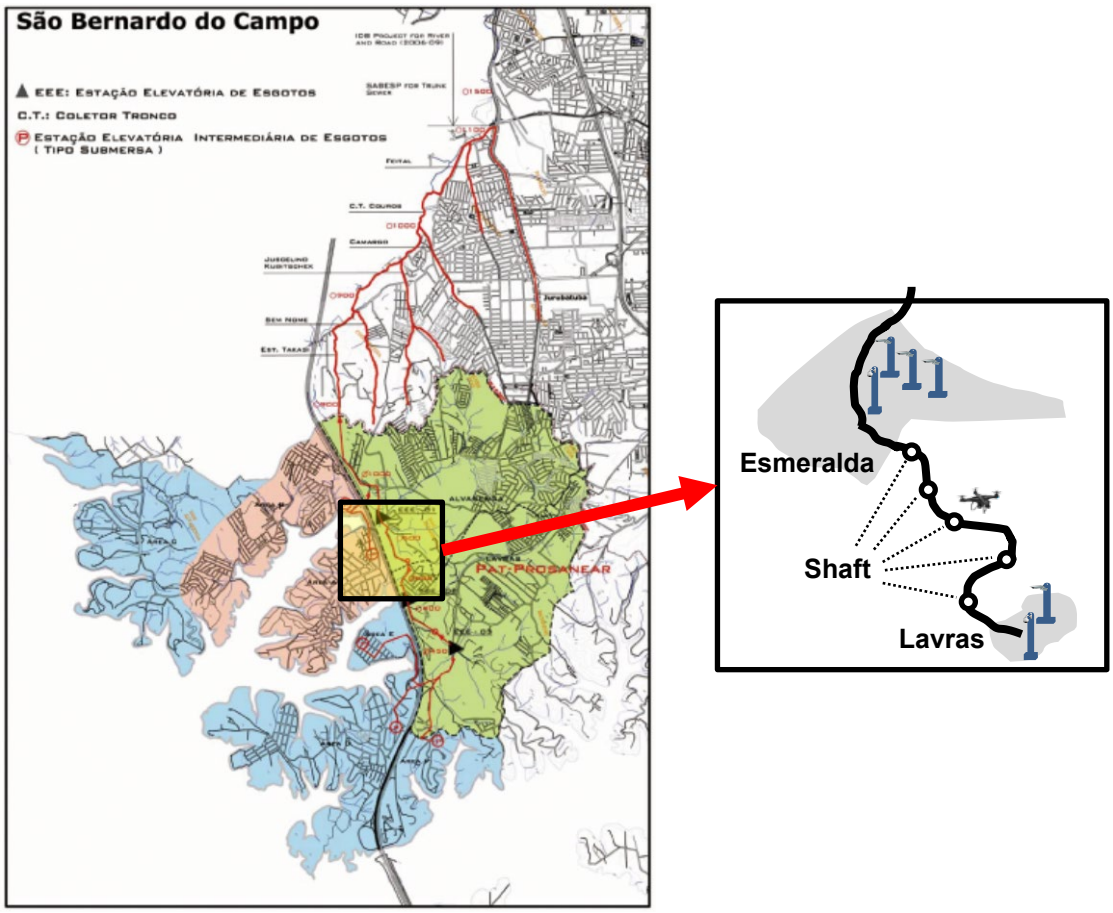


Figure-54 Sewerage System Improvement Project Entire Area (Green Area) and Demonstration Survey (PoC) Target Area (Right Projection)

Based on the results of the Demonstration Survey (PoC), it is thought that the following equipment will be used for remote monitoring.

- For monitoring of manhole shafts, drone, wearable camera, note PC, and smartphone will be used. The monitoring will only target the main shafts[20].
- For monitoring of main pump stations, in addition to the above shaft equipment, 1PTZ camera and 3 fixed cameras will be used.
- For monitoring of pump stations, in addition to the above shaft equipment, 1 PTZ camera and 1 fixed camera will be used.

The following table shows the equipment and personnel costs for each facility.

Table-39 Equipment and Personnel Costs, etc. for Each Facility

(Currency unit: BRL)

Item	Unit price	Shafts		Main pump stations		Pump stations	
		Qty/ Hours	Total	Qty/ Hours	Total	Qty/ Hours	Total
Drone	8,000	1	8,000	1	8,000	1	8,000
Wearable camera	7,000	1	7,000	1	7,000	1	7,000
Smartphone	4,200	1	4,200	1	4,200	1	4,200
PTZ camera	21,500			1	21,500	1	21,500
Fixed camera	1,700			3	5,100	1	1,700
Note PC	5,600	1	5,600	1	5,600	1	5,600
Works cost	300			4	1,200	2	600
Personnel cost (operation, etc.)	200	40h	8,000	40h	8,000	40h	8,000
			32,800		60,600		56,600

Therefore, the cost of implementing remote monitoring over the entire area of the sewerage system improvement project is 718,200 BRL (approximately 15 million yen).

Table-40 Cost of Remote Monitoring of the Entire Area

Facility	Unit cost (BRL)	Qty	Total
Manhole shafts (only targeting main shafts)	32,800	6	196,800 BRL
Main pump stations	60,600	3	181,800 BRL
Pump stations	56,600	6	339,600 BRL
		Yen amount 14,859,558 yen	718,200 BRL

Comparison between remote monitoring and travel for onsite inspection

In the midst of the COVID-19 pandemic, site inspections are being replaced with remote monitoring. Concerning whether remote monitoring should be continued or site inspections should be resumed following the end of the pandemic, the following table summarizes the merits and demerits of each case.

[20] When implementing the Demonstration Survey (PoC), an official in charge in SABESP said that monitoring of main shafts only was sufficient for the shafts.

Table-41 Comparison between Remote Monitoring and Travel for Onsite Inspection

Comparison item	Remote monitoring		Travel for onsite inspection	
	Merits	Demerits	Merits	Demerits
Data recording, etc.	Almost all records remain. Checking can be done while giving instructions. Pinpoint checking can be done with high-resolution images.		The acquired data can be kept	Since onsite workers take the initiative, the desired data may not be obtained.
Initial investment		Initial investment is incurred.		
Travel costs, maintenance costs	There are no travel costs.	Maintenance costs are incurred.		Travel costs are incurred. If locations are distant, accommodation costs are incurred.
Site environment and atmosphere	Sites and conditions that cannot be noticed on the ground can be confirmed.	Odors, staining, etc. cannot be sensed.	Odors, etc. can be sensed. The site atmosphere can be sensed.	Weather conditions have an impact.
Other	Screens can be switched quickly, eliminating time losses.	Dependent on networks	Opinions of local residents can be heard. Safety can be confirmed. Ample time can be taken.	

④ Future utilization and development potential

Utilization in SABESP

One of the reasons for the success of this Demonstration Survey (PoC) was that cooperation was forthcoming from SABESP, which is the implementation agency for the ODA Loan Project. SABESP was pleased with the Demonstration Survey (PoC) equipment and stated the desire to continue using it from now on.

- PTZ cameras and fixed cameras are installed in major locations and can be used to conduct remote monitoring when conducting trial operation of power supply and confirming pump installations, etc. in the future.
- Detailed images of foundations and levee works (Esmeralda) and recorded images of works conditions, etc. taken with the PTZ cameras can be utilized as sample images in future works.
- Images shot with fixed cameras can be used as time-lapse images showing the progress of works and in public relations materials, etc.
- If the ICT infrastructure is further improved from now on, PTZ camera movements will become smoother and it will be possible to save better images in line with line improvements.

- Concerning PTZ camera operations, because training (tutorial in PTZ camera operation) was conducted for staff of the JICA Brazil Office and SABESP, staff can smoothly operate cameras.

Utilization in JICA Brazil Office

The JICA Brazil Office will be able to apply remote monitoring using drones and wearable cameras, etc. for confirming site conditions in other ODA Loan Projects in the country.

Extension to other areas

Extending as a remote monitoring system to other areas is considered to be meaningful in terms of the following points.

- Drones makes it possible to easily conduct operation and acquire bird's-eye view images.
- Wearable cameras make it possible to use 4K cameras equipped with mic and receiver functions that are effective for remote monitoring.
- PTZ cameras have pan-tilt-zoom functions that make it possible to conduct various types of monitoring over a 360-degree range.
- Drone images are also useful for gaining a multifaceted understanding of Projects/Activities before even debating remote implementation.

However, an issue is that it is necessary to select a subcontractor that is endowed with ICT skills. Therefore, when selecting the subcontractor, it is necessary to create a TOR of selection conditions (conditional on having ICT skills, communication network skills, etc.) and issue a requirements document which includes an equipment list stating technical specifications that comply with the objectives of the remote monitoring.

(9) Application to other Projects/Activities in Latin America and the Caribbean

The following table shows examples of use of the equipment that was used in Demonstration Survey (PoC) 3.

Table-42 Examples of Use of the Equipment Used in Demonstration Survey (PoC) 3

Equipment	Examples of use
Drones	・By confirming bird's-eye views, it is possible to ascertain site positions and conditions. ・Can be used for monitoring works conditions, schedule progress, security, etc.
Fixed and PTZ cameras	・Timelapse images can be used to grasp works conditions and progress. ・Wide-view monitoring (recording) can be performed based on omnidirectional, up/down and zoom shooting.
Wearable camera and smartphone	・Geology of walls, etc. and works conditions, etc. can be analyzed based on 4K images ・Monitoring can be performed while communicating.

Also, the following table shows possible examples of use addressing the issues that were raised by other JICA Overseas Offices in Latin America and the Caribbean in the preliminary questionnaire.

Table-43 Possible Examples of Use Addressing Other Issues

Raised issues	Examples of use
Utilization of drones in the solid waste management project	・ In addition to drones, by installing PTZ cameras to poles and conducting timelapse management, etc., it will be possible to efficiently manage solid waste.
Project site monitoring and communication system building	・ It should be possible to conduct remote monitoring of project sites using wearable cameras, smartphones, and a Web meeting system.
Monitoring of project implementation from the capital city to regional cities	・ If it is a country with a good ICT environment, in addition to installing PTZ cameras, fixed cameras, etc., it should be possible to conduct remote monitoring of project sites using wearable cameras, smartphones, and Web meeting system.

4.5 Demonstration Survey (PoC) 4

(1) Outline and objectives of the Demonstration Survey (PoC)

This survey was implemented with the objectives of creating prototype e-learning teaching materials and conducting online learning via LMS with a view to raising the IT literacy, i.e. improving the IT skills required on sites, for the staff in JICA Overseas Offices. JICA-VAN was used for the LMS. The survey was advanced according to the procedure illustrated below. In ①, real-time orientation was implemented, operation of the LMS was explained, and the e-learning teaching materials were introduced with simultaneous interpretation. In ② prototype online teaching materials comprising the contents that were decided upon reviewing the results of the questionnaire survey that was reported in Progress Report 2 were created and the effects of introduction were verified in on-demand e-learning. In ③, the wrap-up session was conducted in real-time on November 18, 2021. In this, a report was made on the results of LMS e-learning implementation including access logs, etc.; the learned prototype contents were reviewed, and feedback was obtained from the participants. Following the wrap-up, questionnaires were sent to the participants and the results were summarized. During the e-learning trial implementation period, the LMS online test and questionnaire functions were used to collect data and conduct analysis and evaluation. Support for the participants during this period was provided by utilizing email and the JICA-VAN community feature. The prototype contents were created in the SCORM format and placed on the LMS, and verification was also implemented on the merits and demerits of converting to SCORM format. Moreover, cost effectiveness was verified concerning the demonstration contents.

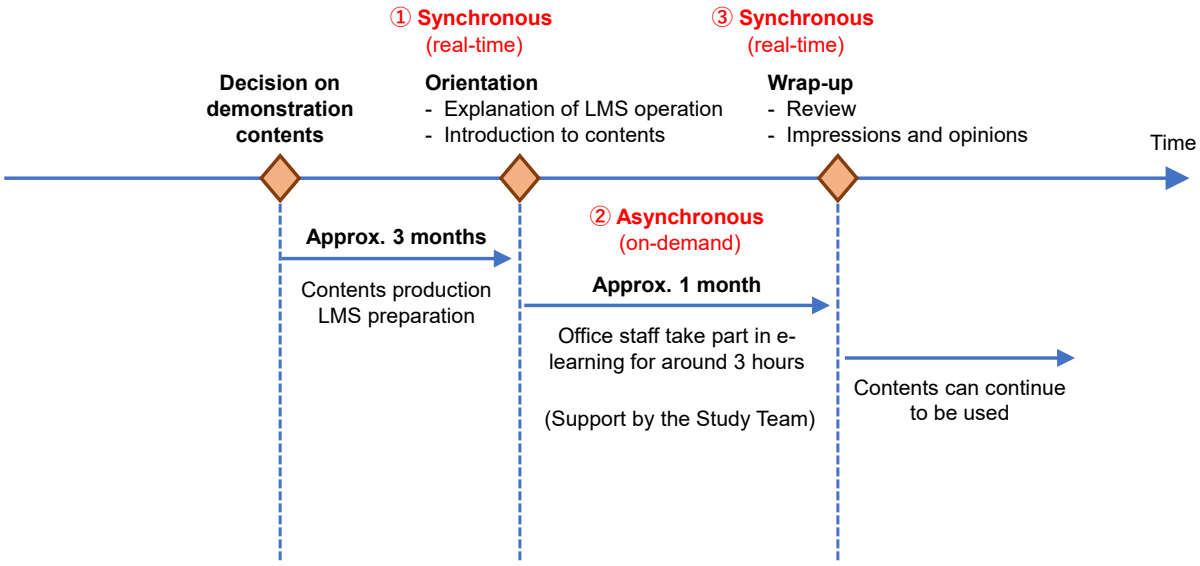


Figure-55 Demonstration Survey (PoC) Flow

The following table indicates this 3-step process and methods of Demonstration Survey (PoC) implementation.

Table-44 Outline and Implementation Methods (Draft) of the Demonstration Survey (PoC)

Outline of Survey	Implementation Method
1. Orientation (October 21, 2021) A real-time session comprising explanation of the demonstration contents and LMS operating method was implemented.	・ The Study Team members acted as facilitators and implemented using Zoom (about 60 minutes).
2. E-learning (October 21-November 18) Staff of JICA Overseas Offices implemented on-demand online learning of the e-learning teaching materials on LMS.	・ Prototype e-learning teaching materials for around 3 hours of study time were created, and learning was implemented for approximately 4 weeks using LMS and YouTube. ・ The LMS report and online questionnaire results were analyzed.
3. Wrap-up (November 18, 2021) A real-time session was implemented to review the online learning and exchange impressions and opinions.	・ The Study Team members acted as facilitators and implemented using Zoom (about 60 minutes).

The following table shows the composition of the prototype contents. The contents were created so that the envisaged learning time would be approximately 30 minutes per unit, meaning that the total learning time in 5 units would be between 2.5-3 hours. As for the video teaching materials, concerning the theory-based materials, PowerPoint slides and a service known as Amazon Polly[21], which utilizes AI to convert sentences to audio, were used to create audio files and convert them into video format. Concerning the drill-based materials, videos showing PC operating screens were created together with audio files similarly made using Amazon Polly, and a video editing tool was used to synthesize the video and audio files. In each of the contents, sample files for use in drills, and reference information, etc. were placed as learning resources in the contents. In each module, quizzes based on multiple-choice problems, etc. were placed to allow confirmation of the learning contents. Concerning the online questionnaire, preliminary questions about the contents were placed before the lessons, while impressions of the contents were placed afterwards.

Table-45 Composition of Prototype Contents and Teaching Materials (Per Unit of Contents)

Type of Teaching Materials	Contents of Teaching Materials	Envisaged Study Time
Video teaching materials (theory-based)	Video of PowerPoint slides with audio (using an automatic audio conversion service)	Approx. 10 mins
Video teaching materials (drill-based)	Video with audio commentary capturing a PC screen (using an automatic audio conversion service)	Approx. 10 mins
Learning resources	Sample files, reference information, etc. for use in drills	
Before and after tests	Around 5 multiple-choice questions, etc. in each module	Approx. 5 mins
Questionnaire (Before and after the learning)	Around 10 multiple-choice and free-form questions	Approx. 5 mins
	Total	Approx. 30 mins

[21] Service for converting sentences into audio. https://aws.amazon.com/jp/polly/

Concerning the prototype contents, based on the feedback from the Progress Report 2 report meeting and findings of the IT literacy questionnaire, contents were created on the following 5 highly requested themes under the title of "Course in IT Skill Improvement for International Cooperation Project/Activity Sites".

- IT Skill Improvement for International Cooperation Project/ Activity Sites (Introduction)

  These contents introduced the following 3 components of IT literacy: ① information literacy, ② computer literacy, and ③ network literacy.

- Windows 10 bits of knowledge

  Contents for introducing bits of knowledge and tips that are useful for improving the efficiency of work, and reference cases concerning general methods for operating and setting Windows 10

- Improving Excel skills

  Contents that use reference cases of Excel in work to introduce techniques for creating easy-to-understand tables, improve efficiency of data inputting, improve the efficiency of spreadsheet operations and totaling work, etc., and utilize pivot tables, etc.

- LMS introduction

  Contents for introducing basic knowledge for persons who have never used LMS and persons who want to know what kind of system LMS is, and reference cases particularly from the viewpoint of training lecturers and persons creating teaching materials.

- Latest IT trends

  Contents for introducing the latest IT trends concerning AI, IoT, cloud, big data, etc. and reference cases showing how to apply IT to actual work. Here, the contents focused especially on smart manufacturing based on IoT.

For each of the contents, creating a digest version entails reducing the content, however, it was possible to create prototype contents according to various patterns and investigate what type of contents were effective for improving skills. Moreover, concerning Windows10 and Excel operating drills, etc., since numerous literature and online resources are already available without having to create new prototype contents, contents were created for introducing reference cases that are useful for the work of JICA Overseas Offices. The following table shows the prototype contents. Consideration was given to the ease of learning by making independent modules and specifying the targets and IT skill levels in each. The first module comprised introductory contents introducing the overall outline of IT skills and level required for the work.

Table-46 Composition of Modules in the Course in IT Skill Improvement for International Cooperation Project/Activity Sites

Module	Topics	Composition of Contents			Target Trainees
		Video	Quiz	questionnaire	
1. Introduction	Introduction to IT skills and level necessary for work (Introduction to IT literacy)	20 mins	4 Qs	10 Qs	[General contents] Persons who want to know what kind of IT skills and level are needed for work
2. Windows bits of knowledge	Reference cases on operating and setting methods for improving work efficiency	15 mins	4 Qs	10 Qs	[General contents] Persons who use Windows in work
3. Excel skill improvement	Introduction to training management tables, cross tabulation and pivot tables	35 mins	4 Qs	10 Qs	[General contents] Persons who use Excel in work
4. LMS introduction	Introduction to LMS as seen by lecturers (introduction to contents creation)	25 mins	4 Qs	10 Qs	[Some technical terms included] Persons who want to know about LMS
5. IT latest trends	Introduction to IoT and examples of introduction (smart manufacturing based on IoT)	30 mins	4 Qs	10 Qs	[Some technical terms included] Persons who want to know about AI and IoT

Concerning the definition of IT literacy, for example, the Information-technology Promotion Agency (IPA) in Japan provides an IT literacy standard (ITLS)[22]. According to the ITLS, IT literacy is defined as "knowledge, skills and utilization capacity for correctly understanding events, information, etc. in the IT field in society, communicating with stakeholders, and efficiently and effectively utilizing and promoting work, etc." Moreover, as is shown in the following table, there are numerous qualification systems related to IT literacy both in Japan and the rest of the world. In the evaluation questionnaire implemented here, questions were included concerning experience of such qualification system examinations, possession of qualifications and degree of recognition and dissemination in Project/ Activity site countries with a view to also demonstrating the IT literacy level of JICA Overseas Offices staff and surveying qualifications, etc. that can be recommended in the future.

[22] Information-technology Promotion Agency, IT literacy, https://www.ipa.go.jp/jinzai/itss/itls.html

Table-47 Examples of IT Literacy Qualification Systems

Qualification	Outline	Main Contents
ICDL (International Computer Driving License) https://icdl.org	A computer literacy examination program provided by the ECDL Foundation, an NPO in Europe. There are more than 20,000 certified qualification agencies in 100 countries throughout the world, and so far 50 million people have taken examinations.	There are 5 categories. ICDL Workforce is a qualification for businesspersons that covers from computer app operation to the basics of network and information security and good practices. In Latin America and the Caribbean, there are numerous test centers in Mexico (16 locations) and Colombia (22 locations).
IC3 (Internet and Computing Core Certification) https://ic3.odyssey-com.co.jp/	This is an international qualification for comprehensively demonstrating basic knowledge and skills related to computers and the internet. It is implemented in 19 languages in 78 countries, and so far 5 million people have taken examinations.	The test is composed of 3 subjects: "Computing Fundamentals", "Key Applications", and "Living Online".
The LAC (Literacy Assessment Center) Academy Digital Literacy test https://www.digitalliteracyassessment.org/	This test defines the basic skills necessary for using computers and internet in advanced education and work.	The test is composed of 3 subjects: "Essential Computer Skills", "Essential Software Skills", and "Using Technology in Daily Life".
Microsoft Office Specialist (MOS) https://mos.odyssey-com.co.jp/index.html	This qualification geared to enabling practice of the basic operations and applied operations of Microsoft Office has been taken by 4.5 million people.	There are beginners' and advanced examinations according to each app such as Word, Excel, PowerPoint, etc.
Information Processing Engineer Examination https://www.jitec.ipa.go.jp/	This is a national examination for helping improve the skills of persons involved in information processing work, and it is implemented as a common examination in various countries in Asia.	As examinations for persons who use IT, there is the IT Passport examination (more than 1 million examinees so far) and the Information Security Management Examination.

Judging from the contents of ITLS and these qualification systems, the IT literacy that is required in work by general business persons is often divided into the following categories: ① Information literacy necessary for collecting, managing and analyzing information, etc., ② Computer literacy related to basic operation of computers and software for office tools, etc., and ③ Network literacy related to the ability to understand technical knowledge related to network security and morals pertaining to correct use of the internet and so on.

Table-48 General Categories of IT Literacy

Types of IT Literacy	Main Contents
① Information literacy	3 abilities: “Ability to search for information”, “Ability to scrutinize information” and “Ability to use information”.
② Computer literacy	Computer operating technology or knowledge. The ability to use Office apps such as Word, Excel and PowerPoint
③ Network literacy	The ability to understand technical knowledge related to networks and security. This also includes correct use of the internet and morals in using the internet.

When creating on-demand-type e-learning teaching materials (contents) for each of these IT literacy categories, as is shown in the following table, types of contents that were suited to each category were created.

Table-49 Definition of IT Literacy Used in this Demonstration Survey (PoC)

Classification of e-learning teaching materials	Outline of e-learning teaching materials	Suitable IT literacy category
① Lecture-type (knowledge-based)	Mainly comprising theoretical lecture videos and tests for checking understanding	① Information basic literacy ③ Network literacy (information security management, etc.)
② Drill-type (skill-based)	Mainly comprising drill-centered lecture videos and actual implementation of sample drills based on actually operating computers	② Computer literacy ③ Network literacy (how to use the internet, etc.)

The prototype contents were created as a Japanese version and a Spanish version. Accordingly, a total of 10 contents were created for the 5 modules (Japanese and Spanish for each).

The prototype contents were prepared so that the trainees could use in 2 ways as follows: ① Placing of SCORM contents on the LMS and, assuming cases where trainees cannot access JICA-VAN due to internet environment, etc., ② converting the contents into videos and placing them on limited release on YouTube.

Table-50 Prototype Contents Distribution Method

Distribution Method	Contents	Remarks
① LMS JICA-VAN	Distribution as SCORM-format contents	As the version of SCORM, the 2004 3rd Edition was set.
② Video distribution YouTube	Distribution as videos on limited release on YouTube	For the YouTube videos, the “time stamp” feature was used so that videos started from specified times with links to the table of contents attached for each chapter. The video files were compressed on FFMPEG[23] using CRF[24] of 23.

[23] FFMPEG is a free tool for recording, converting and playing videos and audio.
[24] CRF (Constant Rate Factor) is the quality adjustment value when encoding videos. On FFMPEG, 23 is the specified value.

The following table shows the respective capacity of the prototype contents that were created by the methods shown above.

Table-51 Capacity of Prototype Contents

Contents	Video Play Time	SCORM Size	YouTube Video Size
1. Introduction	20 mins	Approx. 18MB	Approx. 40 MB
2. Windows bits of knowledge	15 mins	Approx. 20 MB	Approx. 35 MB
3. Excel skill improvement	35 mins	Approx. 55 MB	Approx. 120 MB
4. LMS introduction	25 mins	Approx. 36 MB	Approx. 70 MB
5. IT latest trends	30 mins	Approx. 35 MB	Approx. 90 MB

(2) Demonstration Survey (PoC) targets

Rather than targeting specific Projects/ Activities, this survey was implemented for staff who wish to participate without adding to their regular work burden in all the JICA Overseas Offices located in the target areas.

(3) Demonstration Survey (PoC) implementation contents and schedule

The following 2 tables show the detailed implementation contents and schedule of the Demonstration Survey (PoC).

Table-52 Demonstration Survey (PoC) Implementation Contents

Survey procedure	Implemented Contents
1. Selection of JICA Overseas Offices participating in the Demonstration Survey (PoC)	The JICA Overseas Offices were requested to participated in the Demonstration Survey (PoC), and consent to participate was obtained from all.
2. Design of the demonstration LMS curriculum	Based on the findings of the preliminary questionnaire and feedback from the Progress Report 2 report meeting, a 5-module curriculum was designed under the title of "Course in IT Skill Improvement for International Cooperation Project/ Activity Sites".
3. Development of prototype online contents	The authoring tool iSpring Suite Max was procured and used to develop the prototype contents (5 modules, 2 languages).
4. Placement of contents on the LMS and preparation for implementation	① The completed 10contents (5 modules, 2 languages) were converted to SCORM format and placed on JICA-VAN. ② 55 user IDs were created on JICA-VAN for stakeholders and survey participants, and the 10 learning contents were allocated to all 55 user IDs. ③ On JICA-VAN, a community comprising these 55 users was created under the title of "Pilot study: JICA Latin America Community", enabling the stakeholders and survey participants to use the community feature.
5. Implementation of e-learning based on the LMS	① Orientation was staged (October 21, 2021). In this, explanations were given on the outline of the survey and methods of use of contents, etc. ② The e-learning was implemented. (On-demand learning on JICA-VAN and video distribution on YouTube) ③ During the e-learning implementation, questions from the survey participants were responded to and support was provided for users who were having difficulty logging in and so on. ④ During the e-learning implementation, the JICA-VAN access logs were monitored and follow-up was conducted for participants not engaged in learning. ⑤ A wrap-up meeting was staged (November 18, 2021). In this, the Demonstration Survey (PoC) was reviewed and feedback was obtained from the participants.

Survey procedure	Implemented Contents
6. Feedback from stakeholders, evaluation and analysis	① The following data analysis was implemented concerning the Demonstration Survey (PoC). ✓ Analysis of the results of an online questionnaire on the contents ✓ Analysis of the JICA-VAN reports ✓ Analysis of the YouTube access logs ✓ Analysis of the feedback obtained from the participants in the wrap-up meeting ✓ Analysis of the final questionnaire results ② From the results of the above data analysis, the evaluation results were compiled and ways in which the demonstration contents can be utilized in Projects/Activities in Latin America and the Caribbean were summarized.

Table-53 Demonstration Survey (PoC) Schedule

Survey procedure	Period	Schedule (2021)				
		8	9	10	11	12
1. Selection of JICA Overseas Offices participating in the Demonstration Survey (PoC)	2weeks					
2. Design of the demonstration LMS curriculum	4weeks					
3. Development of prototype online contents	8weeks					
4. Placement of contents on the LMS and preparation for implementation	4weeks					
5. Implementation of e-learning based on the LMS	4weeks					
6. Feedback from stakeholders, evaluation and analysis	2weeks					

PLAN Performance

(4) Equipment and tools used in the Demonstration Survey (PoC)

The following table shows the equipment and tools used in the Demonstration Survey (PoC).

Table-54 Equipment and Tools used in the Demonstration Survey (PoC)

Classification	Equipment and Tools	Remarks
Contents creation	Authoring tool iSpring Suite Max	Upon procuring an annual subscription license, it was used to develop SCORM-format contents. (August 11, 2021-August 11, 2022)
LMS	JICA-VAN	10contents were placed on JICA-VAN and used upon allocating a total of 55 user IDs to stakeholders (7 users) and participants (48 users).

The following figure shows a sample screen on the LMS of the SCORM-format contents created using the authoring tool and the operating method common to the contents.

Figure-56 SCORM-format Contents Sample Screen and Operating Method

(5) Evaluation of the Demonstration Survey (PoC)

① Summary of the data analysis results (data analysis concerning contents and JICA-VAN)

In this Demonstration Survey (PoC), the results of data analysis based on the access histories of JICA Overseas Office staff and 48 users registered with JICA-VAN and findings of questionnaires are outlined below. The detailed analysis results are stated in Appendix “Demonstration Survey (PoC) 4 Detailed Data Analysis Results (data analysis linked to contents and JICA-VAN)”.

- Contents were provided in 2 ways, namely through JICA-VAN and through YouTube, however, in the Demonstration Survey (PoC), most of the participants used JICA-VAN. YouTube contents were provided assuming cases of poor internet environment, however, according to the comments, some participants took the lessons on JICA-VAN and then followed them up by taking them on YouTube too.

- Concerning the access environment, which raised concern at the beginning, no particular problems were experienced because the training was implemented after first taking countermeasures such as compressing the video contents as much as possible.

- Because the training time for Excel was roughly two times longer than for the other modules , it is surmised that the participants are highly interested in improving their Office app skills

- Concerning operability of JICA-VAN, many questionnaire responses indicated that it is easy to use, and it was also found that the participants who said it was easy to use tended to spend longer time on the training.

- Generally speaking, the overall response from participants was that the contents were useful to an extent and not that difficult.

・ Less than half of the participants said that they didn't use the JICA-VAN community feature. Most said they didn't use it, saying that they couldn't confirm whether there had been any new posts, they were too busy to use it, or they had no questions to ask and so on.

Below are indicated some examples of the analysis findings. The following figure shows the results, compared between before and after the PoC (before and after the participants received training in the contents), in response to the questionnaire about what kind of contents would be required in the case of future full-scale creation of contents. See the analysis column for the key points.

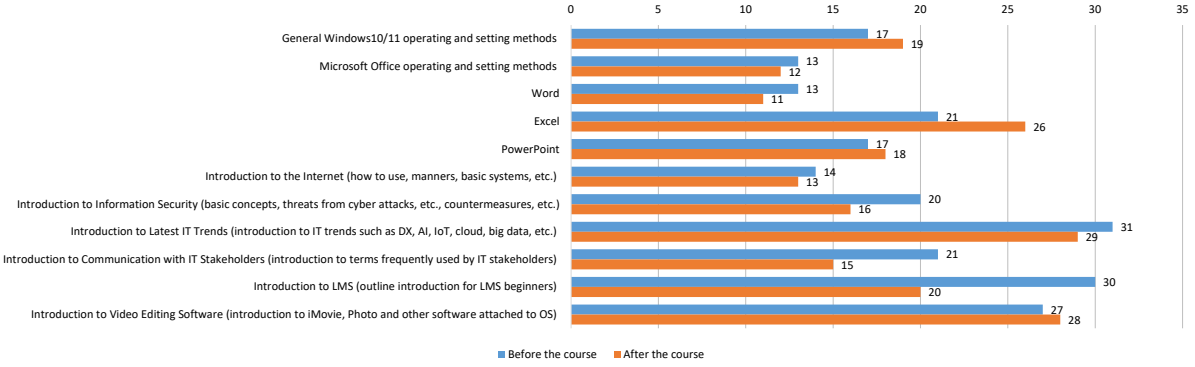


Figure-57 Contents the Participants Want to Learn in Future
(Comparison between Before and After the Training)

Analysis

- The number of participants who want to learn Excel increased compared to before the training (from 21 to 26 responses).
- The number of participants who stated a preference for the latest IT trends was highest both before and after the training.
- The number of participants who stated a preference for LMS decreased (from 30 to 20 responses), however, since a lot of the participants indicated a desire to learn video editing tools, it is surmised that many staff members want to learn about how to create video contents.
- Concerning comments about Excel, many participants indicated a desire to improve skills regarding full-scale utilization of data analysis tools such as functions, macro, VBA, pivot tables, Power BI, etc.

The following table shows responses to the question about what is required for further improvement of IT literacy in future, and results concerning the total number of hours spent by the participants receiving training on JICA-VAN in respect to each answer. See the analysis column for the key points.

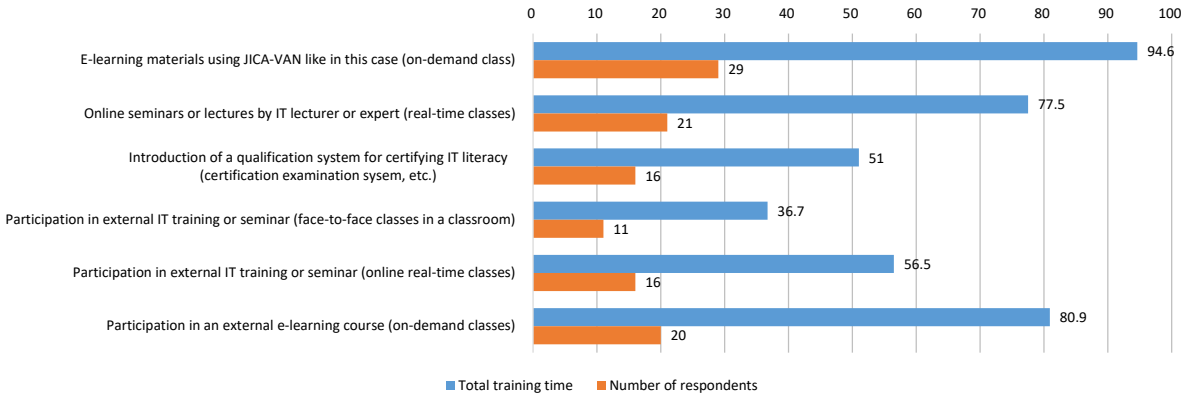


Figure-58 Things Deemed Necessary for Future Improvement of IT Literacy, and Total Training Time on JICA-VAN of Respondents

Analysis

- In terms of the number of respondents, many of the participants answered that e-learning on JICA-VAN is necessary (29 persons).
- In terms of the total training time too, the participants who answered that e-learning on JICA-VAN is necessary spent a long time on training (94.6 hours)
- It is surmised that there is a trend where participants who used JICA-VAN for a long time also wish to conduct e-learning on JICA-VAN in future.

② Summary of data analysis results (data analysis concerning It literacy of staff in JICA Overseas Offices)

The following paragraphs describe the results of analysis in the questionnaire survey related to the IT literacy of staff in JICA Overseas Offices. The first question, aimed at indirectly diagnosing the level of IT literacy, asked how staff usually respond when they encounter PC operating difficulties in the workplace. See the analysis column for the key points.

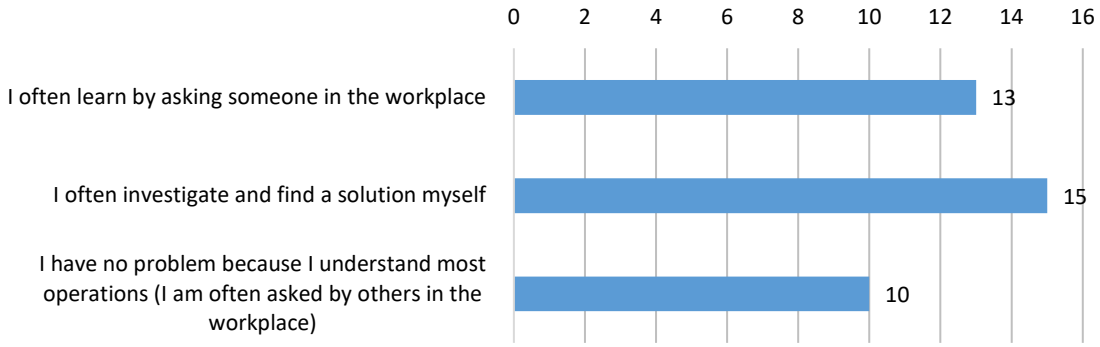


Figure-59 How do you normally respond when you encounter PC operating difficulties in the workplace?

Analysis

- The intention was to try categorizing staff members based on their own judgment of IT skill level into: 1) beginners, who require assistance from others, 2) intermediate level users, who can resolve problems by themselves, and 3) advanced level users, who can assist persons having difficulties.
- As is shown in the figure, there was no major disparity in the projected number of people in each category but rather a good balance, however, it also needs to be considered that most of the participants were staff members who wanted to take part and thus had a high degree of interest in ICT.

Next, responses to the online questionnaire concerning information security management are described. First, in response to the question asking whether staff had a grasp of rules and guidelines related to workplace information security, the following results were obtained. See the analysis column for the key points.

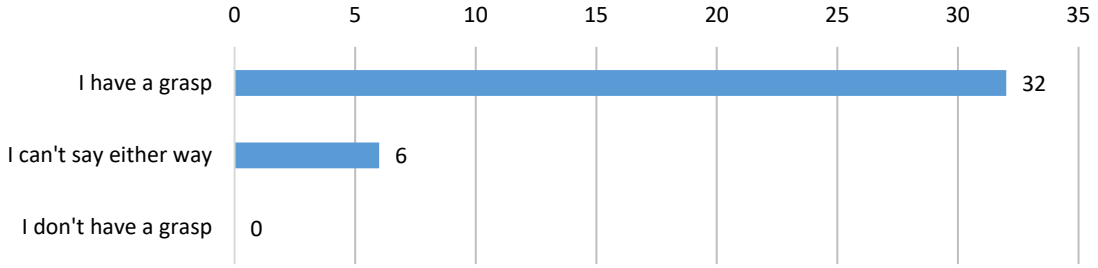


Figure-60 Do you have a grasp of rules and guidelines related to workplace information security?

Analysis

- As is indicated in the figure, approximately 85% of participants responded that they did have a grasp of rules and guidelines related to workplace information security.
- Since nobody responded that they didn't have a grasp, although responses were based on self-declarations, these results suggest that staff in JICA Overseas Offices have an adequate grasp of the importance of workplace information security management.

Moreover, in response to the question asking how staff mainly manage the IDs and passwords they normally use in the workplace, the following results were obtained. See the analysis column for the key points.

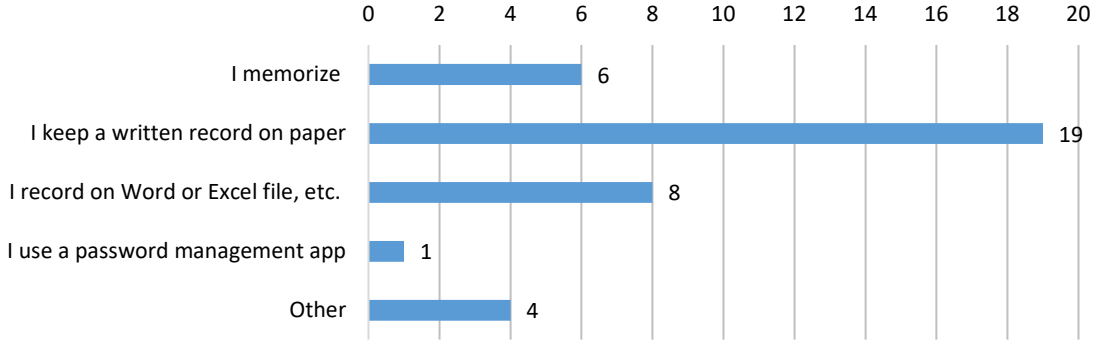


Figure-61 How do you mainly manage the IDs and passwords you normally use in the workplace?

Analysis	・As is indicated in the figure, it was found that only 1 person uses a password management app, while approximately 60% of participants said that they manage passwords by non-digital methods such as memorizing or writing down on paper.

Finally, in response to the question asking whether staff would want to acquire a qualification to certify IT literacy in the workplace if such a qualification existed, the following results were obtained. See the analysis column for the key points.

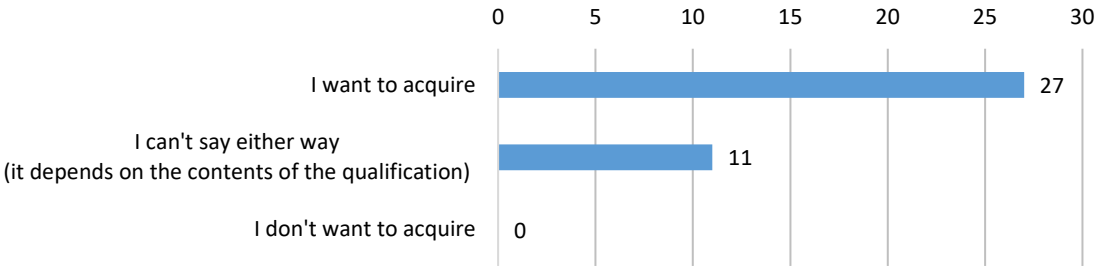


Figure-62 Would you want to acquire a qualification to certify IT literacy in the workplace, if such a qualification existed?

Analysis	・Approximately 70% or more of the participants said they would want to acquire a qualification to certify IT literacy, while all the participants responded positively to the idea of a qualification system. Accordingly, it was confirmed that staff members hope for the introduction of a qualification system related to IT literacy.

From the above results, it can be confirmed that the time spent learning contents on JICA-VAN was longer among trainees who indicated that they find JICA-VAN to be easy to operate, and that most of the participants indicated a desire for on-demand contents on JICA-VAN as the thing most necessary for improving IT literacy. Therefore, there has been revealed to be a high possibility that the full-scale implementation of e-learning by on-demand teaching materials utilizing a system such as JICA-VAN will be effective for improving the IT literacy of staff in JICA Overseas Offices. Moreover, judging from the voices of staff on offices, there is surmised to be much interest in IT literacy, especially computer literacy, and more specifically, improvement of skills centered on Office apps that can be immediately utilized in the workplace.

Concerning questions related to information security management, whereas many participants answered that they had a grasp of rules and guidelines related to workplace information security, many indicated that they manage passwords by memorizing them or writing them on paper, etc. Accordingly, to realize improvement of IT literacy, in addition to improving understanding in terms of knowledge, it is surmised that developing drill-based online teaching material contents that enable staff to practically improve their information security management skills in the workplace will be important.

③ Outputs of demonstration

- Based on the results of the questionnaire of participants and analysis of the JICA-VAN access log, apart from the staff members who were too busy to participate, it was confirmed that participants spent longer time engaged in on-demand learning than they originally intended. This indicates that JICA-VAN was fully utilized in this Demonstration Survey (PoC).
- Concerning internet access to JICA-VAN, assuming locations with poor internet environment, an alternative means of access was provided via YouTube videos, however, all locations were able to participate in the survey, and the program completion rate was high even in Venezuela and other locations where it was assumed from the preliminary ICT environment survey that difficulties would arise. Accordingly, the problem of being unable to conduct online learning due to inadequate internet connection bandwidth was not observed.
- Concerning the relation between the questionnaire responses and conditions of LMS use by participants, for example, persons who spent longer time accessing JICA-VAN found it to be easy to operate and also used the community function more, this can also be confirmed from the data analysis results. It also is confirmed that ease of operating JICA-VAN from the viewpoint of learners is linked to a higher learning effect.
- Concerning the ease of operating JICA-VAN from the viewpoint of training managers, it was confirmed that management operations on JICA-VAN are easy when creating SCORM-format contents using the authoring tool, etc. that was utilized in this Demonstration Survey (PoC). This is because SCORM is convenient in that it is possible to develop all items including videos and quizzes, etc. inside the contents, upload the completed SCORM files to JICA-VAN, and simply set the learning allocation to prepare the contents for use.

④ Issues in implementation

The following table indicates the issues that were encountered in implementing this Demonstration Survey (PoC), especially concerning use of the LMS and development of contents, and proposed improvements for developing contents for improving IT literacy in earnest from now on.

Table-55 Issues and Improvements Encountered in the Demonstration Survey (PoC)

Category	Issues	Improvements
LMS	Response if passwords are forgotten Participants clicked on "I Forgot Password" by mistake.	The following are recommended: ① Thorough participation in preliminary training in JICA-VAN operations, ② Provision of FAQs in cases where there are numerous examples, ③ Examination of information sharing and support, etc. utilizing the community feature.
LMS	Encouragement to use the community feature There were only a few users.	The following are recommended: ① It would be convenient if it were possible to determine whether there are new posts from the top page for learners. ②Before the training, provide explanations on using the community and using mail, etc., ③ Utilizing the notification feature when posting messages, examine revising settings so that appropriate notifications go to the necessary targets.
LMS contents	Visualization of contents learning progress It's hard understanding the timing of when the contents learning status changes from "Active" to "Finished."	Develop SCORM-format contents with a shorter learning time. Develop contents divided into module units so that they can be learned in a short time.
LMS contents	Contents time-out time (1 hour) The session runs out of time during learning of contents. Maybe this is because the SCORM-format contents are opened on a separate browser at the start but the server session is managed on the browser on the host side (?).	Develop SCORM-format contents with a shorter learning time. Develop contents divided into module units so that they can be learned in a short time.
Contents	Feature for changing the play speed of contents videos Many participants want to view videos in faster speed. The current version of the authoring tool has no feature for changing the play speed, and it is not possible to use the speed change tool, etc. based on the browser extension feature from SCORM.	Use SCORM-format contents in tandem with YouTube videos. Trainees who want to fast-forward videos can watch on YouTube.
Contents	Utilization of learning resources Attached files can be posted inside contents using the SCORM feature, however, participants couldn't effectively utilize them.	Making contents into PDF files for use as learning resources would be convenient because they could be downloaded as reference materials. Also, insert YouTube video links into the PDF files.

⑤ Evaluation of Demonstration Survey (PoC) cost performance

Concerning evaluation of the Demonstration Survey (PoC) cost performance, the following table indicates the results of analysis based on inputs and effects obtained from demonstration.

Table-56 Cost Performance Analysis (Inputs and Effects)

Inputs	Effects	Cost performance
Contents development software (Authoring tool for converting PowerPoint slides into contents) iSpring Suite Max Annual subscription: 154,660 yen	This was used for developing SCORM-format contents.	Since this is a PowerPoint add-on tool, it is easy to use even for first-timers. It was used for creating all the contents.
Contents development cost (recruitment of expert) No. 3 approximately 1 person-month: Analysis, design, development No. 5 approximately 1 person-month: Development (redesign)	For total learning time of approximately 3 hours, 5 modules of contents were developed in 2 languages.	Development was completed through the expert person-months only without having to subcontract.
Contents development cost (audio recording) Development conducted within the bounds of free service	All audio contents were generated in 2 languages.	From the results of the questionnaire, some improvements were pointed out regarding pronunciation and sound quality, however, overall, contents of a learnable level were created.
Cost of translating contents into Spanish: approximately $5,000	All slides and script were translated into Spanish.	The questionnaire results concerning contents in Spanish were generally good. There was also no problem with the preliminary check by Native speakers.
LMS (JICA-VAN) operating cost Study Team members placed and operated the contents	55 user IDs were issued and used without a problem for approximately 1 month.	LMS operation was conducted based on only the expert person-months, without having to subcontract.
User support cost Study Team members provided support	The necessary support was provided to the PoC participants.	The necessary user support was implemented without having to subcontract the service.

Concerning the cost of developing the contents in this Demonstration Survey (PoC), it is difficult to make an accurate cost calculation here because materials were internally produced by the Study Team, however, the rough total cost is estimated at approximately 6,000,000 yen based on, ① charges for using contents development software, ② direct personnel expenses of contents development (unit rate of remuneration in consulting contracts), and ③ cost of Spanish translation. In the Demonstration Survey (PoC), contents for approximately 3 hours of learning time were developed, which means that the unit development cost was 2,000,000 yen. Since there were approximately 50 participants in the Demonstration Survey (PoC), the learning rate per person per hour is approximately 40,000 yen, however, since this rate decreases in proportion to the number of users, it is likely to decrease further. For example, assuming that the majority of staff in JICA Overseas Offices in Latin America (here, estimated to be approximately 200-300 people) receive training, the unit rate would drop to around one-fifth to approximately 8,000 yen, and it would drop even further if the contents were used over multiple years for training of new recruits and newly assigned staff and so on. In this way, it is important to estimate the envisaged number of online learners as accurately as possible when planning contents development.

(6) How to leverage in projects/Activities in Latin America

① Points clarified in summarization of the Demonstration Survey (PoC) data analysis

From summarization of the Demonstration Survey (PoC) data analysis, the following conditions were revealed concerning the IT literacy of staff in JICA Overseas Offices.

- From the perspective of users, considering that participant trainees here were able to enthusiastically receive training for a long time despite being busy with their own work, JICA-VAN is an easy to use LMS the staff members of JICA Overseas Offices in Latin America and the Caribbean. Moreover, since no problems were experienced concerning the internet connection environment at any of the Overseas Offices, it is thought to be an ideal platform for improving IT skills.
- Concerning Excel contents, characteristic features were observed in the results of the data analysis. In other words, the training time was longer than for other contents, and the ratio of participants expressing a preference for it increased further after the training. Possible reasons are that the participants are highly interested because they have a lot of spreadsheet and data processing tasks in their regular work, and that the inclusion of drills in the contents encouraged the participants to perform practical work and take an interest in hands-on contents and so on. In addition, since the participants understand the importance of efficient data management and data analysis in their regular work, it is thought that they are interested in improving their skills in this field. Since Excel accounts for around 30% of overall work time, it is thought to be an important Office app for improving IT skills.
- Interest in the latest IT trends and new technologies was high in the results of questionnaires conducted both before and after the training; hence, there is surmised to be a high level of interest in the latest ICT and DX.
- Judging from the results of the data analysis, it is surmised that many of the participants in the Demonstration Survey (PoC) are endowed with sufficient IT literacy to implement work. For example, the results showed that two-thirds of the participants found the contents easy or useful, i.e. they could understand the contents, and they can resolve PC operating problems themselves and help other people in the workplace. Moreover, since the participants grasp workplace security rules and are positive about acquiring qualifications for certifying IT literacy, it is surmised that there is a high level of interest in improving IT skills.

② Staff in JICA Overseas Offices

In future, it is recommended that JICA-VAN continue to be used, for example, in the following kinds of initiatives. This is a bottom-up approach starting from Project/Activity sites.

- Communities should continue to be vitalized. For example, when communities include central users, they have a better possibility of being successful. For example, consideration should be

given to the idea of assigning users who regularly post messages or actively transmit information. Another idea would be to establish a community operating team. Also, consideration should be given to differentiating from other communication tools such as Teams, etc., for example, the JICA-VAN community should focus on improvement of IT skills or other methods for creating an environment that is easy to participate in. Moreover, concerning utilization of communities, as development activities, volunteers in the Latin America and the Caribbean Department have set up a Teams chat group for staff of JICA Overseas Offices, and a group has been established to operate a Teams study group. Furthermore, the Governance Department JICA-VAN team has reported that linkage between LMS and Teams will play an important role in disseminating LMS from now on. In future, it is recommended that such initiatives to improve IT literacy based on synergy between on-demand learning and communication tools be conducted.

- Consideration should also be given to starting small and creating original easy contents for improving IT skills (staff in JICA Overseas Offices can create easy contents for their own communities). For example, since sets of teaching materials comprising literature and YouTube videos are recently becoming popular, simple contents for introducing such contents could be created. Moreover, since there are now numerous general learning resources related to Windows and Excel, consideration should be given to utilizing such contents.
- Staff should make it a habit to periodically login to JICA-VAN. For example, since JICA-VAN already contains numerous contents including those in Spanish, it is recommended that such contents be introduced in communities with a view to building an environment where staff in JICA Overseas Offices can actively login.

③ Utilization in other JICA Projects/Activities

In future, consideration should be given to developing on-demand contents related to improving IT skills in earnest. To such an end, it is first necessary to set the overall level of contents and design the structure of contents. Since the data analysis results here indicated that there is a particularly high degree of interest in Excel, and enhancing data science capability is also important in terms of improving IT skills, consideration should be given to creating a module among the contents in which Excel is used as a data analysis tool out of tabulation apps. To improve data science capability, it is necessary to improve skills with a good balance in terms of theory, i.e. understanding information systems, and practice, i.e. improving skills that can be immediately used in work; in addition, it is important to enhance the motivation to learn of trainees by incorporating applied drills developed from cases in ODA sites into the contents. Through developing contents that integrate these three elements, the aim is to enable users to independently analyze the data they possess. In particular, the latest Excel is becoming highly functional and it is even possible to develop simple database apps using Excel alone. Moreover, a recent mainstream trend of DX is that users can independently develop apps through non-programming or minimum programming,

and it is even said that users in future will be able to conduct high-speed and flexible app developments and improvements without having to outsource system development to subcontractors. To keep pace with these trends in digitization, consideration should be given to building a structure where such contents can be developed and operated on JICA-VAN.

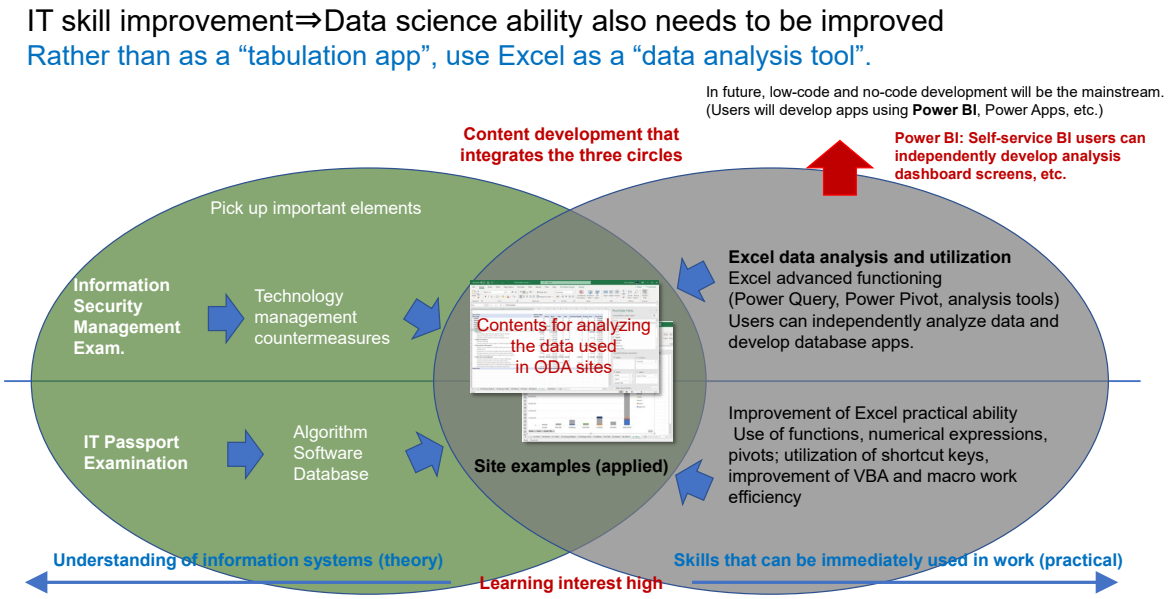


Figure-63 Proposal for Development of Contents Related to Improvement of Data Science Capability

④ Issues

Meanwhile, the following kinds of issues have become apparent.

- Since the staff in JICA Overseas Offices are always very busy and have little time for improving IT skills, it is necessary to consider not only learning that entails written tests but also systems that include drills so that skills can be improved efficiently.
- Whereas staff in JICA Overseas Offices seek practical contents that they “can use immediately” in workplaces, it is also important to consider improvement of IT literacy that includes basic IT knowledge such as information systems, information security, manners, and etiquette. For example, consideration should also be given to developing contents that integrate an examination for information processing engineers, immediately practical skills, and case studies that can be usefully applied on sites.
- It is surmised that there are large individual disparities between staff in JICA Overseas Offices in terms of IT skill level and motivation. Moreover, considering senior staff members who are not very well-versed in IT, it is necessary to implement measures to ensure that all members take an interest and are motivated to learn. For example, consideration should also be given to establishing a qualification system, etc. that utilizes digital certificates (open badges, etc.), including issue of digital completion certificates that can be used as individual qualifications for life.

5. Plan for Construction of the Remote Training Implementation Structure

Based on general collating of the issues facing remote implementation of training described in section 2.1, the countermeasures to such issues described in 3.1 and 3.2, and the results of Demonstration Survey (PoC) 1 (4.2) and Demonstration Survey (PoC) 4 (4.5) that were based on the said measures, the following proposals are made concerning plans for establishment of a remote training implementation structure in Latin America and the Caribbean.

5.1 Basic Thinking concerning Remote Training

Remote training should not be regarded as a temporary mode of training in response to the COVID-19 pandemic; rather, it should be treated as a training mode that can be implemented at all times. Moreover, not all training can be replaced with remote training. Concerning individual training courses too, it is not so much a question of choosing between face-to-face and remote; rather, the method indicated in 5.2 should be employed to select between face-to-face and remote according to the contents and form (classroom learning, practical training, inspection, discussion, etc.) of each training component (module and subject). Moreover, in future, it is thought that it will also be possible to plan training based on contents that assume remote implementation from the start.

Based on this, the most flexible mode of all training may be said to be a combination of face-to-face parts and remote parts. As a result of such examination, if all component elements comprise face-to-face training, the result is the same as conventional training in Japan, and if all of the component elements are implemented remotely, the result is the same as the entirely remote training implemented in the COVID-19 pandemic. However, it is likely that most training will comprise a hybrid of face-to-face and remote training.

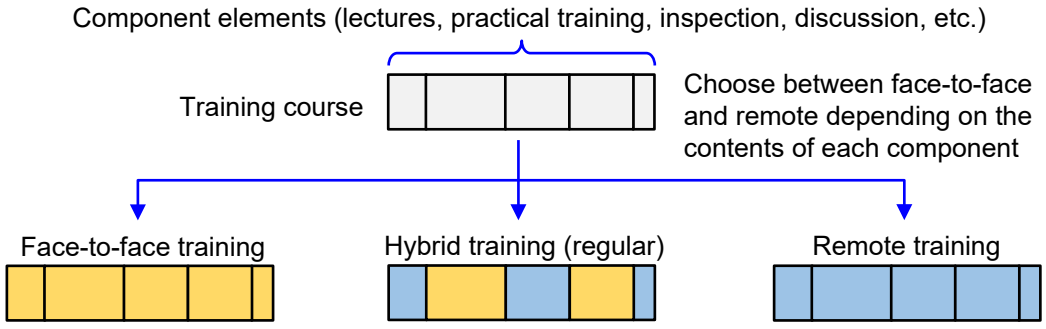


Figure-64 General Mode of Training Freely Combining Face-to-face and Remote

In this case, the following table shows the component elements that can generally be implemented remotely.

Table-57 Component Elements of Training where Remote Implementation is Advantageous (Examples)

Component elements	Description
Training advance briefing	Usually, trainees gather in the JICA Overseas Offices, etc. for briefings, however, such briefings can be abbreviated by conducting online briefings that connect Headquarters or the training implementation agency with each trainee.
Lecture concerning basic information on the training themes	This lecture related to basic knowledge, preconditions and so on pertaining to the training themes, is conducted at the start of the overall training. This does not require travel to Japan for face-to-face implementation, but can be amply handled through remote training and on-demand training via LMS. Moreover, since the same contents can be used in multiple training courses of similar content, it is also possible to produce a video or LMS contents in advance.
Contents with a high potential of reuse	If it is expected that lectures and practical training of the same contents can be reused in multiple training, it is desirable to produce the contents as a video or LMS contents in advance, thereby enabling trainees to conduct private learning without traveling to Japan.
Auxiliary teaching materials	Contents that are intended for the trainees to learn in their own time apart from the main training are suited to video or LMS contents.
Tasks, etc. that should be implemented before departing from one's country	If there are tasks or assignments that trainees need to tackle in their own country before traveling to Japan, rather than simply giving written instructions, it is also effective to remotely explain the implementation methods, etc. and possible to conduct the presentation and sharing of tasks remotely.
Contents that should be implemented simultaneously in Japan and locally	As a new approach that was not seen in conventional training in Japan, this training entails simultaneously conducting training in Japan and the local country. An example of this would be to conduct practical training that entails applying agricultural technologies to a field in Japan and a field in the trainees' country and comparing the results in each field.
Post-training follow-up	Follow-up is usually conducted using email and questionnaires, etc., however it is also possible to conduct remote interviews and prepare LMS contents for brushing up.

5.2 Remote Training Implementation Procedure

When implementing training, as is shown in the following flowchart, it is proposed that the following procedure be adopted upon determining the component elements of the training and whether each element should be implemented face-to-face or remotely. Incidentally, the numbers displayed in white against a black background correspond to the corresponding section numbers that follow.

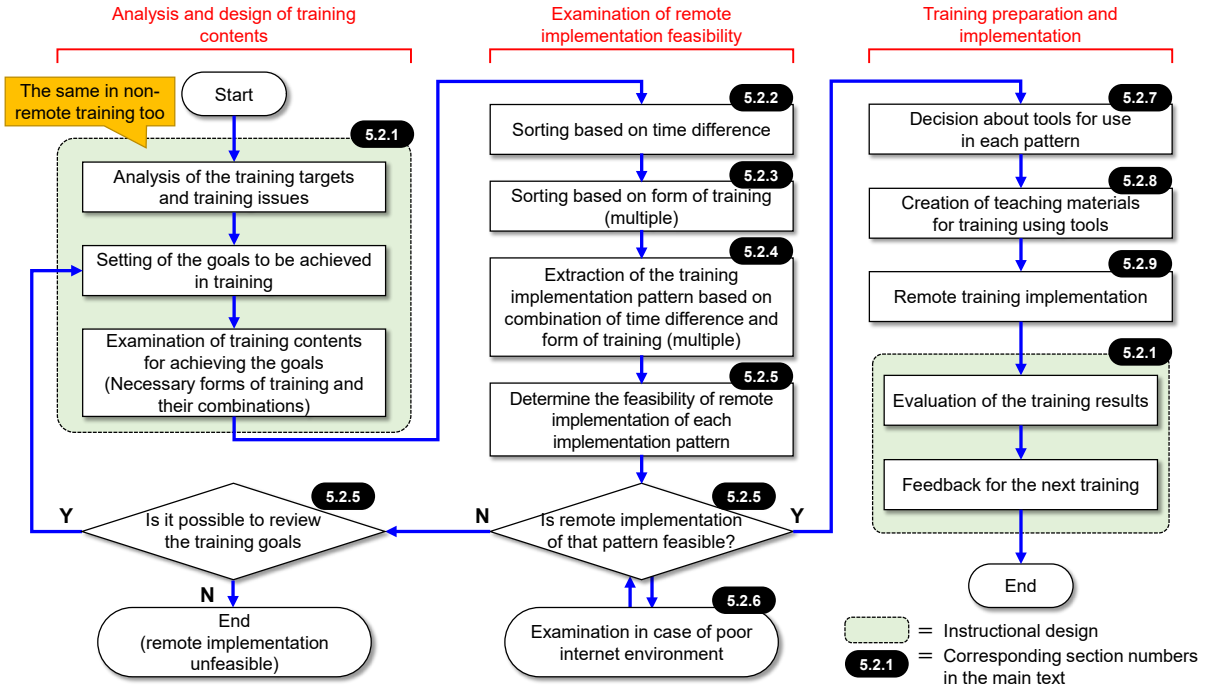


Figure-65 Remote Training Implementation Flowchart

When considering remote training implementation, rather than first deciding the tools that are used in the training, as is shown in Figure-65, first the type of training that should be adopted is decided from the viewpoint of instructional design according to the objectives and anticipated outputs (5.2.1); then cases are sorted according to the viewpoint of "time difference" (5.2.2) and "form of training" (5.1.3), and then the implementation structure that is suited to each case is examined (5.2.4-5.2.6).

5.2.1 Decision of the Training Contents based on Instructional Design

Instructional design is a methodology that begins from analysis of the learning issues and profiling of learners and entails setting the training objectives and outputs that want to be achieved through the training, and then systematically examining "how" contents should be taught to trainees to maximize the said objectives and outputs. This methodology is not especially predicated on the use of ICT and e-learning, but rather is an approach for designing "teaching methods" and "evaluation methods" that can also be widely applied to general training and learning in schools[25]. Specifically, Instructional design adopts a similar approach to PDCA regarding methods for implementing training. As is shown in the

[25] https://www.leapkk.co.jp/2020/04/27/instructional-design/

figure below, the profile and environment etc. of learners are analyzed, design is implemented on the teaching materials and method of teaching for most effectively and efficiently achieving the training objectives and outputs and the method, etc. for evaluating how far the learners have been able to achieve the learning goals, and improvement is carried out upon observing the results of the said work. This cycle is then repeated over and over.

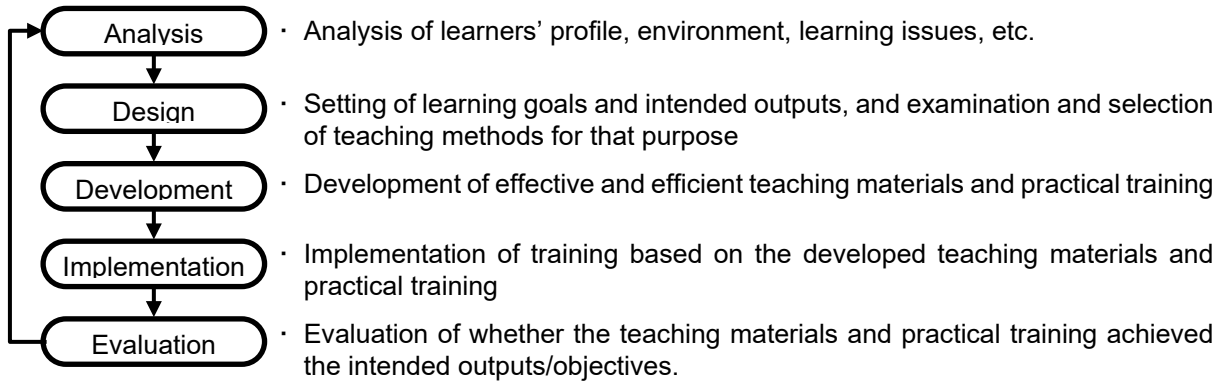


Figure-66 Instructional Design Cycle (ADDIE Model[26])

Instructional design has already been introduced to much of the training that is conducted by JICA, however, a key point of this Study lies in avoiding a situation whereby the goal or precondition of the training becomes simply the utilization of ICT or introduction of the LMS. Rather, emphasis should be placed on the flow whereby, as a result of examining the most effective and efficient form of training and learning method for learners, the utilization of ICT and LMS is considered as tool options for realizing such goals. Accordingly, the first thing that needs to be done in this step is to decide whether or not "remote implementation" is possible in light of the contents and objectives of the training (can the intended outputs be achieved remotely?), and next, if it has been decided that remote implementation is possible, design is carried out on what kind of combination of teaching materials (textbooks, videos, interactive media, etc.) and form of training (inspection, classroom learning, practical training, discussion, etc.) should be designed to achieve the objectives. Generally speaking, the types of training that are suited to online implementation and those that are not suited are as indicated below.

[26] Analysis, Design, Development, Implementation, Evaluation

Table-58 Training that is Suited to Online Implementation/ and Training that is Not Suited to Online Implementation

Training that is Suited	Training that is Not Suited
・Training that mainly comprises lectures (classroom learning) ・Training that mainly comprises inspections that can be viewed online (where there are no limitations due to corporate confidentiality, etc.) ・Training that entails no limitations due to time difference (contents that can be learned at any time in on-demand training) ・Third Country Training Program (TCTP) and other training that can be implemented in areas where the time difference is the same for the training side and the side being trained.	・As in the case of the Training Program for Nikkei Communities, traveling to Japan meaningful and essential. ・Onsite practical training and training that mainly comprises experience (contents in which the trainees need to conduct actual operations). ・Building of a face-to-face human network that is not only restricted to training times is an important element. ・Training that mainly comprises inspections that cannot be viewed online (where there are limitations due to corporate confidentiality, etc.) ・Training that entails major limitations due to time difference (in cases where the lecturers on the Japan side cannot work late at night or early morning, facilities are limited to opening times in Japan, etc.) ・Training that targets areas covering multiple differing time differences (some components of the Knowledge Co-Creation Program (KCCP) (Group and Region Focus), etc.)
Training that is Not Suited but in which Online Implementation is Possible to a Certain Extent	
・Cases of onsite practical training and experiences where the effects of training can be anticipated to an extent by means of virtual operations using VR, etc. (if simply watching is sufficient, the training is more similar to inspection than practical training) ・Even if online viewing on sites is not possible, cases where it is possible to view contents that have been recorded and edited in advance (factories, etc.) ・Contents that need to be implemented by the implementation agency late at night or early morning but not frequently (a few days a week, etc.)	

5.2.2 Sorting of Remote Training Implementation Methods based on Time Difference

The factor that has the greatest impact on remote training implementation methods in Latin America and the Caribbean is time difference. Focusing on this issue, remote training implementation methods are broadly divided into the following three cases. The methods of implementation differ greatly between these three cases.

Table-59 Sorting of Remote Training Implementation Methods Based on Time Difference

Classification	Definition		Example
	Country on the training providing side	Country participating in training	
Onsite	Latin America and the Caribbean	Latin America and the Caribbean	Third Country Training Program (TCTP), etc.
Bilateral	Japan	Latin America and the Caribbean	Knowledge Co-Creation Program (KCCP) (Group and Region Focus), Knowledge Co-Creation Program (KCCP) (Country Focus), Training program for Nikkei Communities, etc.
Multilateral	Japan	Numerous areas including Latin America and the Caribbean	Parts of the Knowledge Co-Creation Program (KCCP) (Group and Region Focus)

The following paragraphs describe the issues and caution points in each case.

(1) Onsite training

In the case of onsite training, because the training providing side and the training participating side are both located in Latin America and the Caribbean, basically there is no need to consider the issue of time difference. The same also applies when JICA Overseas Offices implement training communications, monitoring, etc., and the only time it is necessary to consider time difference is when an organization in Japan becomes involved in the training.

Merits	Issues
・ Real-time learning and communications can always be achieved during the training. ・ It is always possible to conduct remote monitoring and discussion that require instant feedback.	・ When an organization in Japan takes involvement in the implementation of training, time difference becomes an issue.

(2) Bilateral training

Bilateral training accounts for the large proportion of training under the Knowledge Co-Creation Program (KCCP) (Group and Region Focus), Knowledge Co-Creation Program (KCCP) (Country Focus), Training program for Nikkei Communities, etc. in Latin America and the Caribbean. Because the training providing side is the implementation agency in Japan, time difference problems are prominently manifested.

・ Because the training providing side is in Japan, it is easy for JICA to coordinate with the agency that provides the training.

[Issues]

・ If the training is implemented during work hours (daytime) on the local side, the training providing side in Japan has to work either late at night or early morning, and this imparts a major burden on the Japan side if training is implemented on consecutive days.

・ If training can only be implemented during the day in Japan time (for example, training that utilizes facilities that are only open during daytime, contents that need to be implemented during the day and so on), because the trainees must participate either late at night or early morning, the burden placed on them is large.

Merits	Issues
・ Because the training providing side is in Japan, it is easy for JICA to coordinate with the agency that provides the training.	・ If the training is implemented during work hours (daytime) on the local side, the training providing side in Japan has to work either late at night or early morning, and this imparts a major burden on the Japan side if training is implemented on consecutive days. ・ If training can only be implemented during the day in Japan time (for example, training that utilizes facilities that are only open during daytime, contents that need to be implemented during the day and so on), the burden placed on the trainees is large because they must participate either late at night or early morning.

(3) Multilateral training

In the case of multilateral training, there is sometimes participation by countries in time zones other than Japan, Latin America and the Caribbean: for example, African countries sometimes participate in training intended for Brazil, and there is sometimes participation by countries in Southwest Asia and Europe that have relatively large time difference with Japan. Since multilateral training involves multiple regions with large time differences, the issue cannot be resolved simply by synchronizing with one time zone as in the case of bilateral training, and this is the most difficult training for all target countries to simultaneously participate in.

Merits	Issues
・ Training that comprises the same contents can be simultaneously implemented to the entire world.	・ Because the training mode that includes real-time elements covers multiple time differences, implementation is extremely difficult. ・ On-demand training based on LMS and practical training based on submission of problems are the most effective.

5.2.3 Sorting of Remote Training Implementation Methods based on the Form of Training

Remote training methods are broadly divided into the following four cases according to the contents, not only limited to Latin America and the Caribbean. In these cases too, the implementation methods, etc. mutually differ greatly. In reality, many training programs comprise a combination of these four forms.

Table-60 Sorting of Remote Training Implementation Methods based on the Form of Training

Form	Explanation	Examples
Inspection	Specific agencies or sites are visited and inspected. In many cases, exchange of opinions is conducted with local persons in charge.	Visits to government agencies and corporations in Japan
Classroom learning	Mainly theoretical learning is conducted in lecture form. In many cases, training is conducted based mainly on textbooks or other teaching materials.	Learning of knowledge, actual cases in specialist fields
Practical training	The participants mainly conduct practical training by themselves. In many cases, this entails operating physical devices and equipment.	Agricultural practical training, and training related to methods of use of equipment in specialist fields, etc.
Discussion	The participants exchange opinions and conduct discussions. It is essential for this to be conducted in real-time.	Sharing of cases from the countries and agencies of the participants, etc.

5.2.4 Extraction of the Remote Training Implementation Pattern based on Combinations of Cases

Based on the abovementioned three cases of training categorized according to time difference and four cases of training categorized according to form of training, a total of 12 (3 x 4) training patterns can be considered. Training programs do not have to be limited to only a single training pattern, but

combinations of multiple patterns may also exist. The following paragraphs briefly describe the appropriate remote training implementation methods in each of the said 12 patterns.

(1) Onsite training × Inspection

In the case of onsite training combined with inspection training, because the inspection destination is also located in Latin America and the Caribbean, if it is not physically possible to visit the inspection destination, it is necessary to virtually visit by the method illustrated below. In the figures that follow, the blue circles indicate the IT tools that are used.

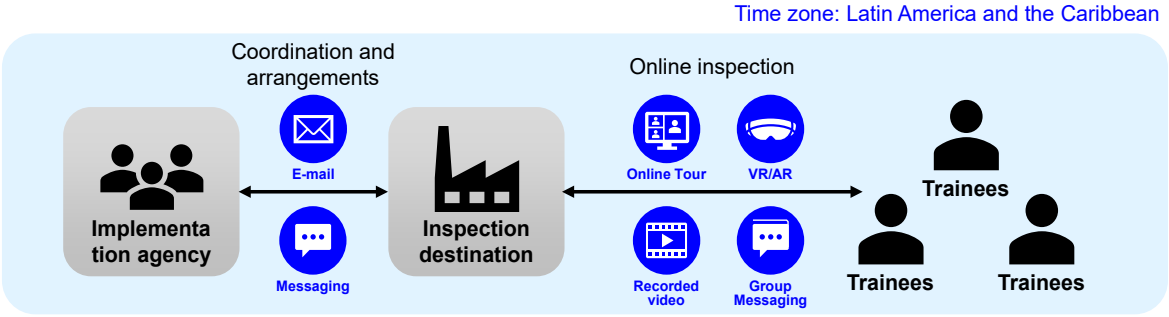


Figure-67 Pattern of Remote Implementation based on Onsite training × Inspection

- In onsite training, because the time zone is the same, it is possible to make real-time visits during work hours at the inspection destination.
- However, the tools that can be used will differ depending on the state of the internet environment used by the trainees. In the case of VR/AR, it is necessary to install 180/360-degree cameras, etc. onsite, and very large bandwidth is required to stream videos in real-time; hence, the training cannot be done if the sites do not have sufficient uploading bandwidth. It is more realistic to convey site conditions by utilizing a wearable camera (or conventional smartphone) and Zoom, etc.
- Moreover, if an inspection destination is a private plant and it is necessary to consider corporate confidentiality, since it is not normally possible to bring a camera onto site, it is often necessary to use pre-recorded and pre-edited videos.

(2) Onsite training × Classroom learning

In the case of onsite training combined with classroom learning, because there is no time difference, basically real-time training based on online lectures is deemed the most effective approach, however, if the same training contents are repeated on a regular basis, it is possible to also combine with on-demand training using videos and digital teaching materials that have been prepared in advance.

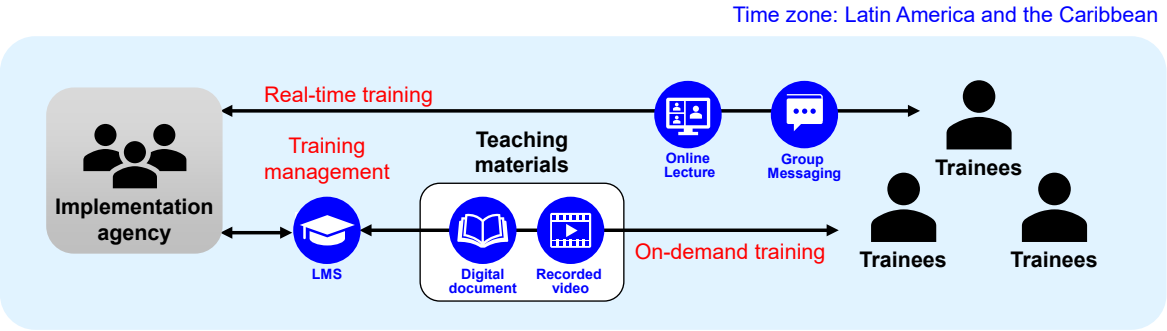


Figure-68 Pattern of Remote Implementation based on Onsite training × Classroom learning

- Fully exploiting the fact that the time zone is the same, implementing in the form that is closest to face-to-face lessons is thought to be the most effective method.
- When implementing on-demand training too, the training effect can be enhanced through periodically including online Q&A sessions and opportunities for online discussion.

(3) Onsite training × Practical training

In the case of onsite training combined with practical training, because there is no time difference, the most effective approach is thought to be the case where trainees conduct practical training and are supervised by a lecturer in real-time. If this is difficult, it is possible to give out practical training assignments, let the trainees tackle them and submit their results, and then evaluate their submitted work (sometimes this may include videos, etc. of the trainees performing the practical training).

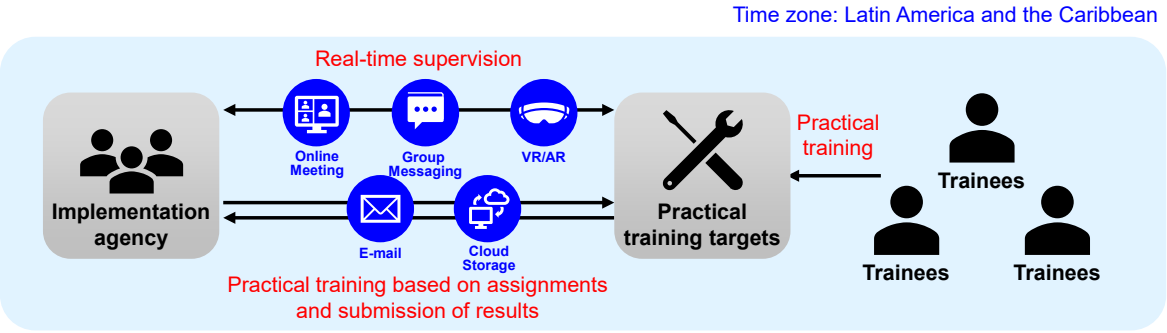


Figure-69 Pattern of Remote Implementation based on Onsite training × Practical Training

- Fully exploiting the fact that the time zone is the same, the most effective method is for the lecturer to supervise the practical training in real-time. However, remote implementation is very difficult to achieve if the lecturer needs to issue detailed instructions on every step of the training. It is also possible to utilize VR/AR, however, in the case where a lecturer supervises the condition of practical training on the side of trainees, this is not realistic unless VR/AR equipment is available on the side of the trainees. Conversely, it is also possible to utilize VA/AR in situations where the lecturer demonstrates an example. Since the said “example”

does not need to be shown in real-time, it is better to utilize pre-recorded and pre-edited videos to guarantee the quality of the teaching materials and permit repeated viewing, etc.

- If training is implemented based on the submission of assigned work, a major problem is that appropriate instructions cannot be given when the trainees are actually conducting work; hence, such an approach is not advisable for practical training that entails difficulty or contents in which mistaken operations could impart danger to the trainees.

(4) Onsite training × Discussion

In the case of onsite training combined with discussion, the most effective approach is to conduct conventional online meetings. In addition, it may also be a good idea to combine with group messaging (group chat), which enables comments to be recorded and conversations to be had outside of real-time, according to the objective.

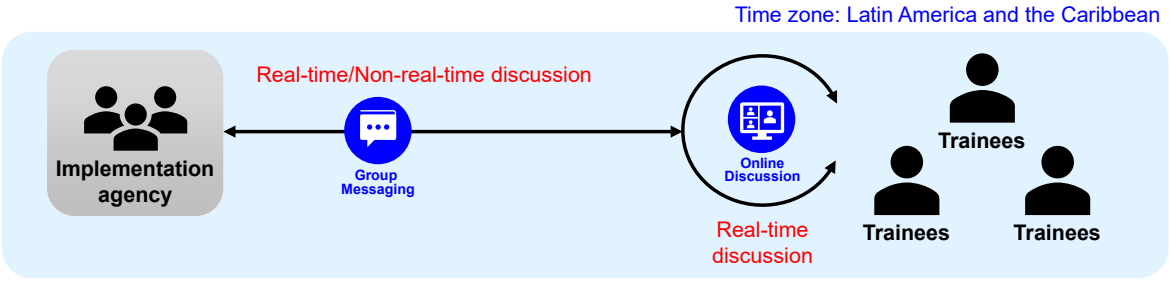


Figure-70 Pattern of Remote Implementation based on Onsite training × Discussion

- Discussion is not only limited to that between the trainees and implementation agency. It is also effective to facilitate so that the trainees can freely conduct discussions with each other.

(5) Bilateral training × Inspection

In the case of bilateral training combined with inspection, because the inspection destination is usually a facility in Japan, considering the time difference with Latin America and the Caribbean, it is almost impossible to conduct real-time inspections. Accordingly, there is no other choice than to implement pseudo inspections using pre-recorded videos, etc.

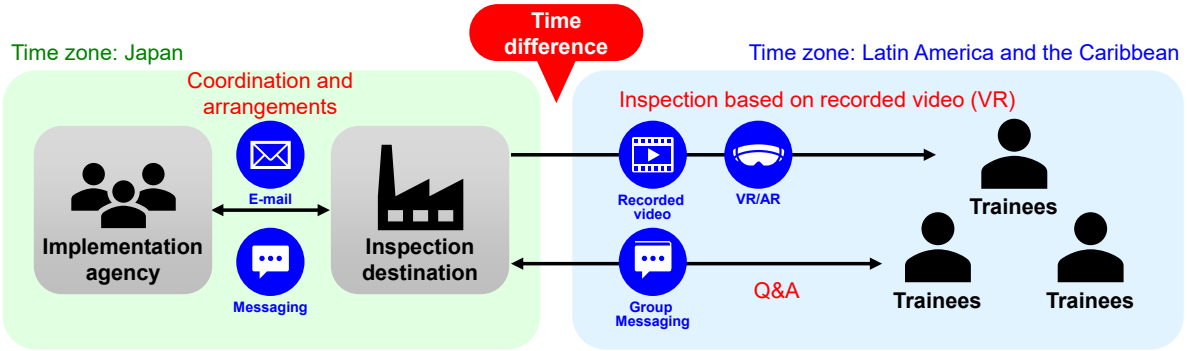


Figure-71 Pattern of Remote Implementation based on Bilateral training × Inspection

- The pre-recorded videos can also be conventional videos or VR videos (180/360 degree videos).
- If an inspection destination is a private plant and it is necessary to consider corporate confidentiality, it is necessary to always show the contents of the videos to the inspection destination for its confirmation beforehand.

(6) Bilateral training × Classroom learning

In bilateral training combined with classroom learning, time difference is a major problem. Because conducting online lectures in real-time for the local side places a very great burden on the Japanese side, it is usually more advisable to conduct on-demand training using LMS. However, to sustain the motivation of trainees, it is also effective to incorporate real-time lessons only for some important contents, etc.

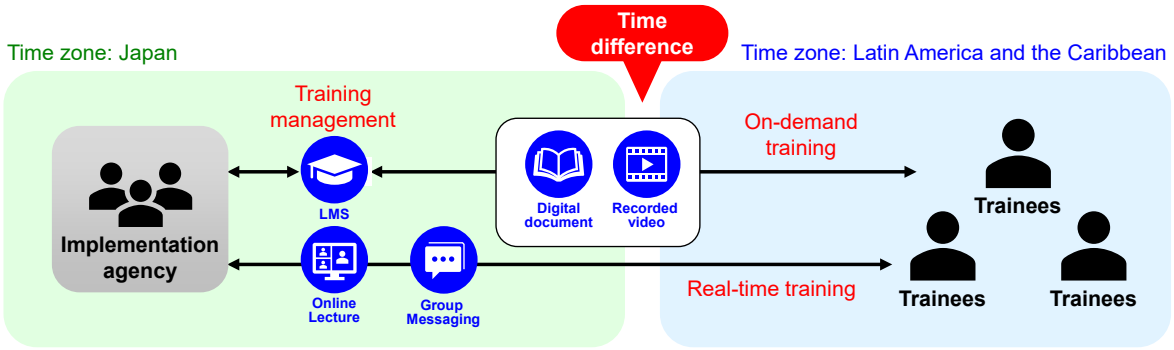


Figure-72 Pattern of Remote Implementation based on Bilateral training × Classroom Learning

- Even with classroom learning, the training effect can be enhanced through periodically conducting online Q&A sessions and including opportunities for online discussion.

(7) Bilateral training × Practical training

In the case of bilateral training combined with practical training, because time difference is a major problem, it is extremely difficult to conduct the guidance of practical training in real-time. If the trainees can do the practical training by themselves (while referring to teaching materials), it is possible to issue assignments and have the trainees submit their answers, however, if that is not possible (real-time supervision is required), because the practical training needs to be instructed from Japan late at night or early in the morning, thereby placing an immense burden on the Japanese side, consideration should be given to replacing the practical training with other contents.

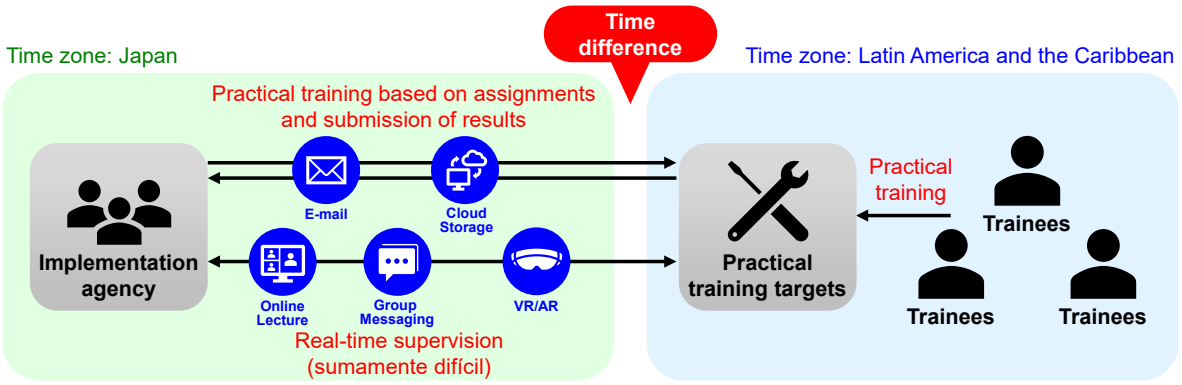


Figure-73 Pattern of Remote Implementation based on Bilateral training × Practical Training

- It is also possible to utilize VR/AR, however, when the lecturer supervises conditions of practical training on the side of trainees, it is necessary to install VR/AR equipment on the side of the trainees, which is not realistic. Conversely, VR/AR can be used in cases where the lecturer displays an example. However, again, since this is also an "example", it is not really necessary to conduct in real-time. Rather, using pre-recorded and pre-edited 180/360-degree videos, etc. and adopting the "assignment submission" method is more preferable in terms of securing the quality of teaching materials and enabling contents to be viewed repeatedly.

(8) Bilateral training × Discussion

In the case of bilateral training and discussion, it is most effective to implement through conventional online meetings, however, because the time difference makes it difficult for the Japan side to participate frequently, it is more advisable to have the Japanese side participate once a week and so on, or only implement between the trainees with the Japanese side only joining at important points. In addition, it may also be a good idea to combine with group messaging (group chat), which enables comments to be recorded and conversations to be had outside of real-time, according to the objective.

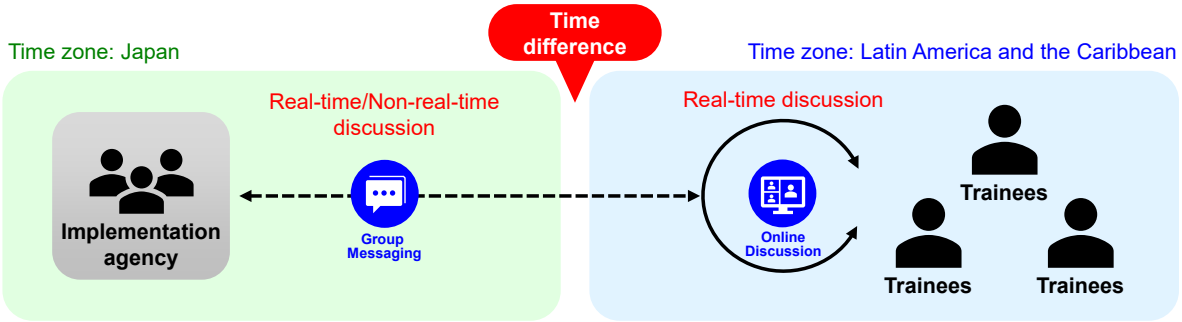


Figure-74 Pattern of Remote Implementation based on Bilateral Training × Discussion

(9) Multilateral training × Inspection

In the case of multilateral training combined with inspection, since time difference issues arise between multiple time zones, it is totally impossible to implement inspections in real-time. Accordingly, there is no other choice than to implement pseudo inspections using pre-recorded videos, etc.

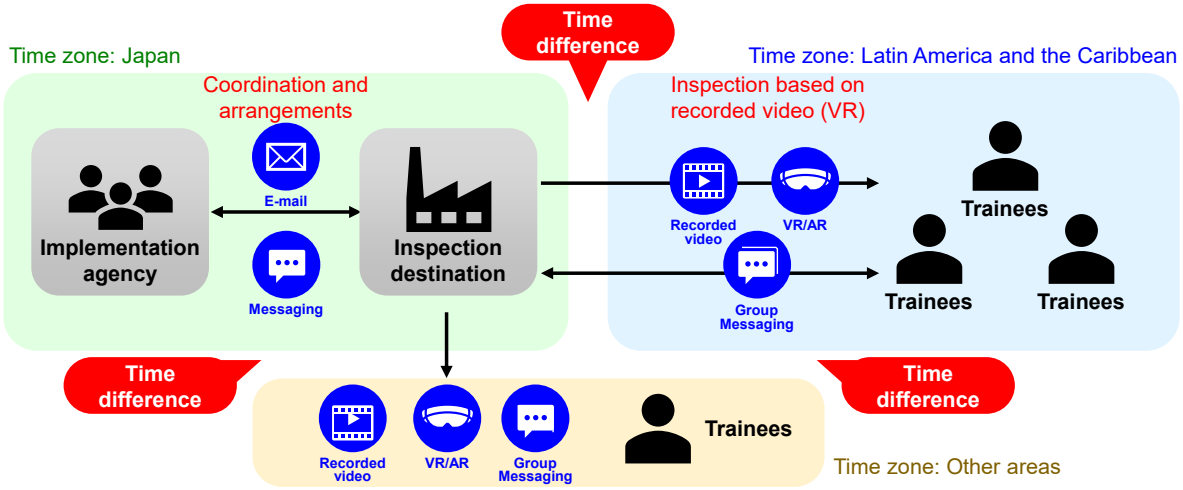


Figure-75 Pattern of Remote Implementation based on Multilateral Training × Inspection

- The pre-recorded videos can also be conventional videos or VR videos (180/360 degree videos).
- If an inspection destination is a private plant and it is necessary to consider corporate confidentiality, it is necessary to always show the contents of the videos to the inspection destination for its confirmation beforehand.

(10) Multilateral training × Classroom learning

In the case of multilateral training combined with inspection, since time difference issues arise between multiple time zones, it is totally impossible to conduct real-time lectures, etc. Accordingly, there is no choice but to conduct on-demand training that utilizes LMS, etc.

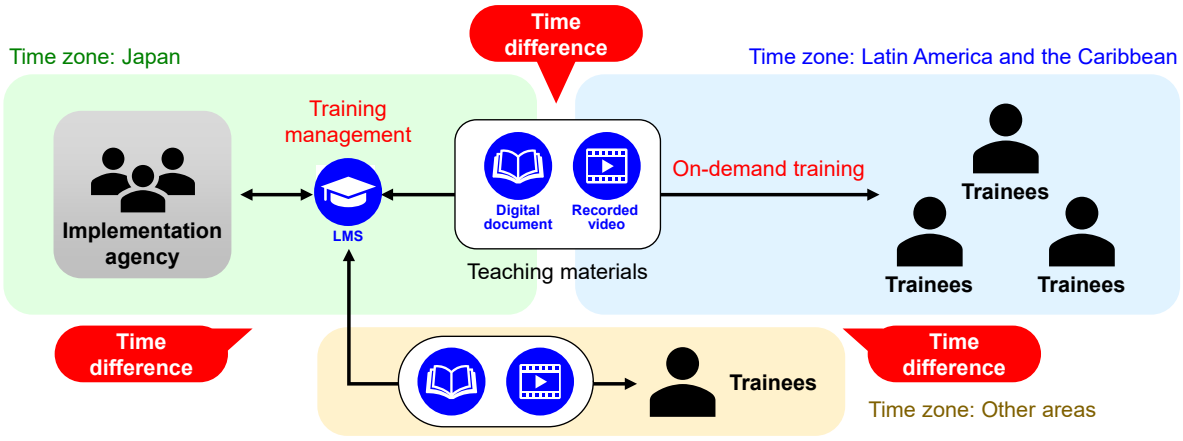


Figure-76 Pattern of Remote Implementation based on Multilateral Training × Classroom Learning

- If it is absolutely necessary to conduct lectures in real-time, it becomes necessary to implement the same contents in multiple time zones.
- There have been cases of conducting lectures in real-time in specific time zones that have a lot of trainees, while using recorded videos in other time zones, however, because the motivation of trainees drops significantly when recorded contents are accompanied by consecutive interpretation, this approach is not recommended. Rather, “easy-to-view” video teaching materials that are dubbed should be produced and used in on-demand training.

(11) Multilateral training × Practical training

In the case of multilateral training combined with practical training, since time difference issues arise between multiple time zones, it is totally impossible to conduct real-time guidance. Accordingly, there is no choice but to let trainees conduct practical training as private study.

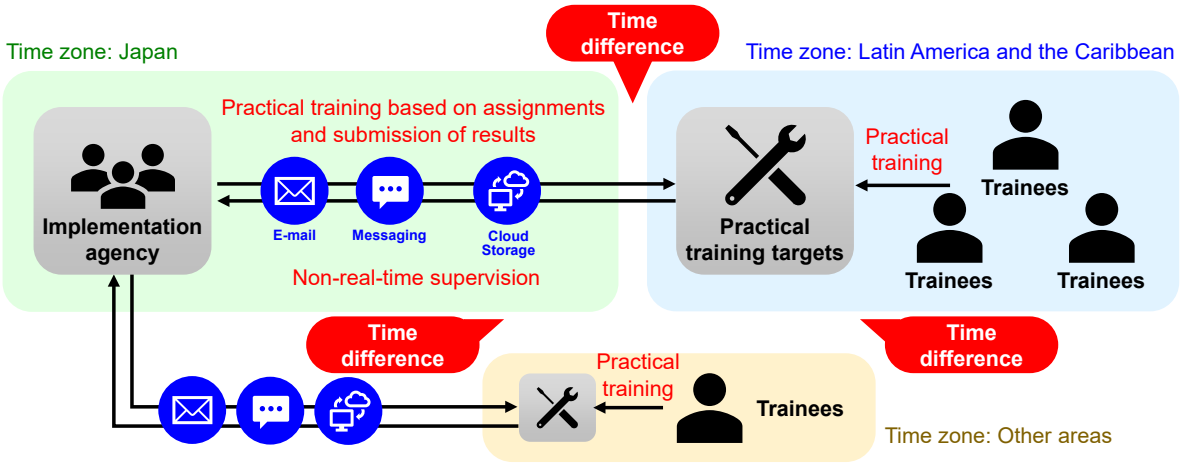


Figure-77 Pattern of Remote Implementation based on Multilateral Training × Practical Training

- It is also possible to utilize VR/AR and demonstrate a lecturer showing the procedure of practical training in a 180/360-degree video, etc. so that trainees can repeatedly watch the contents while conducting private study.

(12) Multilateral training × Discussion

In the case of multilateral training combined with discussion, since time difference issues arise between multiple time zones, it is totally impossible to have real-time discussions with full participation. Accordingly, there is no choice but to limit real-time discussions to trainees in the same time zone, and then use a group chat tool, etc. to conduct asynchronous discussions.

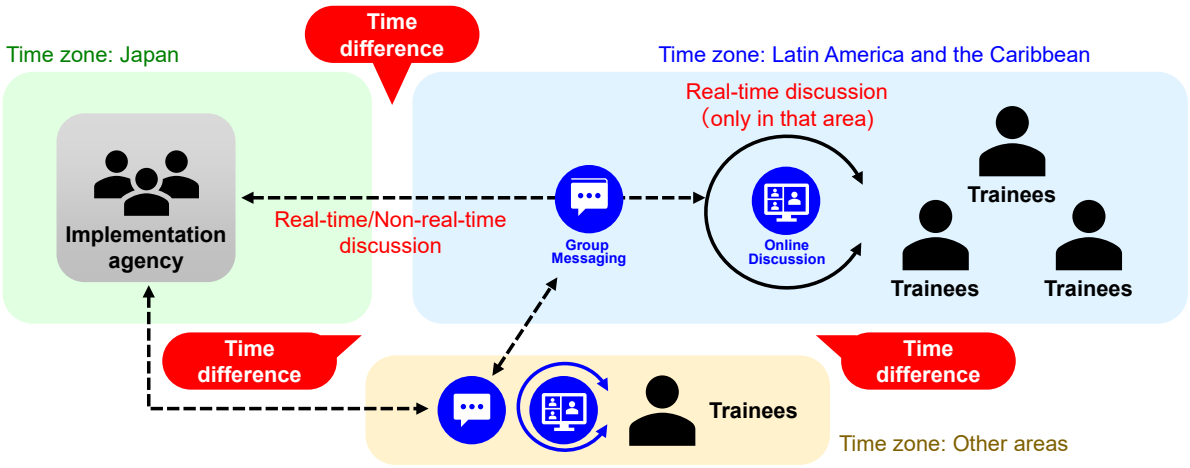


Figure-78 Pattern of Remote Implementation based on Multilateral Training × Discussion

5.2.5 Determine the Feasibility of Remotely Implementing Each Pattern

Feasibility of implementation is determined for all of the training element patterns. For example, assuming the case of training that includes "Bilateral training × Practical training", if the contents of the practical training are such that it must be implemented in Japan, it must be judged that the said pattern is unfeasible. Also, there are cases where the feasibility of implementation needs to be determined based on cost. Similarly, feasibility of remote implementation is decided for the other patterns too.

If a pattern is judged to be unfeasible, it is necessary to advance examination upon assuming that the said pattern will not be implemented in the training or the training will be implemented upon changing to a separate pattern. In either case, since the contents have been selected as the optimum form of training for trainees in 5.2.1, such examination will inevitably impact the feasibility and degree of achievement of the training goals. Selecting a different pattern as an alternative naturally implies changing the contents of training. If such changes are acceptable in light of the training goals, procedures 5.2.1-5.2.4 will be repeated for the changed contents. If the changes are not acceptable, it is concluded that the training in question cannot be implemented remotely.

5.2.6 Examination of Cases where the Internet Environment is Poor

When determining whether the aforementioned patterns can be implemented, the internet environment when trainees participate remotely is extremely important. It is planned to conduct video-centered training using online meeting tools, video teaching materials, etc., and in cases where it is forecast that the internet environment on the side of the trainees is poor, it will be necessary to examine countermeasures according to the following procedure. Such examination should really be implemented in the training planning stage, however, in reality, since it is common for participants to be recruited after the contents of training have been decided, it is often conducted in respect to the participants before the start of the training.

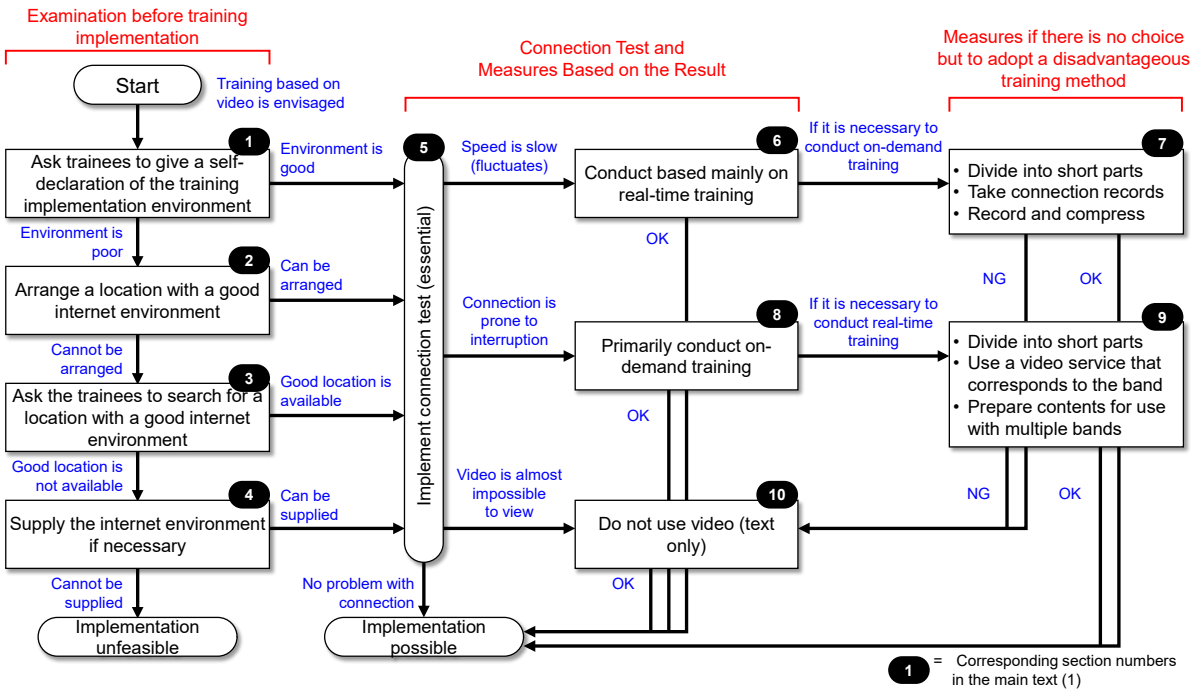


Figure-79 Countermeasures in Cases where the Internet Environment is Poor

(1) Ask the participants to give a self-declaration regarding the training implementation environment

Ask the trainees to use fast.com and give self-declarations regarding the internet lines from their remote training environment, and from the results determine whether the internet lines have sufficient speed to participate in remote training. The required speed for participation depends on the contents of the teaching materials prepared on the implementing side, however, a rough guide is given below.

Speed (bandwidth) needed for remote training by video: Roughly 10 Mbps

Figure-80 Measurement of Internet Environment using fast.com

As a result, if the internet environment on the side of the trainees is deemed to be not good enough, conduct the examinations described below.

(2) Arrange so that training can be implemented in a location where the internet environment is good

Ask the JICA Overseas Offices to make arrangements for the trainees to be assembled to receive training in locations that have a good internet environment (hotels in large cities, JICA offices, C/P agencies, etc.). Because this method enables all the trainees to receive training in the same environment, it averts the issue where specific trainees cannot participate due to a poor internet environment. If such arrangements cannot be made, the methods described in the following sections should be considered.

(3) Have the trainees search for a location where the internet environment is good

Ask the trainees to locally search for locations with a good internet environment as much as possible. For example, have them utilize fast.com, etc. to compare the Wi-Fi in numerous internet cafes and find the location that has the best line conditions. If trainees still cannot find a location with a good internet environment, consider the methods described below.

(4) Supply the internet environment where necessary

In some areas, mobile lines are sometimes more stable than Wi-Fi. However, because mobile lines generally tend to be low-speed and charged (meter rate), it is necessary to take additional steps such as subsidizing the individual connection charges (prepaid charge, etc.). Even when lending mobile Wi-Fi, because the line is a mobile line, similarly it is necessary to subsidize the communication charges. If it is not possible to take any of the measures described in (1)-(4), it will be impossible to remotely implement practical training.

(5) Implement a connection test

If any of the abovementioned measures are feasible, using the said environment, ask all the trainees to implement a connection test before the training. In such a connection test, determine whether video-based training is feasible by using online meeting tools, training video samples, etc., and implement the training if there is no problem. However, if this is not possible, conduct the following kind of examination.

Cases of poor internet environment can broadly be divided into 2 types. One is the case of slow connection speed (or fluctuating connection speed), and the other is the case of connection being prone to interruption. Although the conditions are similar, the response in each case is quite different. Depending on which situation is more applicable, the appropriate methods of remote training will differ as follows.

1. Case where connection speed is slow (or fluctuating) → (6)
2. Case where the connection is prone to interruption → (8)
3. Case where video viewing is almost impossible → (10)

(6) Case where connection speed is slow (fluctuates)

It is comparatively more advantageous to conduct real-time training using online meeting tools (Zoom, Teams, etc.). This is because online meeting tools have features for automatically adjusting connections according to changes in the line speed. On the other hand, such an environment is not advantageous for on-demand training (LMS). Concerning why, because the video contents prepared in advance are made on a certain bandwidth, if the line bandwidth is lower than that, it will not be possible to normally receive the video data, meaning that the video will be frequently interrupted or stop being displayed at all. If there is no choice but to conduct on-demand training (LMS) in an environment with slow connection speed, it is recommended that the following kind of countermeasures be taken.

(7) On-demand training (LMS) in environments where connection speed is slow (fluctuates)

1. Use a video service (YouTube, Vimeo, etc.) that allows the video band (picture quality) to be adjusted automatically according to the line bandwidth. In particular, utilize a streaming service (mainly used for live transmissions) within such services.
2. Build and use an independent streaming server (Linux-based servers are common[27].
3. Prepare multiple contents corresponding to different bandwidths (or corresponding to the minimum bandwidth).
4. Make each unit of the contents as short as possible.

(8) Case where connections are prone to being interrupted

On-demand training using LMS, etc. is comparatively more advantageous. That is because, even if the connection is interrupted, it is possible to resume on-demand training from where it was interrupted – viewing can be continued any number of times whenever convenient. On the other hand, real-time training (lectures using Zoom or Teams) is disadvantageous in such an environment. That is because, disconnections during real-time training directly result in the training being interrupted. In particular, if the connection is interrupted for specific trainees only, it means that these trainees mill miss out on the lectures. If there is no other choice but to conduct real-time training in an environment that is prone to disconnections, it is recommended that the following kind of countermeasures be taken.

(9) Real-time training in environments where connections are prone to being interrupted

1. Be sure to keep a record of the trainees who couldn't view the contents. Doing so will make it possible to provide follow-up support to trainees according to the parts of the training they

[27] https://en.wikipedia.org/wiki/List_of_streaming_media_systems

missed. For example, in the case of a Zoom webinar, configure so that the online status of participants is automatically recorded.

2. For trainees who cannot view contents, record the contents of real-time training so that trainees can view them later. However, because video recordings in such cases tend to be extremely heavy (large size), it is important to reduce the necessary bandwidth (reducing picture quality or compacting) by using video editing software, etc.

3. Divide lectures into multiple parts or reduce the time of individual lectures. Doing so makes it possible to shorten the parts that could not be viewed (parts that need to be viewed again), and even if viewing recorded videos, viewing is easier because each video is shorter.

(10) Cases where viewing videos is almost impossible

If the environment for trainees is so bad that viewing videos is not possible, the best thing is not to use online videos. In extremely poor environments, teaching materials that comprise videos or audio contents take a long time to upload and download and are especially unsuited to real-time training due to frequent interruptions. Even in the case of on-demand training, especially when using SCORM format [28], it is often impossible to conduct any operations whatsoever until all the contents have been read.

The most effective type of teaching materials in cases where the connection environment is too poor to allow use of videos are text-based teaching materials. If copyright restrictions are not too stringent, because such teaching materials (PDF, etc.) can be downloaded when the internet connection is good and read at leisure afterwards without worrying about the connection, it has been demonstrated (in the Kaizen e-learning project in Ethiopia) that a far higher training effect can be obtained compared to cases of using teaching materials that can only be viewed when the internet is connected (materials that combine PowerPoint picture-stories and audio commentaries, materials that comprise audio contents only and so on). Also, whenever the need arises, rather than conducting training based on online teaching materials, thought should be given to utilizing conventional technologies such as shooting and editing DVD teaching materials and sending them to trainees beforehand.

[28] https://en.wikipedia.org/wiki/Sharable_Content_Object_Reference_Model

5.2.7 Decision regarding Tools Used in Each Pattern

For each training pattern that is deemed to be feasible for remote implementation, the tools to be used are decided. The following table summarizes the methods for preparing each tool.

Table-61 Summary of Methods for Preparing Environment according to Each Tool

	Tool	Necessary equipment and specific examples	Introduced place	Necessary line speed and quality	
				Implementation agency side	Trainees' side
	Online meetings	・ Subscription to a Web service (Zoom, Teams, etc.) ・ Web cameras, mics, etc. according to necessity	Implementation agency and trainees	A reasonably high-speed upload bandwidth (roughly 10Mbps or more)	Same as on left
	Group messaging (chat)	・ Subscription to a Web service (WhatsApp, etc.) ・ Where necessary, linked external Web services and/or apps	Implementation agency and trainees	Conventional internet line (low-speed is also possible)	Same as on left
	Digital documents	・ Digital document creation tool (Adobe Acrobat, etc.)	Implementation agency	Conventional internet line (low-speed is also possible)	Same as on left
	Cloud storage	・ OneDrive, Dropbox, etc.	Implementation agency and trainees	No particular limitations (because connection is often automatically adjusted according to line speed, etc.)	Same as on left
	Web videos	・ Video camera (Web camera or smartphone is also possible) ・ Subscription to a Web video service (YouTube, Vimeo, etc.)	Implementation agency	A reasonably high-speed upload bandwidth (roughly 10Mbps or more)	Same as on left
	VR videos	・ 360-degree camera (180-degree camera) ・ Subscription to a Web video service (YouTube, Vimeo, etc.)	Implementation agency	Real-time streaming: Very high-speed internet line (roughly 50Mbps or more) Recording: Conventional internet line	A reasonably high-speed upload bandwidth (roughly 10Mbps or more)
	LMS	・ Subscription to a LMS service (Cornerstone OnDemand, Moodle, etc.)	Implementation agency	Conventional internet line (depending on the teaching materials that are used, the necessary speed will change)	Same as on left

Note: General tools such as email, online storage, etc. are omitted here.

5.2.8 Creation of Training Teaching Materials using Tools

Depending on the tools that are used, the methods used to create effective teaching materials for training differ as described below.

(1) Online meetings/training

The most commonly used teaching materials in online meetings and training based on Zoom or Teams are presentations given using PowerPoint, etc. Even if a lecturer does not give such presentations in person, it is also possible to play recorded videos of presentations. PowerPoint includes such a feature (presentation recording feature) which makes it possible to record a presentation with audio commentary (either the entire presentation or each slide) and output it in a video file.

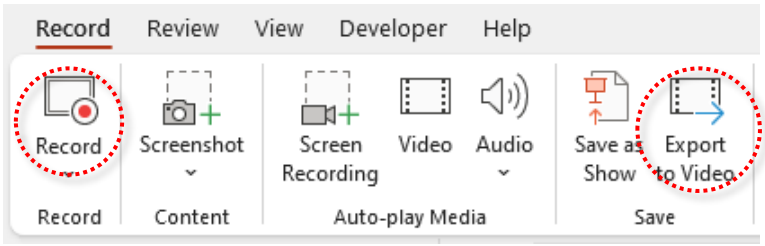


Figure-81 PowerPoint Recording Tool

(2) Group messaging (chat)

Messaging apps are basically used for communicating with trainees in real-time/non-real-time, however, recent apps increasingly include features for conducting not only chat but also automatically gathering information from various external apps and sources and displaying them on the chat screen. These are increasingly being used as primary information gathering apps not only for training but also within project teams and work groups. The best examples of this are Teams and Slack.

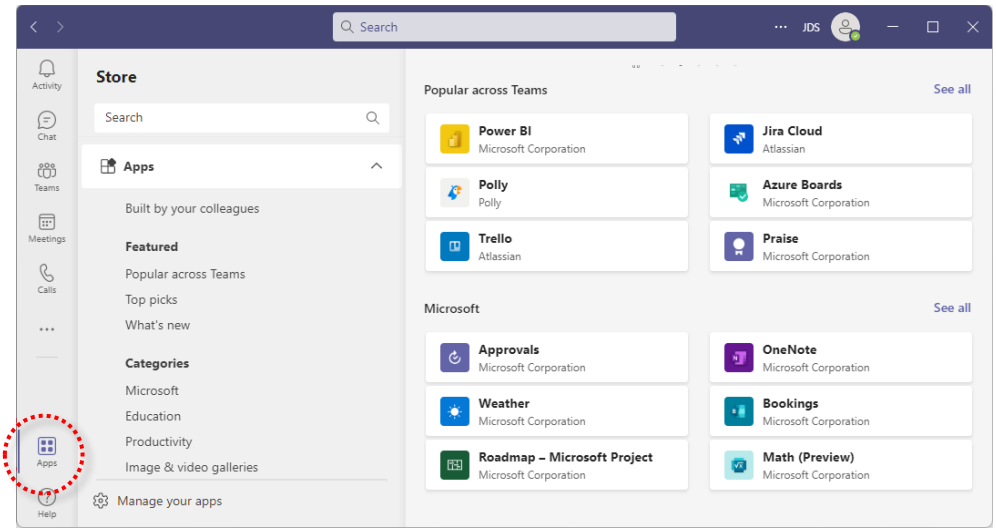


Figure-82 Screen Listing Apps that can be Linked with Teams

As is indicated in the above figure, for example, Teams can now be linked with numerous external apps, and it only requires a little coding to link Teams with other apps and websites not shown here. By using this feature, specifically it is possible to realize the following things.

- Customized tabs can be added to the "Tab" column on the left. (For example, "Training management" tab, etc.)
- When a specific change arises in an external system, a message can be automatically displayed in the Teams chat field. (For example, when trainees respond to a questionnaire or finish a course on LMS, an automatic notification is sent to the lecturer).
- From specific text that is written in the chat field, unique processes can be implemented. (For example, searching of FAQs, sending of emails to trainees, starting of specific apps, etc.)
- Processing can be automatically conducted from information and events such as described above. (For example, chatbot, etc.)

Accordingly, messaging apps can be used not only for simple chat but also for purposes such as acquiring various information and automating tasks related to training.

(3) Web video

When using videos as remote training materials, the point that merits the most attention is "bandwidth". If the video viewing side does not possess an internet line equipped with sufficient bandwidth, it will not be able to watch the created video teaching materials. Accordingly, ample attention needs to be given to the video bandwidth when making.

Here, "bandwidth" refers to the data volume per unit of time. In digital videos, the video is realized through rapidly switching pictures comprising many frames every second, however, in order for this to be viewed remotely over internet lines, data comprising a certain number of frames must be received without delay every second. However, if the internet line does not have sufficient speed, it will not be able to receive the necessary number of frames within the given time, making it impossible to play the video. Accordingly, unless a line that is faster than the bandwidth used when producing a video is used, it will not be possible to view the video (see the following figure).

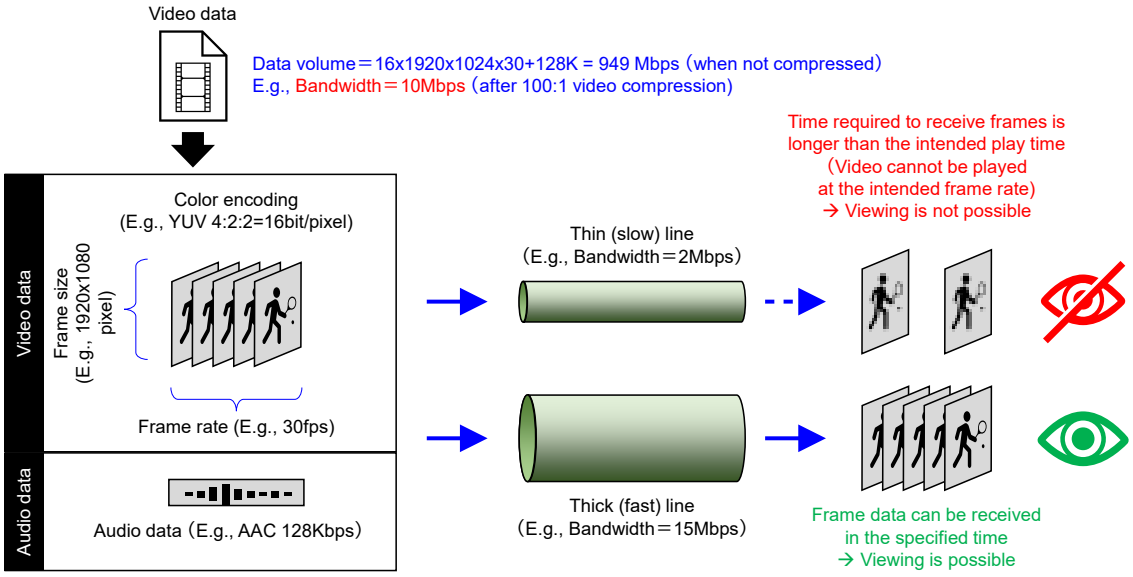


Figure-83 Importance of Bandwidth for Web Videos

Accordingly, when making video teaching materials, it is necessary to first investigate the bandwidth (speed) of internet lines on the viewing side and then produce video data that is small enough (has small enough data volume per unit time) to be viewed on such lines.

To limit the video data volume, as is shown in the figure, parameters such as frame size, frame rate, color format, compression ratio, etc. need to be appropriately adjusted. This also depends on the video contents, but the most convenient method is to adjust the compression ratio. In addition, generally with videos that contain a lot of text and figures, it is effective to lower the frame rate, while in the case of videos that have a lot of rapidly moving contents, it is effective to limit the frame size. Moreover, in cases where the necessary bandwidth differs between multiple trainees, basically the contents should be adjusted to the trainee with the least favorable environment, however, if this causes the video picture quality to become too poor, as is described in 5.1.6 (7), it is necessary to take steps such as preparing videos for multiple bandwidths or using a streaming service and so on.

(4) VR video

VR videos are a highly effective training tool in that they allow viewers to experience the contents almost as though they are there in person. However, when distributing VR videos in real-time, since the bandwidth needed by VR videos is frequently far larger than that of Web videos as shown in the following figure, such videos should not be used without first fully examining the necessary bandwidth. However, even if a VR video is the same, such problems will not arise if the contents are still image shot by a 360-degree camera (described later).

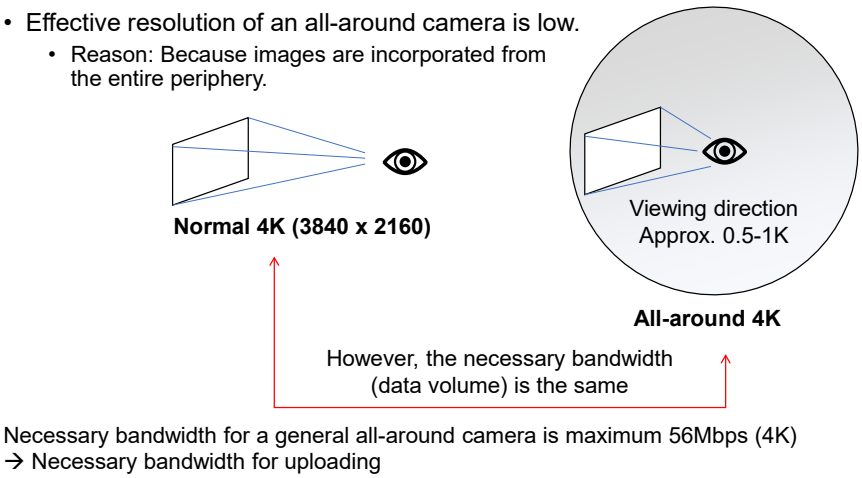


Figure-84 Caution Points when Using VR Videos in Remote Training

If using for inspection:

- Take a 360-degree camera to inspection destinations and have trainees observe conditions on the ground shot either in real-time or recorded. The trainees can view whatever direction they like within videos. However, as described above, in the case of real-time distribution, since very large bandwidth is required, it is safer to use pre-recorded and pre-edited video teaching materials. Moreover, depending on the training contents, ample training effects can be anticipated using still images shot by a 360-degree camera rather than moving pictures. As a specific example, on Google Map street view, there are locations where still images inside facilities shot by a 360-degree camera are provided, and the same thing can be utilized as an alternative to onsite inspections. Moreover, still images do not necessarily have to be shot by a 360-degree camera but are often created using a conventional smartphone camera app (Google genuine camera app, etc.), although doing this may take more time and effort [29].

If using in practical training:

- If the trainees conduct practical training simultaneously in the same place, it is possible to simultaneously monitor the progress of all the trainees by using a 360-degree (all-around) camera.

5.2.9 Remote Training Implementation

Remote training is implemented using the remote training teaching materials and tools that have been prepared in advance. In remote training, since it is possible that unforeseen technical problems (especially concerning the environment on the side of trainees) will arise after the start of training, it is also necessary to make preparations so that the implementation method can be flexibly adjusted or revised according to the contents described earlier in 5.2.6 and so on.

[29] https://minto.tech/360degree-camera-app/

5.3 Necessary Structure and Recommendations for Remote Training Implementation

The following table shows the basic division of work between JICA Overseas Offices and training implementation agencies when remotely implementing training. Basically, the technical operations pertaining to the implementation of remote training should be undertaken by the training implementation agency as far as possible, while the JICA Overseas Offices should focus on preparing the environment (especially the internet connection environment) on the side of trainees that enables the remote training to be smoothly implemented.

Table-62 Basic Division of Work between JICA Overseas Offices and Training Implementation Agencies

JICA Overseas Offices	Training implementation agency
・ Set days and times that are easy to participate for trainees ・ In remote training, because trainees often participate in training while undertaking their routine work: ➢ Appropriately set each day's training time (if trainees are expected to participate on all days, consecutive participation may hinder their regular work duties. If training is implemented on multiple days, it is necessary to limit the participation time on each day to no more than half a day and so on). ➢ Send letters to affiliated agencies asking for their consent so that their workers can participate in the training while continuing their regular work duties. ・ Make arrangements to secure locations with good internet environment and assemble trainees there. If this isn't possible, arrange for the lending of mobile Wi-Fi devices, etc. (See 5.2.6 (1)- (4))	・ Confirm the internet connection environment on the side of the trainees (in the case of real-time training, implement a briefing conference, etc. in advance to check the connection status. In the case of on-demand training, have trainees watch an introductory video produced using the same settings as the main training to check whether videos can be viewed). ・ If implementing in a location where the internet environment is poor, fully consider dividing the lectures or configuring the bandwidth of contents and so on. (See 5.2.6 (5)- (10)) ・ Take measures to address cases where trainees cannot participate in training or view videos.

The following paragraphs describe the necessary operating structure in each entity.

5.3.1 Necessary Operating Structure in JICA Overseas Offices

Concerning the operating structure of JICA Overseas Offices necessary for efficiently and easily implementing remote training in Latin America and the Caribbean, the following contents are considered.

(1) Specify items that can be addressed on the side of the trainees

For implementing remote training, since it is important to take steps on both the implementation agency side and the side receiving training, for example, it may be effective to specify the points that need to be confirmed on the side of trainees before the start of the training. Specifically, as was described in 5.2.6, as a minimum, it is necessary for the trainees to measure the speed of the internet line in their own training environment and convey it to the training implementation agency.

Moreover, if possible, JICA should create something like a “Remote Training Implementation Environment Confirmation Procedure” that can be commonly used around the world and include it in the GI. Such a procedure could include the following kind of contents.

- Have trainees view multiple test contents of differing bandwidth and respond online whether they can see them. Such test contents may be regarded as “Remote training orientation”.
  → If possible, it should be made possible to automatically measure bandwidth on the side of the sites.
- If trainees know the type of their lines (Wi-Fi/mobile, ADSL, optical line, etc.), have them declare them.
- Have the trainees declare their system composition (PC model name, OS version, CPU, memory, etc.). If it is possible they are using extremely old PC, etc., since there is a risk that they cannot use basic tools such as Zoom, depending on the contents of responses, have JICA communicate the recommended viewing environment.

(2) Listing of local locations equipped with a remote training environment

As was described in 5.2.6 (2), it is desirable for the JICA Overseas Offices (employing local subcontractors) to first investigate and list the locations (hotels, etc.) that have an environment capable of hosting the remote implementation of training. Such investigation should cover the specific internet environment (type of line, speed, etc.), number of persons who can be accommodated, conditions of use, cost, etc. Moreover, if possible, it would be convenient to have a list of facilities in each main provincial city.

(3) Establishment of a system for subsidizing data charges for trainees who only have mobile lines

As was described in 5.2.6 (4), for trainees who can only use mobile internet lines, a system for subsidizing metered data charges should be established. Alternatively, even using the same mobile lines, it is possible to lend Wi-Fi routers with prepaid data charges.

(4) Listing of operators who can locally produce teaching materials (LMS teaching materials) for on-demand training

When using on-demand teaching materials based on LMS, etc. in remote training, the training implementation agency can make the materials if it possesses the necessary skills, but if not it will need to outsource the production of the teaching materials. When doing so, if possible, since there is a higher possibility of realizing higher quality teaching materials if the production company is well-versed in the target country’s culture and so on, it is a good idea to prepare a list of such companies and introduce companies to the training implementation agency or contractor if necessary.

(5) Creation of a response flowchart for when trainees have questions

Concerning when trainees have questions concerning remote training, a flowchart should be compiled to specify the scope that JICA Overseas Offices should respond to and the scope that should be directed to the training implementation agency. By doing this, whenever trainees have questions, it is possible to ensure that the same answers are given regardless of who receives the questions in the JICA Overseas Offices.

(6) Creation of a permanent channel used for remote training-related inquiries and communications

It would be extremely effective to establish a permanent channel for receiving inquires related to remote training from trainees. If emails, etc. are always directed to specific members of staff only, problems will arise when such staff members are on leave or retire. The permanent channel may have an email address that is not linked to any specific individuals (for example, training_contact@xxx.xxx.xx) or it may be a WhatsApp account. In any case, it is necessary to ensure that any inquiries are automatically notified to all staff members (or the staff in charge of training at that time) so that no inquiries are overlooked.

5.3.2 Necessary Operating Structure in Training Implementation Agencies and Contracted Agencies

Concerning the operating structure of training implementation agencies and contracted agencies necessary for efficiently and easily implementing remote training in Latin America and the Caribbean, the following contents are considered.

(1) Establish the basic response policy in respect to time difference

In training that targets Latin America and the Caribbean, because the time difference is the greatest obstacle to implementation, to implement remote training that is continuous and sustainable into the future, first it is necessary for the implementation agency to establish a basic policy for addressing this issue (or to have the JICA side request such a policy). For example, a structure in which lecturers need to teach early in the morning or late at night on consecutive days is not desirable in terms of the impact on the implementation agency's regular operations. Accordingly, it is necessary to establish in advance a policy concerning how frequently staff members can teach, how much work they can handle (implementation of real-time lectures or support for trainees), and the ratio of on-demand training and real-time training that can be handled.

(2) Construction of a curriculum structure and syllabus suited to remote training

In remote training, compared to face-to-face training, it is necessary to construct curriculum and syllabus while paying attention to the following kind of points. Specifically, corresponding to the training implementation environment, etc. that is declared by the trainees (or forecast), the training contents and implementation methods should be examined upon having the JICA side present the

procedure that was indicated in 5.1.When doing this, it is necessary to select a combination that can be realized using the IT infrastructure, tools and equipment that already exist in the, implementation agency or have the , implementation agency procure such items as needed, and it is important to design the granularity, bandwidth, etc. of contents corresponding to the trainees' implementation environment. Also, the LMS utilization guidelines that were created in this Study should be used.

(3) Handling of copyright for online teaching materials

When creating LMS teaching materials for remote training, the handling of copyrights often becomes problematic. Unlike face-to-face training, the videos and texts that are used in lectures can be viewed by persons other than the trainees or copied without permission by the trainees. It is thus necessary to reach an agreement with the JICA side in advance concerning how to prevent such activities or how far to allow them. In the case of videos, etc., on online video services (Vimeo, etc.), it is possible to take measures such as setting a password for viewing, while on streaming services, etc., it is possible to stop contents being downloaded as files. However, for example, since it is not possible to prevent people from recording pictures of PC screens with a camera and so on, it should be realized that the side implementing the training cannot completely prevent such violations.

(4) Establishing a structure for enabling training based only on the local language

In remote training, compared to face-to-face training, consecutive interpreting should be avoided as much as possible. Consecutive interpreting means that double the time is required to teach the same contents, i.e. half the time is wasted for the trainees.

Specifically, in real-time training, consecutive interpreting results in half of the precious time of lecturers or participants early in the morning or late at night being wasted. Especially in the case of on-demand training (LMS, etc.), since this greatly detracts from the merit of being able to view contents repeatedly (time is wasted each time the contents are viewed), especially on LMS, consecutive interpreting should be regarded as taboo. As specific countermeasures, the following can be considered.

- In real-time training, employ simultaneous interpreting as much as possible.
  - In webinars using Zoom, etc., features for simultaneous interpreters are supported (viewers can select the language they want to hear).
  - Even if there is no choice but to adopt consecutive interpreting, insert dubbing or subtitles to pre-recorded videos.

- In videos used in on-demand training, “dub” the contents into the local language as far as possible.
  - With subtitles, there is a risk that trainees will miss important contents because their attention is drawn to the subtitles.
  - However, from the viewpoint of accessibility, since preparing subtitles as an auxiliary means is also important, even when dubbing contents, subtitles should also be provided (as an option).

5.3.3 Necessary Operating Structure in JICA Headquarters

Considering that remote training will become a permanent mode of training in future, it is thought that the following kind of operating structure will be required on the side of JICA Headquarters.

(1) Remote handling of training management systems

In this Study, system contents are not being discussed, however, in the case where remote implementation becomes a permanent training option, it is thought that corresponding functions will also additionally be required in the training management system.

(2) Online training procedures

This also is related to (1), however, conventional procedures for face-to-face training will also become less labor-intensive and simpler through adopting online implementation in future. For example, it is thought that it will become possible to submit A2 and A3 forms online, conduct inputting of said forms online, automatically send the inputted information to the training management system and JICA-VAN, and also conduct other procedures semi-automatically by online systems.

6. Plan for Improvement of the ICT Environment for Remote Project/ Activity Implementation

In this chapter, based on responses to issues in the remote implementation of Projects/Activities as described in Chapter 3 and the results of the Demonstration Surveys (PoC) described in Chapter 4, the plan for improving the ICT environment necessary for remote implementation of Projects/Activities in JICA Overseas Offices and C/P agencies is described below.

6.1 Plan for Improvement of the ICT Environment in JICA Overseas Offices

6.1.1 Plan for Improvement of the ICT Environment in Projects/Activities

(1) Preparation of ICT Environment Guidelines for Implementation of Projects/Activities for JICA Overseas Offices

In Projects/Activities implemented by JICA, preparation of the ICT environment is currently almost entirely addressed by the Office for STI and DX and departments in charge of the Projects/Activities, however, in Latin America and the Caribbean, it is difficult to provide real-time support due to the time difference; moreover, since many of the Projects/Activities are under the jurisdiction of JICA Overseas Offices and are often implemented on small-scale sites, the current situation is not adequate. Accordingly, prior to obtaining the support of the Office for STI and DX and departments in charge of the Projects/Activities, it is at least necessary to have some guidelines for establishing the ICT environment that is needed for implementation according to the discussions with the CP agencies and envisaged contents of the Projects/Activities when examining and forming the Projects/Activities. The following sections describe a proposal for such guidelines.

ICT Environment Guidelines for Implementing Projects/ Activities for JICA Overseas Offices (Draft)

① Grasp the main components of the target Projects/Activities

Grasp the components that comprise the intended Projects/Activities, and determine whether those components can be remotely implemented according to the following list. For example, even if the Project/Activity is Technical Cooperation, if its main components are classed as training or survey, “training” or “survey” should be selected from the following list rather than “Technical Cooperation”.

- Training
  → Examine the feasibility of remote implementation according to Demonstration Survey (PoC) 1 and Chapter 5
- Survey
  → Examine the feasibility of remote implementation in reference to Demonstration Survey (PoC) 2

Mainly acquisition and communication of information

- Technical Cooperation (other than training and survey)
  → Depends on the contents of technology (described later)
- ODA Grant/ ODA Loan
  → Examine the feasibility of remote implementation based on Demonstration Survey (PoC) 3

Objects are often involved

② **Extract the parts that entail acquisition, storage, communication, analysis and determination of information in Projects/Activities**

Among the main components that comprise the intended Projects/Activities, extract the parts that entail the processing of "information". This is done because the ICT environment is composed of technology, equipment and tools that are related to "information". Since "training" and "survey" directly involve the handling of information, they have high affinity with ICT. In contrast, since Technical Cooperation and ODA Grant/ ODA Loan projects other than training and survey often mainly entail activities related to objects (hardware) rather than information, determining what kind of ICT environment is needed is not easy and it is necessary to hear the opinions of experts in that field. In recent times, there are cases where ICT can be utilized due to the interaction of objects and information (E.g. machine tools, CNC, 3D printers, remote operation of machines, etc.). However, staff in JICA Overseas Offices, who are not experts in those fields, can roughly gauge the basic ICT tools by turning attention to activities where **communication of information** is the main activity (for example, monitoring of progress, etc.).

③ **Look at the type of information and direction and immediacy of communication**

Once that the information handled in the target Projects/Activities has been extracted, attention should be directed to the type of the information and the direction and immediacy of its communication, as is shown in the figure below.

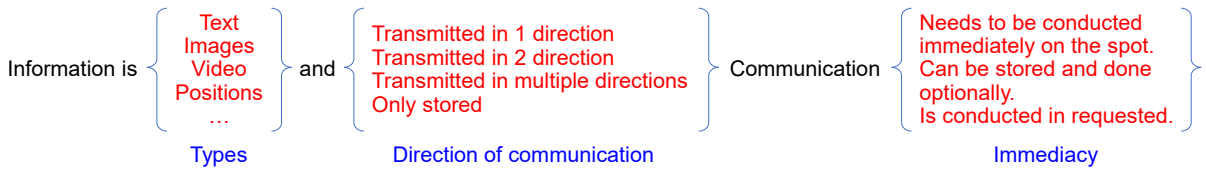


Figure-85 Grasping the Type, of Information and Direction and Immediacy of Communication

④ **Roughly identify the necessary ICT devices, solutions and tools**

Based on the type of the information handled in the target Projects/Activities and the direction and immediacy of its communication, it is possible to roughly identify the basic ICT environment as shown in the following table.

Table-63 Rough Guide to ICT Devices, Solutions and Tools Required for Projects/Activities

Immediacy / Direction of communication	Immediate communication	Save and communicate at an optional time	Save and communicate if requested
One-way	・ News distribution (text) ・ Live distribution (video, audio)	・ Text sending ・ Sending of images and video files ・ Sending of files	・ Server ・ On-demand distribution (LMS, etc.)
Two-way	・ Chat (text, images) ・ Call (audio) ・ Video call (video)	・ Chat (text, images) ・ File sharing ・ Answer phone	・ Communication between servers ・ System linkage based on API ・ Connection between sites
Multi-directional	・ Video meeting (video, audio) ・ Simultaneous editing (text, etc.) ・ Virtual space	・ File sharing ・ Database cluster	・ Communication between servers ・ System linkage based on API ・ Internet
Storage only	・ Log (text), database (various information)		

However, this table is primarily intended to help JICA Overseas Offices staff who have no ICT expertise establish the rough direction of the ICT environment, and it should be remembered that more detailed examination will subsequently need to be conducted with experts in the field, the Office for STI and DX, and the department responsible for the Project/Activity concerned.

(2) Examination and procurement of equipment and tools that can be shared in multiple Projects/ Activities

Based on the results of hearings and questionnaire surveys conducted in this Study and the experience gained from implementing the Demonstration Surveys (PoC), it is thought that ICT equipment and tools in the following fields can be shared in JICA Projects/Activities (i.e. it is possible to use common ICT equipment and tools in multiple Projects/Activities).

- VR (simulation) as an alternative to hands-on experience and practical learning in training Projects/Activities
- Remote site survey (similar to Demonstration Survey (PoC) 2)
- Remote monitoring of Project/Activity sites (Demonstration Survey (PoC) 3)

In other words, it is considered effective to stock ICT equipment and tools that have wide applicability and can be used in Projects/Activities covering multiple differing fields in JICA

Overseas Offices and lend them out to individual Projects/Activities, thereby realizing utilization without any wastage.

① VR as an alternative to hands-on experience and practical learning in training Projects/ Activities

As was described in Chapter 5, remotely implementing hands-on experiences and practical learning in training is often nowhere near as good as actual experience in terms of the training effect. Even so, to remotely enhance effectiveness as much as possible, VR technology, which offers simulated experiences to trainees, is considered to be useful. There are various types of VR/AR technologies, however, the easiest to achieve and most universal is thought to be showing trainees videos or still images shot by 360-degree camera (see section 5.2.8 (4) and the following figure).

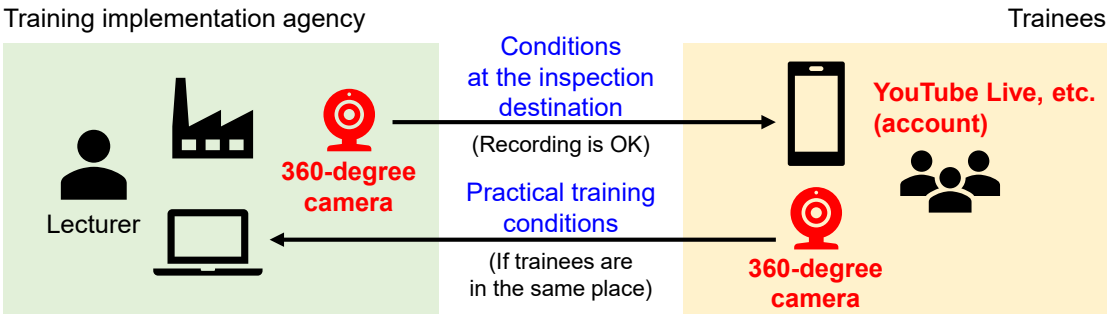


Figure-86 Simulated VR based on 360-degree Camera

Specifications of the type of 360-degree camera used for such purposes are as follows.

- Field of view: 360 degrees (all-around)
- Size of images: Roughly 4K (3840 x 2160)
- It is possible to easily upload the shot all-around videos to an online video service such as YouTube, etc. that supports such videos.
- Similarly, it is possible to distribute all-around videos in real-time.
- Reference model: Ricoh Theta Z1

② Remote site survey

Remote implementation of site surveys is an activity conducted in various Projects/Activities. As was described in 4.3 concerning Demonstration Survey (PoC) 2, the ICT devices and tools commonly required for conducting remote site surveys are a smartphone surveying app (for acquiring information), a cloud database (for saving information), and a dashboard/BI (for analyzing and displaying information). See 4.3 (6) for the specific specifications of tools and reference models.

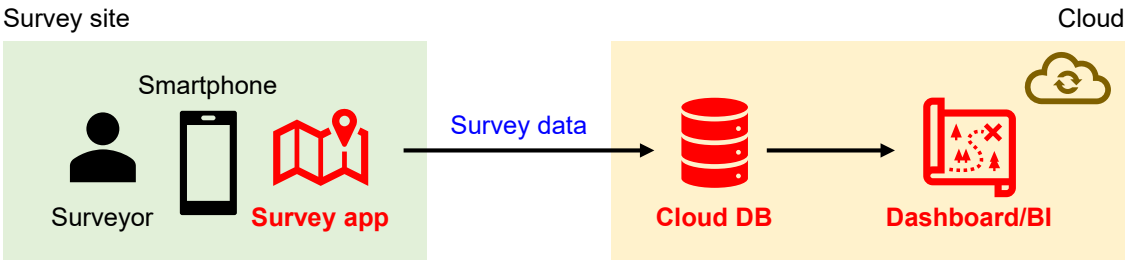


Figure-87 Devices and Tools that can be Commonly Used in Remote Site Surveys

③ Remote monitoring of Project/Activity sites

Since remote monitoring of progress on Project/Activity sites is almost always done in ODA Grant/ ODA Loan settings and is also common in Technical Cooperation settings, it is a universal activity. As was described in 4.4 concerning Demonstration Survey (PoC) 3, the universal ICT devices and tools required for conducting remote site monitoring are smartphones (for acquiring information and conducting two-way communications) and/or wearable cameras (for acquiring information). See 4.4 for the specific specifications of tools and reference models.

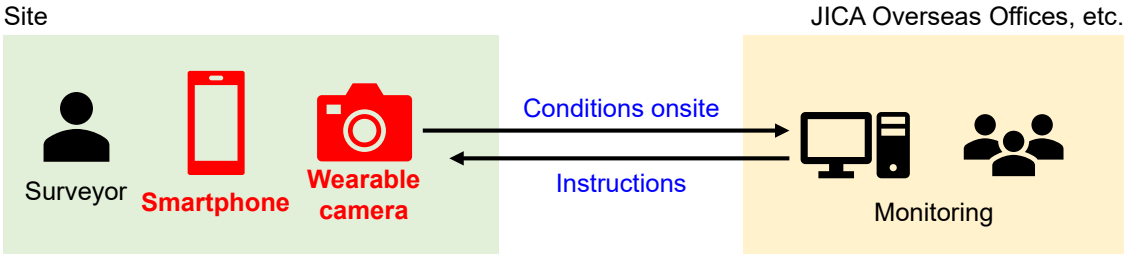


Figure-88 Devices and Tools that can be Commonly Used in Remote Site Surveys

6.1.2 Plan for Improvement of the ICT Environment in Terms of Organizational Structure

(1) ICT support structure for overcoming time difference with Latin America and the Caribbean

The greatest wish by JICA Overseas Offices revealed in this Study was for an ICT support structure capable of overcoming difficulties arising from the time difference with Latin America and the Caribbean. Due to the time difference, it is not possible to utilize the helpdesk in JICA Headquarters in real-time, so advice cannot be immediately given when ICT problems arise. As is described in the following section, there is a major gap between the current approach adopted by Headquarters and the wishes of people on the ground. For staff in JICA Overseas Offices, since there is an urgent need to address this issue, as is shown in the following figure, it is necessary to draw a roadmap starting from measures that can be implemented immediately, then phase in countermeasures in both the JICA Overseas Offices and JICA Headquarters, and finally adopt measures that are applicable to JICA Overseas Offices around the world.

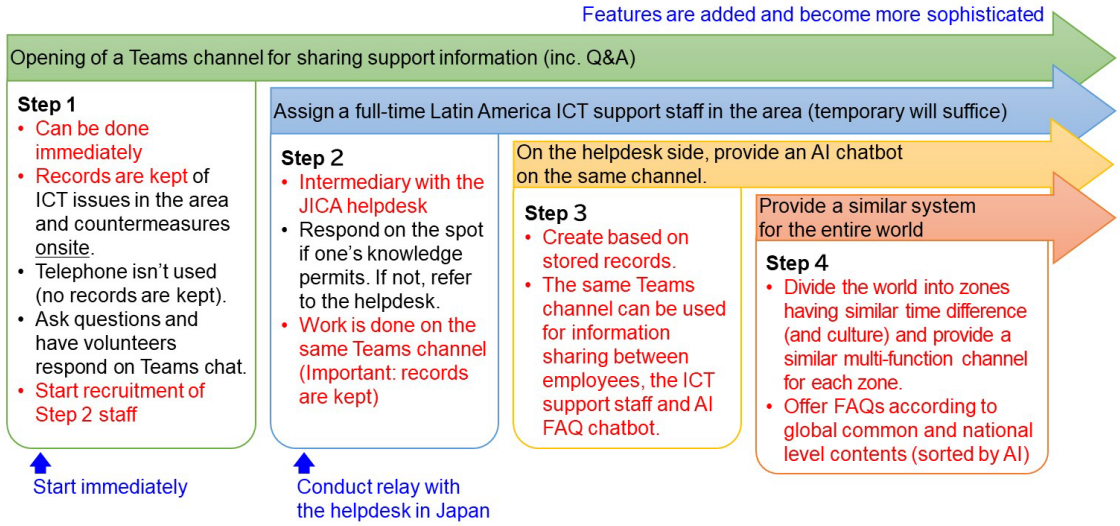


Figure-89 Roadmap for Construction of an ICT Support Structure to Overcome Time Difference

In the figure, particular emphasis is placed on the fact that "records are kept". That is because digital records are data, which means that large quantities can be stored and analyzed for application of the latest technologies such as data science, AI, etc. Moreover, the following table indicates the cost effectiveness of each step.

Table-64 Cost Effectiveness of Steps for Building the ICT Support Structure to Overcome Time Difference

Step	Cost Effectiveness
Step 1	・ No cost is incurred (it can be implemented with existing infrastructure and human resources. ・ This step alone has limited effectiveness, however, it is possible to save data that can be utilized in later steps. ・ It is necessary to change awareness so that inquiries that were conventionally made by telephone are made via chat. ・ As an option, it is possible to combine a function for audio inputting to the chat field. Especially on the latest models of smartphone and PC, such a feature is equipped as standard.[30]
Step 2	・ Human resources costs are incurred in recruiting new support personnel. ・ If personnel who are endowed with the necessary knowledge and skills can be recruited, an extremely large effect can be obtained. Among the 4 steps proposed here, cost effectiveness is the largest step. ・ It is envisaged that frequency of use by staff of JICA Overseas Offices will be extremely high.
Step 3	・ It is envisaged that a lot of expense (a few million yen) will be incurred in developing AI chatbots, etc. (cost of training based on data) (it is envisaged that development will need to be outsourced). Also, this step should be designed with a view to proceeding to Step 4 in the future. ・ The effect will greatly depend on the quantity and quality of saved data and the method of its analysis, however, it is anticipated that over-concentration of workload on the support staff recruited in Step 2 will be mitigated, while the accuracy of the AI will continue to improve.
Step 4	・ If Step 3 can be cleared, it is thought that additional development costs will not be so high. The most costs will be incurred in saving the volume of data and ensuring the processing speed for responding to worldwide zones, however, if recent cloud resources are used from the start, it will be possible to scale-up the service. ・ If effects can be confirmed in Step 3, it is anticipated that effects will also be obtained in Step 4.

[30] https://support.microsoft.com/en-us/windows/use-voice-typing-to-talk-instead-of-type-on-your-pc-fec94565-c4bd-329d-e59a-af033fa5689f

Here, it is assumed that the chat function of Microsoft Teams will be used, however, as was stated in section 5.2.8 (2), Teams is not simply a software for online meetings and chat, but rather it has the potential to become a central platform for interlinking various work and systems. Accordingly, Teams should be examined from the perspective of widely utilizing not only as an ICT support system but also for linking with the standardization and automation of work processes described in section (4).

(2) Assignment of dedicated ICT support staff for Latin America and the Caribbean

In a matter that is closely linked to the preceding section, in Latin America and the Caribbean, it is difficult for offices to receive timely support from the helpdesk at JICA Headquarters due to the time difference; in addition, because there is still an extremely large gap between the local ICT literacy envisaged by the Headquarters side (Information Systems Department, etc.) and the actual conditions, it is thought that some form of ICT support staff assignment will be urgently required to act as a bridge between JICA Headquarters and the local offices. The following figure shows the current gap related to the ICT support structure and the type of human resources required to fill it.

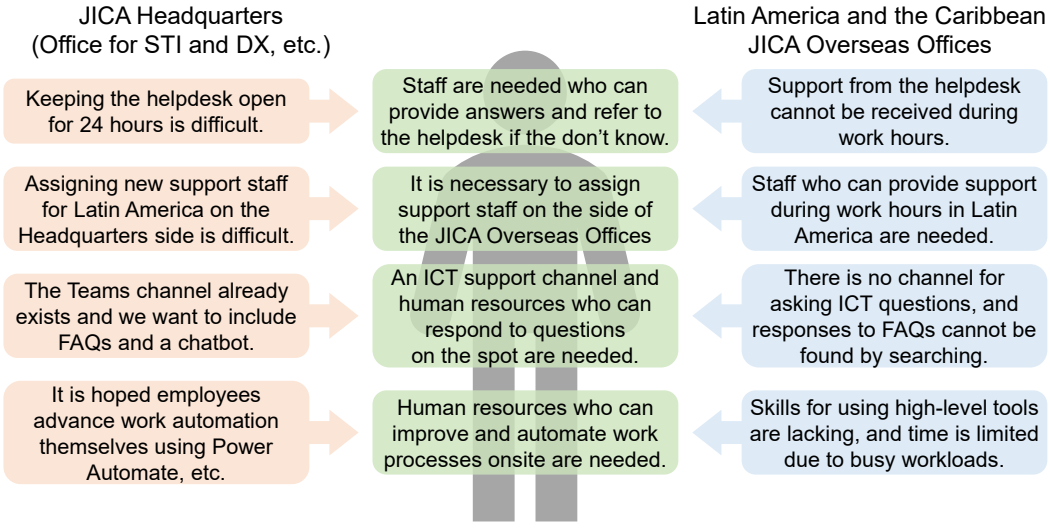


Figure-90 Gap concerning ICT Support Structure in Latin America and the Caribbean and the Type of Human Resources for Filling it

To fill such a gap, the draft TOR of the ICT support staff deemed to be urgently needed in Latin America and the Caribbean is indicated below.

Table-65 Draft TOR of Dedicated ICT Support Staff for Latin America and the Caribbean

Item	Draft TOR
Number of persons	・ 1 person for Latin America and the Caribbean (starting from 1 person, the number may be increased according to necessity while monitoring the volume of work, etc.)
Form of employment	・ Since it is difficult to recruit in Headquarters, to prioritize speed of recruitment, it may be better to recruit for a limited period in a JICA Overseas Offices.
Linguistic ability	・ Ability to adequately read and write in Japanese and Spanish is required. ・ If possible, ability in Portuguese and English is also desirable.
Work experience and skill	・ Work experience of 1 year or more in professional ICT systems support in a non-ICT company (general office) (essential) ・ Experience of being involved in programming (including macro and RPA) in work (language not questioned) ・ It is preferable to have experience of work process automation based on VBA, RPA, Microsoft Power Automate, etc.
TOR	・ Basically, this support staff will represent the JICA Headquarters helpdesk concerning ICT during work hours in Latin America and the Caribbean. ・ He/She will conduct ICT support work for users in JICA Overseas Offices. ➢ He/She will take charge of the helpdesk (for the target area) established on the Teams channel for sharing support information in Latin America and the Caribbean. ➢ He/She will give text responses to all questions from users on the chat feature of the above channel (to leave a record). ➢ He/She will immediately respond to questions that he/she can answer based on his/her technical knowledge, or questions that were previously asked in the past. If there are questions he/she cannot answer (especially questions about systems on JICA net), he/she will transfer them to the JICA Headquarters helpdesk and post the answers in the chat feature. ➢ If similar questions are received from multiple users, he/she will collate them and edit them in technical simple format for the helpdesk. ➢ He/She will obtain manuals and support information regarding applications in the JICA network (upon securing NDA if necessary), implement support based on the contents, and try to respond to questions from users on the spot as much as possible. ・ He/She will sort questions from users and saved data on responses. ➢ He/She will cooperate with the Information Systems Office to create and update FAQs based on the saved question and answer data. ・ Based on the support history, he/she will extract work processes that particularly entail a lot of issues in work involving Latin America and the Caribbean and promote the automation of work utilizing Power Apps, Power Automate, etc. while liaising with the Information Systems Department in Headquarters. ➢ For example, mass sending of emails to trainees, etc.

(3) Improvement and standardization of IT literacy of national staff and employees

Based on the results from implementing Demonstration Survey (PoC) 4 (4.5) and the results of the ex-post questionnaire, etc., the following current conditions and issues were revealed concerning the IT literacy of employees and national staff in JICA Overseas Offices.

- Work is too busy to have enough time for improving IT skills.
- Staff want to learn practical skills they can use immediately in work.

} Same cause

- Meanwhile, basic IT knowledge (information systems and information security) and IT literacy (not only improvement of skills but also manners and etiquette) are also important.
- To improve motivation, measures that are directly linked to evaluation, such as qualification systems, are needed.

In view of these facts, it is necessary to consider ICT literacy from the 2 following viewpoints.

1. What kind of literacy is immediately required (in routine work)?

   ➢ Skills that can be immediately used on sites

   → Is it really necessary to learn such skills?

   ➢ Operating methods for the IT tools necessary to work are complex.

   → Operating methods should not be learned, but rather, aren't they the responsibility of the side that makes such difficult tools?

2. Long-term viewpoint (Adapt to work in the future DX age. Examination of qualification systems, etc.)

The following figure shows the roadmap for improving ICT literacy in consideration of these viewpoints.

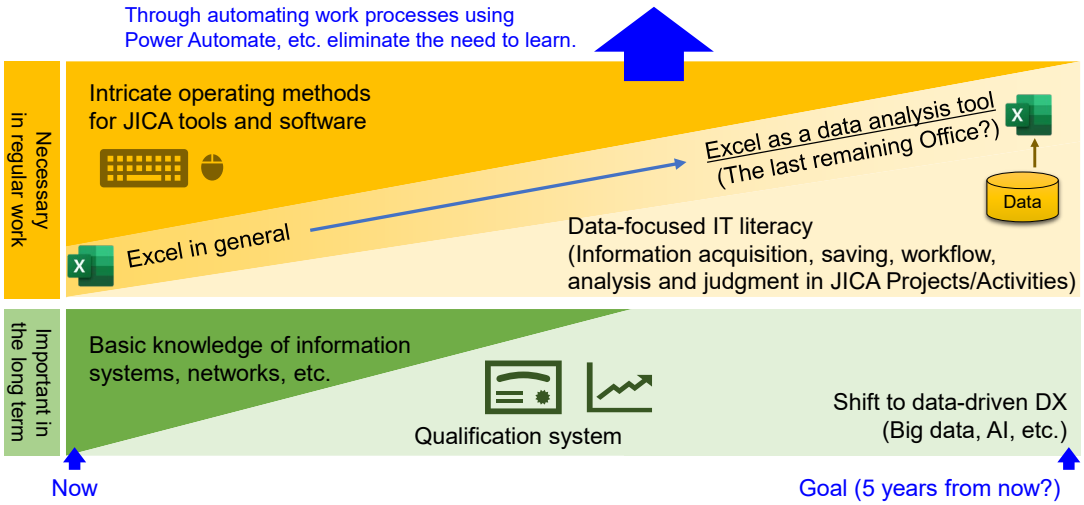


Figure-91 Roadmap for Improving IT Literacy among National Staff and Employees

First, concerning the literacy that is required in regular work, as may be gathered from the results of Demonstration Survey (PoC) 4, in which there was found to be a strong demand for tips on Excel, Windows, etc., there is desire to "even a little, mitigate the current busy workload of regular work that is complicated and time-consuming". Such tips, etc. are not essentially vital for work; in other words, staff wish above all to be able to process their work without having to conduct so many troublesome and complicated operations. Therefore, regarding the true form of ICT literacy, rather than learning operating methods without changing current work processes, it is more advisable to simultaneously improve work processes so that unessential operations are eliminated, and then only learn the important literacy that remains after doing this.

Moreover, concerning literacy that needs to be acquired from the long-term viewpoint, it is currently recommended that staff acquire qualifications such as the IPA's IT Passport Examination[31] related to basic knowledge such as information systems, networks, etc., however, as more and more work processes and tools are switched to cloud and data-driven DX advances from now on, it is highly likely that learning about the basic infrastructure and technologies that underpin those things will cease to be so essential (for general office workers).

Accordingly, it is surmised that the literacy required in the future GX age will shift to data-driven ICT literacy (how to acquire, save, analyze and determine information in JICA Projects/Activities). Concerning Excel, too, it is thought that its features as a tool for analyzing data will essentially become more important. In line with this, it is likely that staff will need to learn the basics of new technologies such as big data and AI that will inevitably need to be adopted in office operations.

(4) Standardization and automation of work processes (or outsourcing)

As was described in the preceding section, it is necessary to improve the ICT literacy of staff in JICA Overseas Offices in tandem with the standardization and automation of work processes on the systems side. For general users, the UI (user interface) they directly operate represents ICT in its entirety, and they are not concerned about the inner workings of systems. Therefore, work efficiency can be improved by enhancing the quality of this interface.

Standardization of work processes

1. First, compile a list of current SOP (Standard Operating Procedures) and work operations in JICA Overseas Offices.

   This does not need to be compiled for all procedures in all work processes; rather, it need only be compiled for the regular work operations in JICA Overseas Offices that are troublesome and time-consuming, entail complex procedures, and arise frequently. The important thing here is to write down all the procedures that are needed to implement such work operations: for example, all necessary tasks in the UI such as switching and downsizing the application window, clicking the mouse and so on should be written down as essential.

2. From the compiled list, extract the operations that can be standardized. For example, any tasks that are extremely complex and entail many complicate procedures and tasks that entail non-essential operations such as temporarily exiting a screen or taking written notes are candidates for standardization.

[31] https: //www3.jitec.ipa.go.jp/JitesCbt/index.html

Standardization of work process

1. In the standardization process, out of the operations that are necessary for the target work, conceal from users all those that are non-essential. For example, if "data inputting" is the only essential operation, all other operations should be standardized as far as possible.

2. Standardization should not be confined to applications, macro and RPA, but rather be implemented for the entire "work process" as far as possible. Caution is required because, if use of RPA, etc. is limited to individual employees and national staff members, the standardization will stop at individual work and not contribute to higher work efficiency over the entire organization. The following table displays differences in these standardization tools.

Table-66 Types of Work Standardization Tools and Their Differences

Tool	Description	Examples
Macro	A system within a single application (or between multiple related applications) where a program writes and automatically executes operations normally performed by humans. For example, automatically conducting the procedure for "reading external data to create and print a graph on Excel".	VBA (Visual Basic for Application), etc. installed in Microsoft Office
RPA	A system for recording or writing and automatically executing as a program almost all the operations that a single user performs on a PC screen. Targets may include combinations of any applications. For example, "reading a list of trainees from the training management system and sending a file attachment to each individual member".	Microsoft Power Apps, UiPath, etc.
Work process standardization tools (BPMS, workflow systems)	System for standardizing work processes related to multiple users and tools. For example, standardizing "the process for drafting, requesting decision and approving an application for leave". When the applicant inputs the necessary items on the drafting screen, the request for decision is automatically circulated and eventually automatically reaches the manager for approval or rejection and so on.	Microsoft Power Automate, Kintone, etc.

If such standardization is advanced, ideally, the necessary ICT literacy will be crystallized in the staff of JICA Overseas Offices as essentially necessary operations and knowledge. The following figure shows the essential changes in ICT literacy based on such work process standardization.

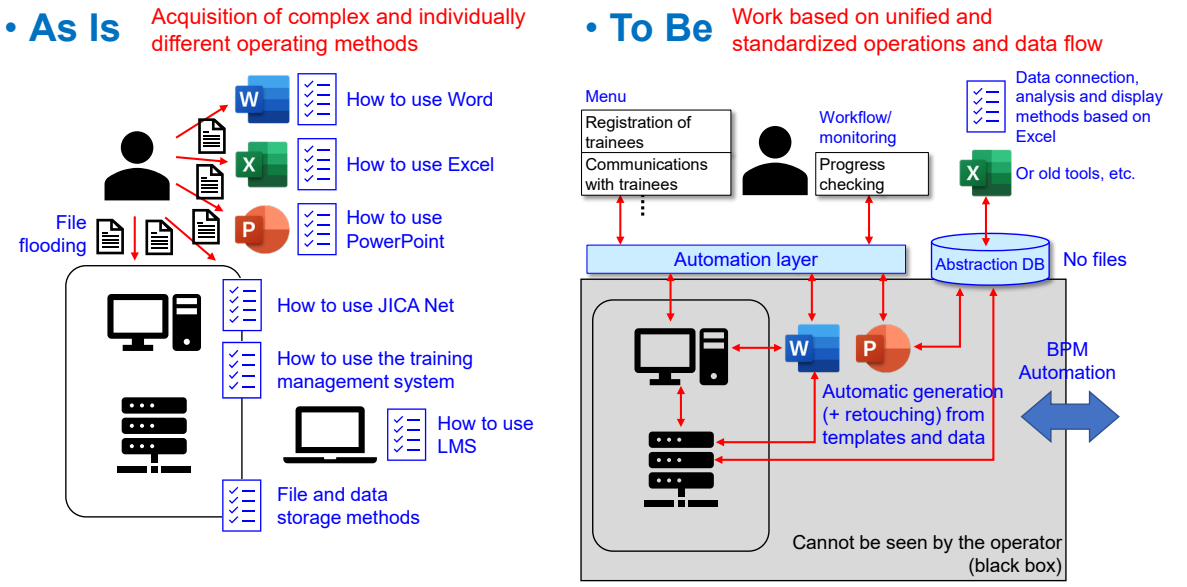


Figure-92 Essential Changes in work ICT Literacy based on Work Process Standardization

However, when advancing such standardization, caution is needed concerning the method of use of RPA (Power Apps, etc.). Since RPA is basically a tool for standardizing individual work, if each staff member freely implements standardization of work, not only will many RPA for conducting similar tasks all over the world be disorderly established, but all members must standardize similar work from the beginning, meaning that there will be much redundancy and wastage in the RPA creation work.

Accordingly, standardization of the type of tasks that are commonly required around the world should not be conducted on the individual level, but rather a system should be introduced for creating and sharing over the entire organization. Specifically, it is desirable to create a channel for discussing wishes for operations and tasks that want to be standardized, select universal tasks by means of voting, etc., and having employees skilled in RPA creation and the Latin America ICT support staff, etc. described earlier create the RPA “at cost”. Concerning the reason why, even if problems should occur, the persons that created the RPA can take the responsibility to perform maintenance on the script, etc.

Concerning outsourcing of work processes

Generally, from the viewpoint of considering work DX, it is thought that promoting the digitization and automation of work processes is the correct course to take, however, for work processes that are not specific to JICA but rather are generic work processes conducted by general enterprises and government agencies (for example, general affairs, personnel affairs, accounting affairs, general data inputting and outputting, call center for general customers, etc.), another option is to outsource such work to an external specialist company (BPO: Business Process Outsourcing). The more generic that work processes are, the greater is the cost effectiveness of the outsourcing. That’s because, since the outsourced company specializes in the work concerned, it is more advanced in terms of work efficiency and can realize cost cutting based on merits of scale.

6.2 Support for Building of ICT Environment in C/P Agencies

6.2.1 Support for Building of ICT Environment in Terms of Projects/Activities

(1) Support for selection of general ICT devices and tools

When conducting support for introducing ICT devices and tools, etc. related to JICA Projects/Activities to C/P agencies, if they are intended for use in JICA Projects/Activities, it is possible to select using the method described in 6.1.1. If the ICT devices and tools, etc. are not intended for use in Projects/Activities, basically, it is only necessary for JICA to give advice, but if the ICT literacy needed to select equipment is lacking in both the C/P agency and JICA Overseas Office, it is possible to make a rough selection by following the same procedure as described in 6.1.1. However, as was described in 6.1.1, when compiling concrete specifications and conducting procurement, support must be obtained from an expert in that field or an ICT specialist. It should be noted that there is no general-purpose manual for enabling persons who are not well-versed in ICT to select ICT equipment (if such a manual did exist, there would be no need for systems engineers and systems integrators).

(2) Conditions for using JICA-VAN in third country training

In Demonstration Survey (PoC) 1, Cornerstone, which is the JICA-VAN LMS used in third country training, was not used, but rather a separate LMS was adopted upon consulting with the C/P agency. When using JICA-VAN in third country training, since a third country agency is the training implementation agency, a certain degree of caution is required compared to the case where a Japanese organization is the implementation agency. The required conditions for using JICA-VAN in third country training are as follows.

- Cases where it is conditional that JICA-VAN be used from the start of the planning stage. Since the training is implemented by JICA at JICA's expense, it is natural that the training be planned based on such a condition. However, needless to say, this cannot be realized unless the counterpart agency gives its consent.
- If JICA possesses the copyright to contents, considering the management of such copyright, JICA-VAN should basically be used.

Conversely, use of JICA-VAN is considered difficult in cases such as the following.

- Cases where the counterpart agency already uses a separate LMS and it owns copyright to the training contents. This is the exact opposite of the above cases and it is deemed only natural that the counterpart's LMS be used. If it is still preferred to use JICA-VAN in spite of these conditions, it is necessary to obtain consent from the counterpart to use its copyrighted contents. Moreover, if the said contents are not SCORM format but rather a unique format intended for the counterpart's LMS, switching the contents to a format that can be used on JICA-VAN is likely to be costly. Therefore, the counterpart's LMS should be used.

6.2.2 Support for Building of ICT Environment in Terms of Organizational Structure

It is rare for support to be provided for the building of ICT environment in terms of organizational structure in C/P agencies outside of JICA Projects/Activities. One such example may be the case where the staff of a C/P agency request JICA to provide support for improving the ICT literacy of its staff. If this is required in relation to a JICA Project/Activity, there may be room to consider it, however, it is usually something that the said agency needs to address independently. The JICA side may provide advice or introduce examples of initiatives adopted in JICA as described in 6.1.2 (3).

7. Recommendations

It is thought that online activities will continue even after the COVID-19 pandemic dies down, so it will be necessary to advance Projects/Activities based on a hybrid approach combining remote and face-to-face methods. In this chapter, the issues facing remote implementation of JICA Projects/Activities and measures to address them are summarized with a view to presenting a bird's-eye view of the overall picture. When examining the remote implementation of Projects/Activities in Latin America and the Caribbean, it is envisaged that readers will find applicable items here and confirm the contents given in each chapter based on the reference information indicated.

7.1 Recommendations the Training Remote Implementation Structure

7.1.1 Basic Thinking concerning Remote Training

- Basically, remote implementation should only be regarded as one method for implementing training, and its partial utilization should be positively examined while considering cost effectiveness, etc. (→ 5.1)
- Upon doing that, first, without considering implementation methods (it is important to consider implementation methods later), start from analyzing the training issues from the perspective of Instructional Design and setting the training goals and level of attainment for trainees, and then decide on the training contents and syllabus (composed of multiple training items) for attaining those goals. (→ 5.2.1)

7.1.2 Items to be Examined in the Training Implementation Preparatory Stage (when creating teaching materials, etc.)

- Once that training contents have been decided, the intended training items are grouped according to time difference and mode of training, and examination is conducted to determine whether each item can be remotely implemented, while also considering the cost effectiveness (→ 5.2.2-5.2.5). When doing this, if it is envisaged that the internet environment is poor, detailed examination is conducted according to section 5.2.6.
- As a result of examination, concerning the training items to be implemented remotely, the ICT tools to use are decided (→ 5.2.7) and training teaching materials that use such tools are created (→ 5.2.8); then, the training is implemented remotely (or in hybrid form with face-to-face training in many cases) (→ 5.2.9).

7.1.3 Necessary Structure According to each Training Stakeholder

This has already been recommended in 5.2. The following section summarizes the structure that should be established according to each party.

(1) Trainees

- Assuming that it is common for remote training to be included (albeit partially) in all of the component elements of the training, the GI distributed to trainees should specify the preparations and methods that need to be implemented on the trainee side to receive remote training. (See 5.3.1 (1))

(2) JICA Overseas Offices

- Listing of local locations (hotels, etc.) equipped with a remote training environment (→ 5.3.1 (2))
- Establishment of a system for subsidizing data charges for trainees who only have mobile lines (→ 5.3.1 (3))
- Listing of operators who can locally produce teaching materials (LMS teaching materials) for on-demand training (→ 5.3.1 (4))
- Creation of a response flowchart for when trainees have questions (→ 5.3.1 (5))
- Creation of a permanent channel used for remote training-related inquiries and communications (→ 5.3.1 (6))

(2) Training implementation agency/Contracted agency

- Establish the basic policy for addressing the time difference (→ 5.3.2 (1))
- Construction of a curriculum structure and syllabus suited to remote training (→ 5.3.2 (2))
- Handling of copyright for online teaching materials (→ 5.3.2 (3))
- Establishing a structure for enabling training based only on the local language (→ 5.3.2 (4))
- However, if an agency in the counterpart country is the implementation agency as in the case of the Third Country Training Program (TCTP), the issue of whether the counterpart agency can be asked to conduct all of the structural preparation described above will depend on the contents that are agreed between JICA and the said agency. Moreover, a little more care is needed when conducting on-demand training using JICA-VAN. (→ 6.2.1 (2))

(4) JICA Headquarters

- Remote handling of the training management system (→ 5.3.3 (1))
- Online provision of training procedures (→ 5.3.3 (2))

7.2 Recommendations concerning the Remote Implementation Structure in Technical Cooperation/ODA Grant and ODA Loan

7.2.1 During Project/Activity Formation

Once the cooperation contents of the Project/Activity have been established, the ICT environment required to implement the Project/Activity should be roughly defined according to the ICT Environment Guidelines for Implementation of Projects/Activities for JICA Overseas Offices (see 6.1.1 (1)). Moreover, if it is clear that the Project/Activity includes remote training, site survey, progress monitoring and other activities, the equipment required for remote implementation should be selected while referring to the respective examples of the Demonstration Survey (PoC) (→ 4.). In cases where it is envisaged that the same kind of structure and monitoring setup will be adopted for multiple Projects/ Activities, rather than individually procuring ICT equipment according to each Project/ Activity, it is desirable also from the viewpoint of cost effectiveness to prepare in advance equipment and tools that can be shared between the JICA Overseas Offices concerned (→ 6.1.1 (2)). When forming Projects/ Activities, even if budget is limited, work can be advanced assuming utilization of such equipment and tools.

In any case, it is necessary to have an ICT expert and an expert in the Project/Activity field concerned confirm the remote implementation structure when conducting detailed design. In that case, it is also possible for the ICT expert to also serve as an ICT support staff member (→ 6.1.2 (2)) dedicated to Latin America and the Caribbean.

7.2.2 During Project/Activity Implementation

If the activities included in a Project/Activity are similar to cases (remote training, site survey, progress monitoring, etc.) from the Demonstration Survey (PoC), work should be implemented while referring to Chapter 4 of this report.

If the C/P agency, etc. requests equipment supply during the Project/Activity, as is indicated in section 6.2.1 (1), as at the time of Project/Activity formation, the equipment should be roughly identified based on the ICT Environment Guidelines for Implementation of Projects/Activities, and then the ICT support staff member for Latin America and the Caribbean and other ICT experts should prepare the detailed equipment specifications, etc.

Moreover, although there are not many cases where support is provided for ICT environment building in C/P agencies outside of JICA Projects/Activities, it may sometimes be possible for the measures described in section 6.2.2 to be taken.

7.3 Recommendations concerning Improvement of the Organizational Structure and ICT Environment in JICA Overseas Offices

In the course of the Study, the Study process was frequently shared with stakeholders (→1.2.4). Through webinars, report meetings, checking of materials, etc., various persons related to JICA said that their understanding of ICT utilization steadily improved. By having awareness of opportunities for contact with information and making numerous such opportunities available in the region, it is thought that the ICT support structure and ICT literacy of JICA Overseas Offices will steadily be enhanced. Rather than simply conducting survey, through consulting closely with stakeholders in that process, the following recommendations will be made.

(1) ICT support structure for overcoming time difference with Latin America and the Caribbean

As was described in 6.1.2 (1), since this is what people on the ground wish for more than anything else, work should be started from the things that are immediately feasible. Out of the 4 steps indicated in section 6.1.2 (1), Steps 1 and 2 are relatively easy to implement, whereas Steps 3 and 4 are not so simple and entail actual system development, so implementing will require ample preparation (including past support records) and budget measures.

(2) Assignment of dedicated ICT support staff for Latin America and the Caribbean

These are the human resources and structure that are most needed in this Study. Moreover, since there are advantages in having such staff on the JICA Headquarters side too (mitigation of support problems for Latin America and the Caribbean), such a structure should be realized as quickly as possible.

(3) Improvement and standardization of IT literacy of national staff and employees

As was described in 6.1.2 (3), since the contents of required IT literacy in employees should evolve according to development of the organization's ICT environment and DX structure, no single staff training of fixed contents should be implemented for years. The standardization and automation of work processes described below and improvement of IT literacy of employees indicated here are mutually linked; therefore, the need for training will in some cases be eliminated if automation relieves staff of the need to implement work themselves. However, in staff training that immediately needs to be implemented without waiting for the improvement and standardization of work processes, it is adequate for contents to comprise "immediately useful" tips like the training items cited in Demonstration Survey (PoC) 4. However, it should be remembered that such contents must evolve in line with the automation standardization of JICA work processes.

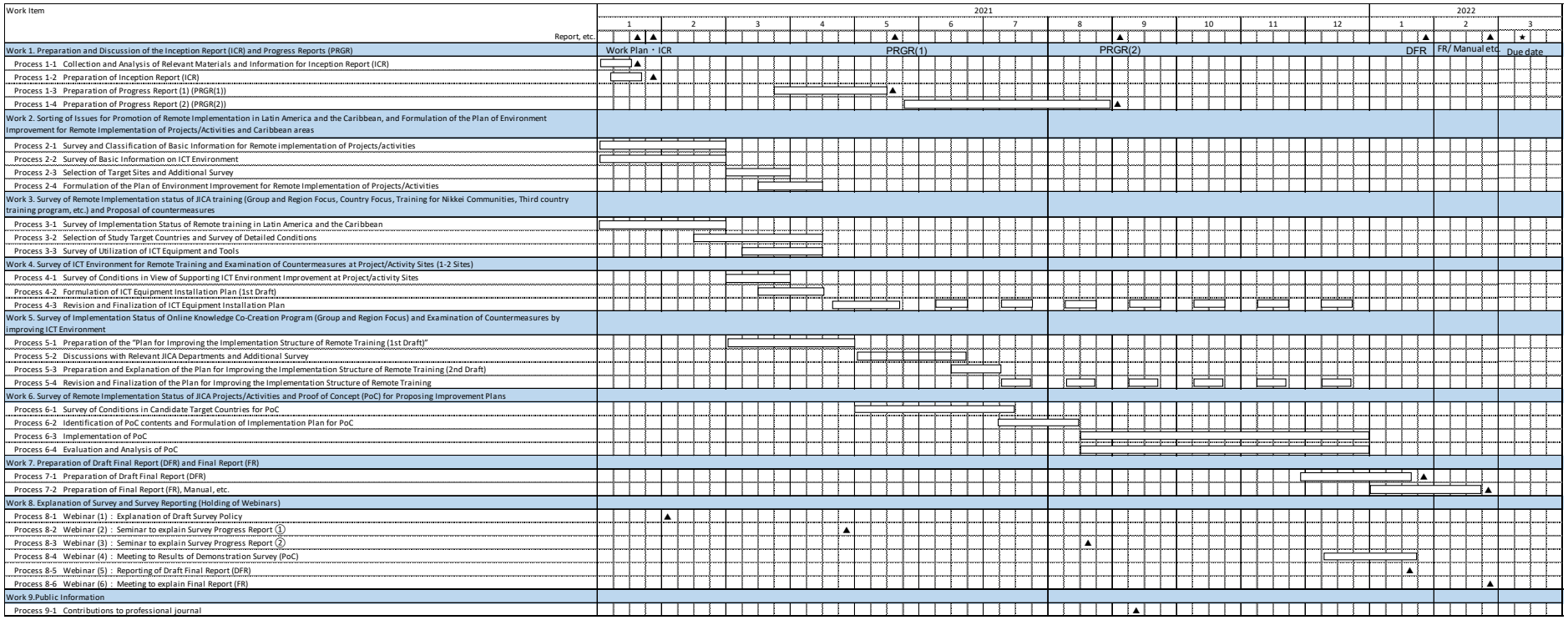
(4) Standardization and automation of work processes

As was described in 6.1.2 (4), since the staff who conduct actual work in JICA Overseas Offices best understand the needs for standardization and automation of work processes, their opinions

should be fully reflected in the contents. The ideal situation is for staff members who recognize needs to execute the standardization and automation of work processes, however, staff who possess the necessary skills for this are very limited. Moreover, if each member creates automated processes for his or her own work, it is possible that confusion will arise with multiple similar processes being established to conduct the same work. Therefore, it is desirable for the ICT support staff member for Latin America and the Caribbean to listen to the needs of staff and assist in creating common automated processes that can be used by all members.

APPENDIX

Appendix 1: Work Plan (revised December 2021)



Appendix 2: LMS Utilization Guidelines

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LIST OF FIGURES AND TABLES

(Figures)

(Tables)

We have prepared the following guide for introducing and selecting a LMS and creating teaching materials and contents for use on the LMS when utilizing such systems for the remote implementation of training. In the figure, the numbers against a black background refer to the corresponding section numbers in each chapter.

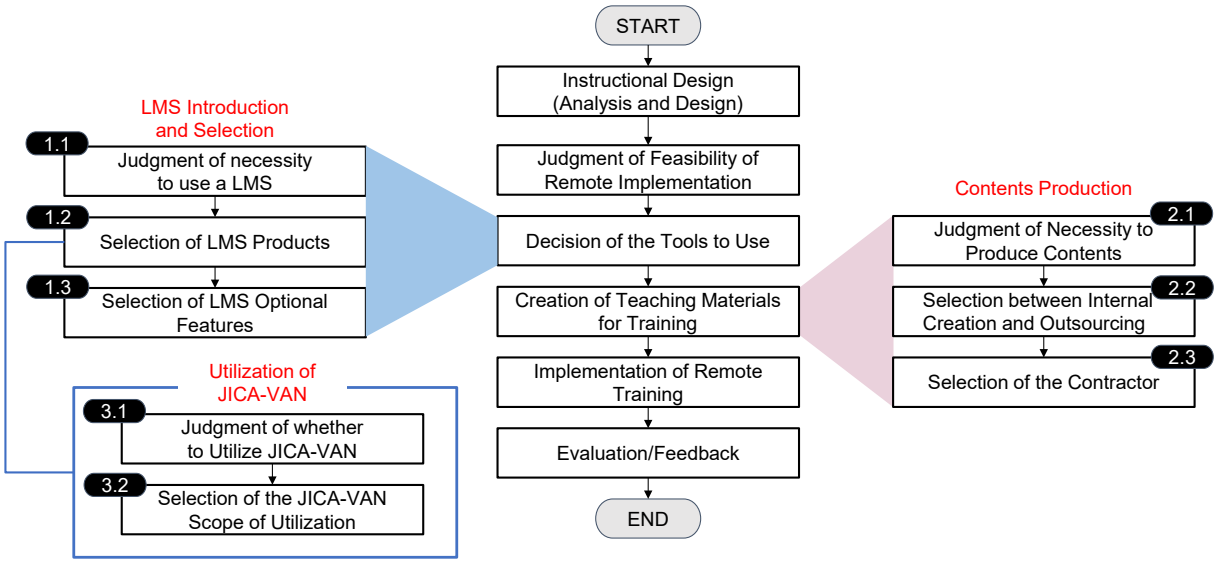


Figure-1 Composition of LMS Utilization Guidelines

1. LMS Introduction and Selection

After the decision has been made to conduct remote implementation of training, viewpoints have been sorted as follows for examining whether it is necessary to use a LMS in the training (1.1), selecting the LMS (1.2), and selecting the features (1.3).

1.1 Judgment of necessity to use a LMS

When introducing and selecting a LMS, it is first necessary to determine whether the LMS is really necessary. LMS is a work system for implementing training, but an operating structure for executing work is essential. Moreover, depending on the training being provided, a LMS is not suitable in some cases, for example, there are many cases where training comprises one-time-only real-time lectures. Other major factors that determine whether or not it is necessary to use a LMS are: whether there are LMS vendors capable of providing the necessary support in the country, and whether a stable network environment can be used for a reasonable cost in the country or region concerned.

The following table summarizes the conditions and thinking for determining whether or not it is necessary to use a LMS. Just because conditions are not always met does not absolutely mean that LMS cannot be adopted, however, these conditions can indicate whether use of a LMS is suitable (◎) or unsuitable (△). This is a tool for examining important conditions without missing anything, and if there are any conditions that make a LMS unsuitable, this table may be used as a tool for considering

countermeasures (for example, strengthening and improving the structure, revising the training contents, methods, etc.).

Table-1 Judgment of Necessity to Use LMS

Major item	Minor item	Conditions (Rough guide)	LMS compatibility/Description	
Operating structure	Person in charge of training	Assigned	◎	If a person in charge of training is assigned, LMS can be introduced smoothly. Operation of the LMS can be outsourced, but it will at least be necessary to have a person for liaising between the contractor and training implementation agency and overseeing the training activity.
		Not assigned	△	
Training plan	Continuity	Multiple times (3 or more)	◎	Continuous training is suited to provision through LMS because teaching materials can be repeatedly used. The operating load from the second time onwards can be mitigated by the LMS. Moreover, through storing, analyzing and improving data on the receiving of training, the next training can be made better.
		Once only	△	
	Training period	Long-term (2 months or more)	◎	In long-term training, because the workload of managing the progress and attendance history of trainees falls on the operator, the workload mitigation effect derived from introducing LMS is large.
		Short-term (less than 1 month)	△	
	Number of trainees	Many (50 or more)	◎	If there are many trainees, because the operator has more management work, the workload mitigation effect derived from introducing LMS is large.
		Few (less than 10)	△	
Training features	On-demand	Many (60% or more)	◎	A major feature of LMS is that learning can be conducted without being constrained by time, and this feature can be well leveraged in training that entails many on-demand teaching materials.
		Few (less than 20%)	△	
IT environment	Domestic LMS vendor	Yes	◎	Domestic vendors can more easily obtain support for introduction and operation. If there is no domestic vendor, it is necessary to find a local vendor, however, additional conditions are imposed such as linguistic support and so on.
		No	△	
	Network environment	Stable	◎	LMS is predicated on having a stable network between the trainees. If it is unstable, major constraints are imposed; for example, the LMS cannot be introduced, or videos cannot be distributed and so on.
		Unstable	△	

1.2 Selection of LMS Products

Since there are various types of LMS products, it often takes time to select the right one. The selection can be made more efficient by roughly narrowing down the potential products in the major category. Table-2 shows a guide for narrowing down the products. Here, methods are indicated according to the following 4 categories.

(1) Mode of introduction

There are 2 modes: on-premises and cloud service. In the on-premises mode, the organization independently purchases and installs the server and other equipment and introduces LMS software on the server, while in the cloud mode, the LMS functions are provided as a service. In the cloud mode, there is no need for the organization to own the server equipment and software. A cloud service is more suitable for a LMS intended for third country training such as here.

(2) Type

There are 2 main types of LMS: the school type used in universities and other higher education institutions, and the human resources development type targeting employees of corporations and government agencies. If the organization implementing the training is of a certain size and requires layered management and long-term operation, a human resources development-type LMS is effective. If the targets of training are not dependent on any organizational structure and there is a straightforward relationship between teacher and trainees, a school-type LMS is more effective. Since the third country training targeted in this Study is utilized by multiple organizations and it is predicted that system authority will need to be managed, a resources development-type LMS is more suitable.

(3) Types of teaching materials

The teaching materials used in training may comprise PDF and PPT digital documents and audio and video materials. It is necessary to confirm whether the teaching materials to be used in the training are supported by the LMS products. If the training implementation agency has experience and know-how of producing teaching materials and has production tools that it is accustomed to using, an important factor concerns whether or not those tools are supported.

Table-2 Selection of LMS Products

Major item	Minor item	Conditions (Rough guide)	Description
Organization of the training receiving side	Organizational hierarchy	Yes (complicated)	If layered management is required in the organization of the training receiving side, LMS is suited because it is effective for developing corporate human resources. If unlayered, simple management is sufficient, Moodle-based LMS such as that used in schools is suited.
		No (singular)	
Organization on the management side	IT department	Yes	If the organization on the management side has an IT department, it is possible to select from an on-premise service in which the LMS is owned inside the organization, or a cloud service that is received. If there is no IT department, a cloud service is selected.
		No	
	Track record of LMS use	Yes	If there is a track record of LMS use, it is advantageous to select the LMS that was used until now. There is no need to study about the mechanisms and how to use a new LMS.
		No	
	Record of teaching materials creation	Yes	If there is a track record of creating LMS teaching materials, it is better to select a LMS that supports teaching materials creation tools that are known. There is no need to study how to use new tools.
		No	
Training plan	LMS introduction period	Long (6 months or longer)	In the case where the LMS introduction period is planned over the long term, it is possible to build on-premises, however, if the introduction period is short, a cloud service should be selected.
		Short (3 months or less)	
Features of training	Types of teaching materials		If the training features teaching materials such as VR videos, Web videos and digital documents, etc., it is better to select a LMS that supports each type of the teaching materials.
IT environment	Limitation on cloud use		Since there are some organizations that adopt security policy in which cloud use is limited, it is recommended to confirm the conditions of use in advance.

1.3 Selection of LMS Options

Almost all LMS products provide unique features and additional features as options. Depending on the product, the features that are used as basic features and the features that are used as options will differ. After narrowing down the LMS products in the selection process, it is necessary to investigate the contents of each system's respective options and consider their necessity.

(1) Teaching materials production feature options

LMS features include an option for providing a teaching materials production tool (authoring tool). If the LMS products is not equipped with a teaching materials production feature, there are also cases where Scorm features for incorporating produced materials and features for linking with external services are provided. It is necessary to conduct examination in view of the anticipated specifications and production methods of the teaching materials.

(2) Online (synchronous) meeting options

These are options for online meeting service and webinar service and are effective in cases where management of synchronous training is needed. In cases where the LMS has a feature for linking to Zoom or Teams and so on, it is necessary to manage the online meeting service contract and account. There are also cases where synchronous features are provided as LMS features, and the operating workload is mitigated in such cases because there is no need to think about signing and managing multiple service contracts.

(3) Video distribution options

Since video data is far heavier than other teaching materials data, video distribution options for spreading the distribution load and optimizing the size of video data are effective for utilizing video contents. Many LMS vendors provide video distribution features and options, however, sometimes these features are insufficient. It is especially important to have a low bitrate distribution feature for distributing to areas that have unstable internet lines. If the video distribution features provided by LMS vendors are inadequate, one approach is to not use such an option but rather utilize a video distribution server such as AWS or Vimeo or use a free service such as YouTube, etc.

(4) Proxy operation options

Following introduction of the LMS, these options are for a proxy service to conduct the user management, teaching materials management, training operation and so on that become necessary when conducting the training. Especially at the beginning of LMS introduction, since the structure and operating know-how may be limited, availability of a proxy operation service is an important viewpoint in selecting the LMS vendor.

Table-3 Selection of LMS Options

Major item	Minor item	Conditions (Rough guide)	Option/Description
Organization on the management side	Track record of teaching materials creation	Yes	Teaching materials production feature options: Select a teaching materials production option that enables the organization to leverage its know-how, for examples, tools that it is accustomed to using.
		No	
Features of training	Real-time	Yes	Online meeting option: Select an option such as Zoom, etc. If it is a large seminar that has more than 200 participants, also consider using webinar options.
		No	
	Video distribution	Yes	Video distribution option: Select if the teaching materials include videos. Since prices vary according to the size of video files and communication capacity during distribution, select an appropriate option.
		No	
Operating structure	Establishment status	Sufficient	Proxy operation service: Augment any roles that are deficient in one's own organization's LMS operating structure with a proxy service. Mitigate the load on staff by outsourcing regular tasks such as registering users and teaching materials and sending periodic communications to trainees. At the start of introduction, it is also possible to outsource the overall operation if it hasn't yet been established.
		Insufficient	
		None	

2. Contents Production

After the LMS has been decided, the component that entails the heaviest load in preparing for remote training is the production of contents. Especially when there is a lot of asynchronous training effective for LMS utilization, almost all the preparation is devoted to contents production. Accordingly, viewpoints have been sorted for examining the methods of contents production, which is the most important element in LMS utilization.

2.1 Judgment of necessity to produce contents

Online training may either be synchronous (remote training conducted in real-time) or asynchronous (use of on-demand teaching materials, submission of reports, etc.). It is necessary to examine which method is more effective in terms of enhancing the training effect.

In the synchronous type, aiming for similar positioning to conventional group training, the lecturer can revise the composition of instructions according to the reactions of the trainees on the spot, as opposed to composing and designing the teaching materials in detail. Since the teaching materials are mostly auxiliary materials, there is often little difference between the contents that are required in online training and the contents that are required in face-to-face training.

Meanwhile, in the asynchronous type, since it is difficult for the lecturer to observe the reactions of the trainees in real-time, it is necessary to design the course and teaching materials in detail. Accordingly, greater costs, time and effort are required in the early stages of development. However, the asynchronous type is effective for training that is implemented repeatedly; it offers better cost effectiveness in the medium-to-long term, and it allows the contents to be improved and developed based on the results of monitoring.

Another characteristic of the asynchronous type is that no restrictions are placed on the learning place and time. To leverage this characteristic, it is preferable for teaching materials to be capable of being completed in 5-10 minutes, etc.

This style of learning is referred to as microlearning, where contents of teaching materials are finely divided into small pieces for efficient and effective learning as short topics without interrupting the overall context. By repeating the process from acquisition of knowledge to trial implementation in short cycles, it is intended to enable the efficient learning of skills and enhancement of work performance as the outcome of training. Microlearning, which allows employees to learn things with the same attitude as researching facts in work and leverage the contents in their duties, can be expected to promote the establishment of learned contents and skills and lead to changes in behavior.

2.2 Contents Production Method

There are various types and methods of contents production for remote training, however, in all cases, it is necessary to determine whether to internally produce contents or outsource production. The following sections indicate the necessary viewpoints for examination, while Figure-2 shows the flowchart for producing contents.

- Necessary viewpoints if producing inside the organization:
  - From the objectives of the training, the Instructional Design (ID) including course design, setting of learning milestones, setting of effective activities and outputs, etc. can be implemented internally.
  - Based on the ID, the optimum types of teaching materials for the course contents can be selected.
  - Regarding the selected types of teaching materials, skilled production staff can be assigned.
  - The schedule can be compiled up to the start of training, and staff able to conduct progress management can be assigned.

- Necessary viewpoints if outsourcing to an external operator
  - The outsourced contents can be specified.
  - The scope of outsourcing broadly covers from planning to LMS registration and configuration, however, contractors that are capable of designing and planning specialized contents in the education field are limited.
  - The cost of outsourcing can be borne.
  - The schedule of the outsourced work can be managed.

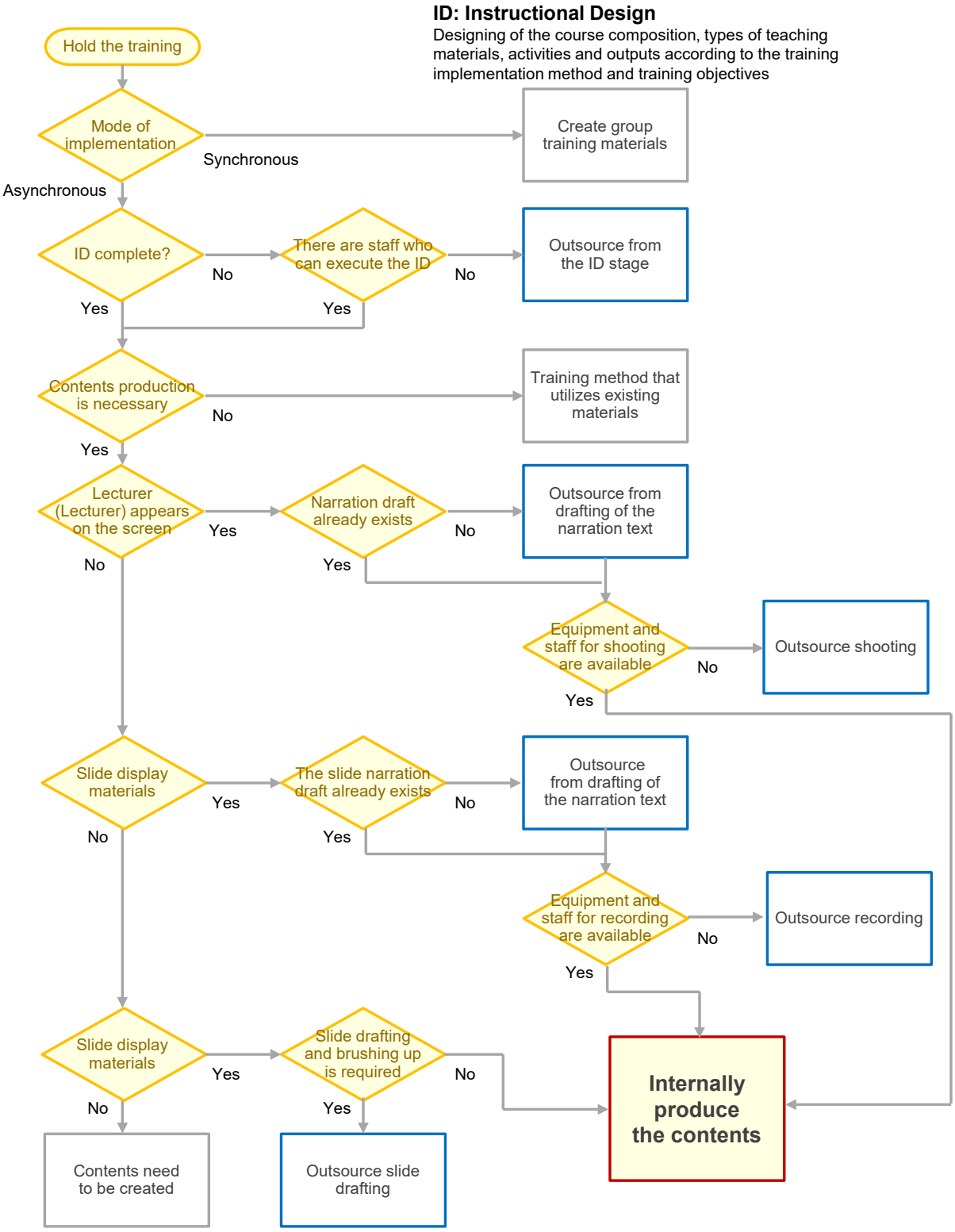


Figure-2 Chart for Examining Contents Production Methods

2.3 Selection of the Contractor, etc.

After the policy of contents production has been decided, it is necessary to select the contractor and examine and determine the scope and specifications of outsourcing. The following sections indicate the necessary viewpoints for doing this.

(1) Outsourced contents and viewpoints of contractor selection

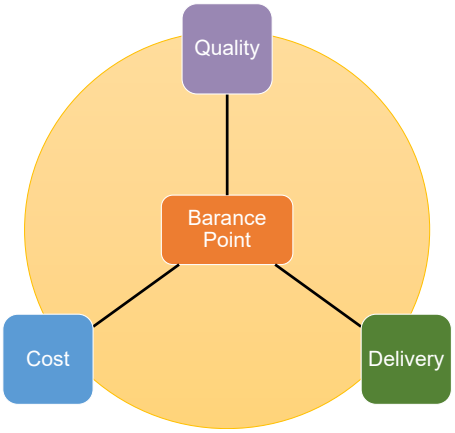
As is shown in Table 4 below, the viewpoints that should be examined differs according to the scope of contents production being outsourced. It is necessary to advance the examination while determining the contractor and also considering conditions in the training organization consigning the work.

Table-4 Work Outsourcing Scope Examination Chart

Outsourced contents	Contractor's skills	Information provided by the outsourcer
ID stage	The contractor should understand the characteristics of each method in online learning and be able to build an effective curriculum.	Objective and goals of the training, the contents that want to be imparted, and resources for teaching materials
Narration drafting	The contractor should have broadcasting staff whose native language is the training implementation language and who have experience of working on documentaries and news programs, etc.	A document summarizing the main contents of the training, and a course structure design document
Shooting	The contractor should be able to arrange for studio, shooting equipment and technicians and conduct direction of shooting scenes.	Shooting manuscript, storyboard, supervision of contents on the shooting sight
Recording	The contractor should be able to arrange for studio, shooting equipment and technicians and conduct direction of shooting scenes.	Shooting manuscript, storyboard, supervision of contents on the shooting sight
Slide drafting	The contractor should have document composition ability and have a graphic designer on its staff.	A document summarizing the main contents of the training, a course structure design document, charts and other materials

(2) Decision of contents specifications

When implementing remote training, maximizing the training effect is naturally a goal, however, in the case of producing contents for asynchronous remote education, the most important thing is examination of cost effectiveness. It is easy to improve the quality of asynchronous contents, however, doing so entails higher cost and longer production period.



Accordingly, it is important to consider the balance between the scale of training targets, length of the training implementation period, and outputs obtained from the training.

It is necessary to decide on contents specifications and production methods that achieve a balance between Quality, Cost and Delivery and satisfy the required standards.

Since QCD entails tradeoffs, there are priority items in each case. For example, if the delivery deadline is tight, it is necessary to decide between increasing costs or reducing quality and so on.

3. Utilization of JICA-VAN

JICA-VAN, which utilizes the LMS introduced by Cornerstone Co. in 2021, is clearly effective as a LMS developed for medium-to-long-term operation. Moreover, workload can be reduced by following the JICA-VAN-designated workflow for conducting the LMS selection and contents production indicated in Chapter 1 and Chapter 2. However, JICA-VAN has only just gone into operation, and this Study revealed that the following points require consideration.

3.1 Judgment of whether to Utilize JICA-VAN

In cases where the training characteristics are suited to remote implementation, LMS utilization is deemed to be effective, and there is no local LMS as in the case of third country training, JICA-VAN can also be utilized in Latin America and the Caribbean. However, since it is necessary for staff to understand the system and it is inevitable that workload is created in configuring and operating the system, it is necessary to examine whether to utilize it while considering the following points.

- The LMS needs to be configured by staff members who have experience of operating IT systems.
- In using the system, it is possible to spend ample time on trials, etc.to understand the unique concepts of the Cornerstone OnDemand system.
- It is important to utilize the system upon understanding the restrictions on functions and authority that are imposed under JICA's overall security policy.

- If JICA-VAN is being used for the first time, ample preparation time is needed between formulating the training program and utilizing JICA-VAN.
- When utilizing asynchronous contents on JICA-VAN, various constraints exist. Therefore, if implementing training that comprises mainly asynchronous contents, it is necessary for the staff in charge to understand the JICA-VAN system and have knowledge of digital contents.

These are the current viewpoints, however, once the operating structure for JICA-VAN becomes established with manuals and a support setup, it is anticipated that the scope of activity will be further expanded.

Moreover, information stated in these guidelines (1.1 Judgment of necessity to use LMS) can be utilized as a common viewpoint in JICA-VAN too.

3.2 Selection of the JICA-VAN Scope of Utilization

After it has been decided that JICA-VAN can be utilized in remote training, it is necessary to consider how to utilize the various system features of JICA-VAN in the training concerned.

Whether the training be conducted face-to-face or remotely, the conditions of the training program vary diversely according to the training contents, and there are numerous methods for aligning such conditions with the features of JICA-VAN. Accordingly, in examining methods for utilizing such features, it is necessary to first sort the training program conditions and then decide while considering the balance between “operation (configuration) load” and “training work efficiency”. Especially at the beginning, since there is a risk of the operation load being greater than the training work efficiency, it is recommended that work be started from the minimum features and that the scope of utilization be gradually expanded in line with the degree of learning of staff in charge. Viewpoints for examining the scope of utilizing functions are sorted below.

- Synchronous/Asynchronous
  - Case of synchronous training: availability of two-way communication, need for attendance management, need for social learning between trainees, need for task submission management, etc.
- Need for management of trainee outputs
  - Need for automatic correct answer/incorrect answer adjudication, need for feedback on tasks, need for social learning between trainees, use of questionnaires, need for pre-training and post-training tasks, etc.
- Contents security
  - Existence of data download control from the viewpoint of copyright protection

- Asynchronous contents specifications
  - If asynchronous contents comprise videos, it is necessary to consider the length and volume of videos and distribution quality such as bitrate, etc.
- Manager authority
  - Since functional restrictions arise corresponding to the operating structure, it is necessary to consider the composition of managers and composition of trainee groups.

Moreover, since it is possible that the above-mentioned features and functions will be revised in line with future updates to the overall JICA-VAN system, it will be necessary to wait for future information and manual preparation and confirm the latest information when using.

Appendix 3: Details of data analysis results of the demonstration survey 4 (Data analysis related to contents and JICA-VAN)

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1. Demonstration Survey (PoC) 4: Improvement of IT Literacy of Staff in JICA Overseas Office

1-1. The data analysis results (data analysis concerning contents and JICA-VAN)

In this Demonstration Survey (PoC), data analysis was implemented based on the access histories of staff in JICA Overseas Offices and 48 users registered with JICA-VAN and results of questionnaire. The Demonstration Survey (PoC) was implemented upon preparing 2 methods for accessing the contents: posting SCORM-format contents on JICA-VAN, and releasing contents as YouTube videos for limited access. The following figure shows the post-training questionnaire results concerning which method the trainees used.

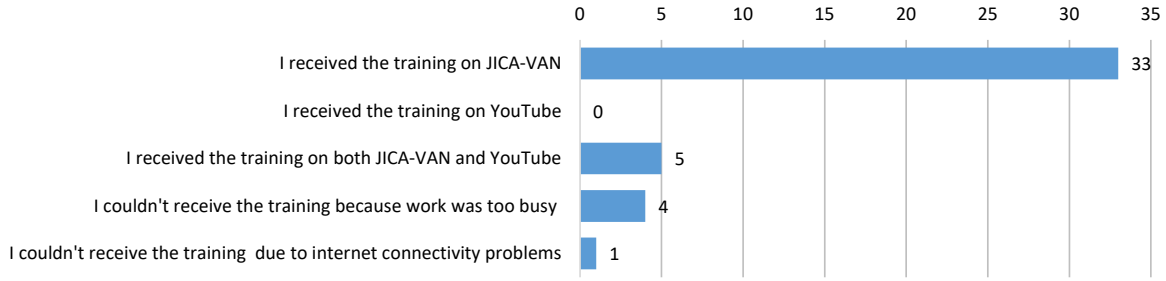

Figure-1 Method Used to Access Demonstration Contents

Analysis

- Most of the participants took the course on JICA-VAN. Some of the participants took the lessons on JICA-VAN and then followed them up by taking them on YouTube too. The reasons they gave were that they wanted to reconfirm the contents on YouTube, and they wanted to fast forward the videos on YouTube because it was not possible to change the play speed of videos on SCORM.
- Concerning reasons for not taking (being unable to take) the lessons, 4 participants said they were too busy with work, while 1 participant said that he couldn't do it due to technical difficulties connecting to the internet, etc. (Staying connected to the internet for an extended period was a problem and prevented participation).

The following figure shows the totaled results from post-training questionnaire of responses to questions about the places where lessons were taken, the types of PC used, and the training times of each trainee in JICA-VAN reporting 2.0.

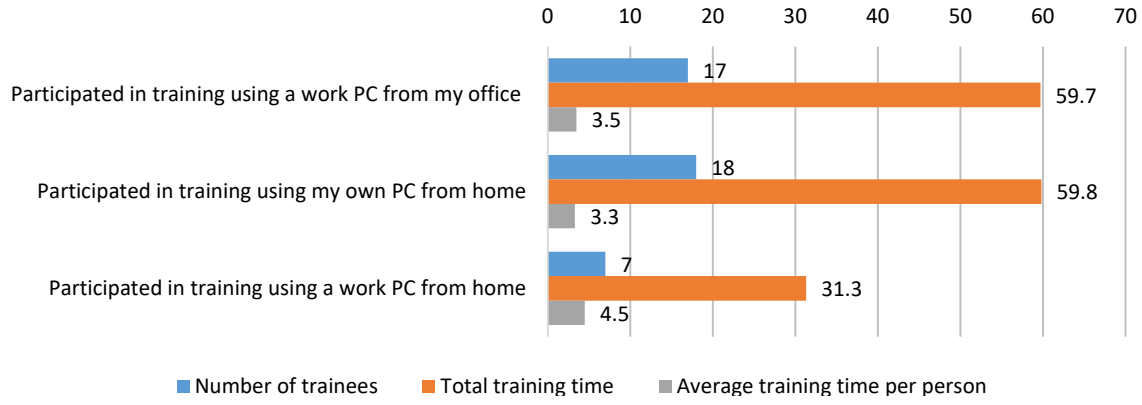

Figure-2 Number of Trainees and Lesson Time (Total Training Time) according to Each Training Location and Type of PC

Analysis

- The training time of participants who took lessons from home was approximately 6 hours longer than those who took them from the workplace, and it is surmised that this reflects the universal access characteristic of e-learning, albeit with some influence from the COVID-19 pandemic.
- The average training time per participant exceeded the estimated contents learning time of approximately 3 hours; hence, it is surmised that many of the participants went through the contents at least once.
- Concerning why the training time on work PCs was longer than that on private PCs, it is thought that the former type was more suited to learning (easier to learn).

The following figure shows the totaled results concerning the access environment (internet speed, stability, etc.) for each module.

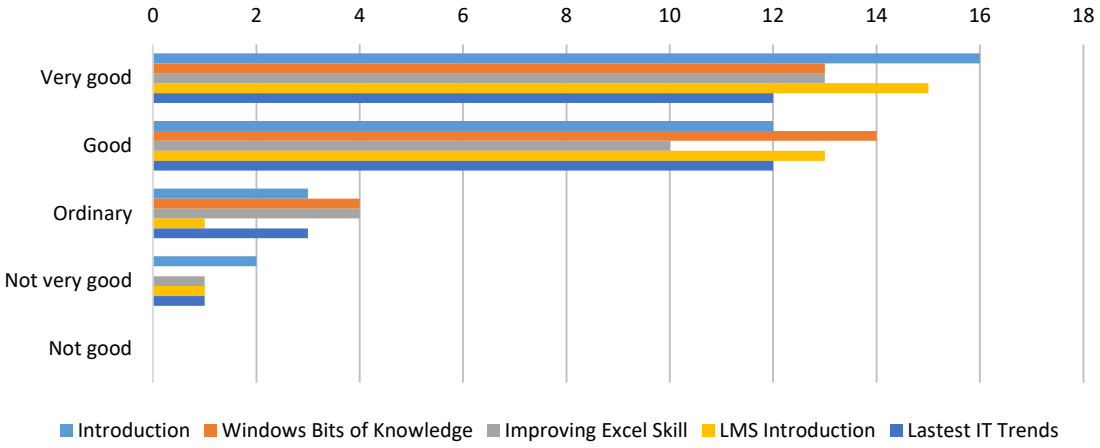

Figure-3 Concerning the Access Environment (Internet Speed, Stability, etc.) for Contents

Analysis

- Since most participants answered that the access environment was very good, good or normal, it is surmised that there were no particular problems.
- The size of SCORM contents ranged from approximately 18MB (Introductory module) to 52MB (Excel skill improvement module), however, no differences were observed according to the size of contents. Accordingly, assuming capacity of contents on this level, it is surmised that no problems will arise in terms of pressure on the internet line bandwidth, etc.

The following figure shows the results obtained by totaling the access histories to each module (number of trainees and training time).

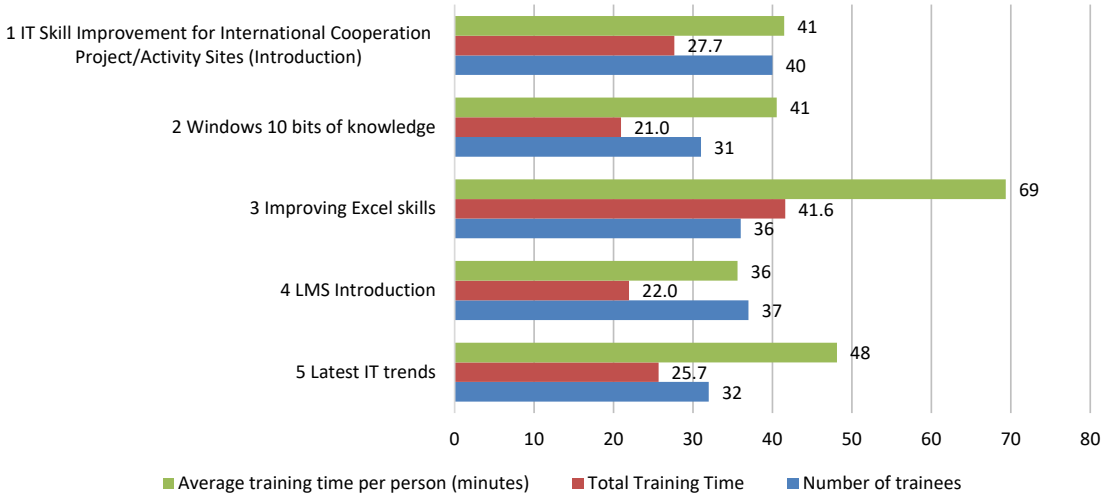

Figure-4 JICA-VAN Reporting 2.0 (Total Training Time)

Analysis

- In the Introductory module, the average training time per person in respect to a 20-minute video is 41 minutes; hence it is surmised that many of the trainees took almost all of the contents including the quiz and questionnaire.
- The training time for Excel is longer than for the other modules. This is due to the fact that the Excel contents were the longest of the 5 modules; moreover, it is surmised that the inclusion of drill files (in reference to the table showing past acceptance of trainees from Latin America and the Caribbean) led to the participants taking the module while actually testing the contents.
- Because the training time for Excel is longer than for the other modules, it is surmised that the participants are highly interested in improving their Office app skills.

According to the results of the above figure, because the training time for improving Excel skills was longer than for other contents, analysis was implemented on related questions. The following figure shows the results obtained in response to the question about times of Windows and Excel use (number of hours) out of the weekly work time (assuming 40 hours a week).

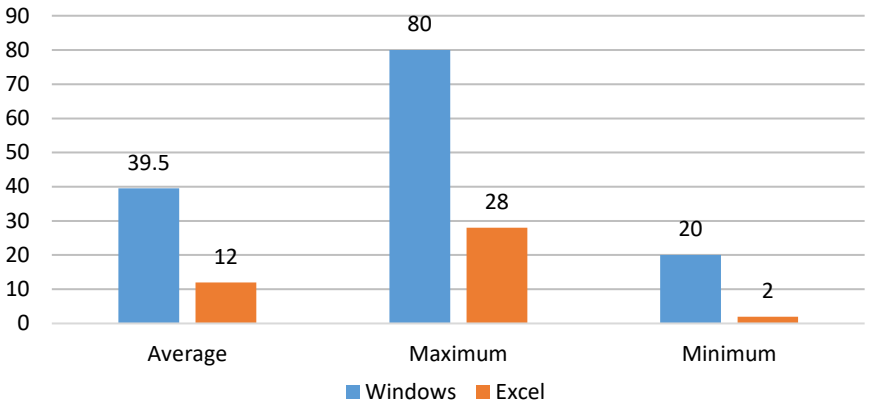

Figure-5 Windows and Excel Weekly Use Times (assuming work of 40 hours a week)

Analysis

- According to the average figures, the participants devote approximately 30% of their time on Windows to using Excel, indicating that they spend a lot of their time at PCs working on Excel spreadsheets, etc.
- Looking at maximum values, Excel use time climbs to 35%, indicating that the longer that participants spend using PCs in their work the longer they spend on Excel.

Next, concerning the types of Excel features that are especially used and the extent of their use, the following two figures show the results of questions concerning level of use of the basic shortcut keys of Windows and Excel.

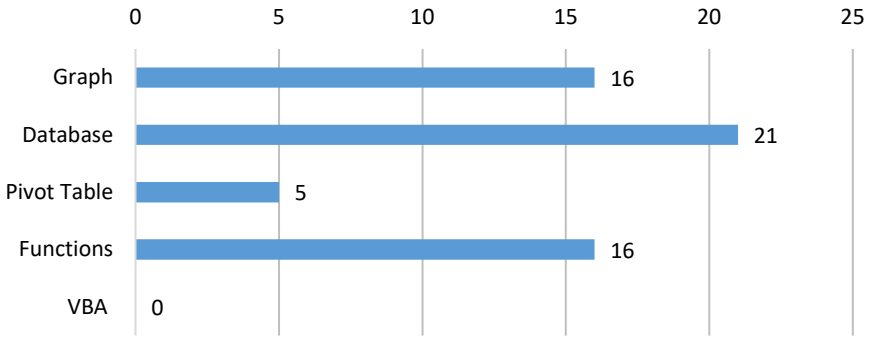

Figure-6 Excel Features Regularly Used in Work

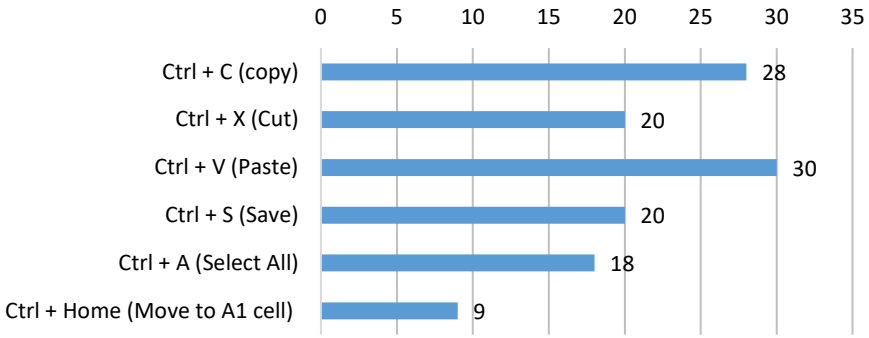

Figure-7 Windows and Excel Shortcut Keys Regularly Used in Work

Analysis

- Many participants are using the basic shortcut keys that are common to Windows, however, it seems that few are using the shortcut keys specific to Excel.
- Many participants are using the graph, database (spreadsheet), etc.) and function keys in Excel.
- It seems that high-level analysis features such as cross tabulation based on pivot tables, etc. are not used very much.
- It seems that many of the participants are not yet fully utilizing the features for automating and improving the efficiency of work such as VBA and macro.

The following figure shows the results, compared between before and after the PoC (before and after the participants underwent training in the contents), in response to the question about what kind of contents would be required in the case of future full-scale creation of contents including Excel.

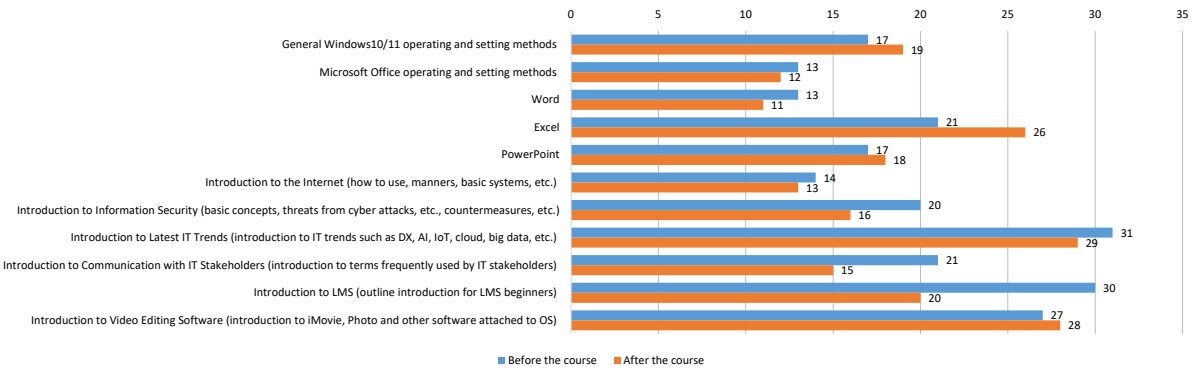

Figure-8 Contents the Participants Want to Learn in Future
(Comparison between Before and After the Training)

Analysis

- The number of participants who want to learn Excel increased compared to before the training (from 21 to 26 responses).
- The number of participants who stated a preference for the latest IT trends was highest both before and after the training.
- The number of participants who stated a preference for LMS decreased (from 30 to 20 responses), however, since a lot of the participants indicated a desire to learn video editing tools, it is surmised that many staff members want to learn about how to create video contents.
- Concerning comments about Excel, many participants indicated a desire to improve skills regarding full-scale utilization of data analysis tools such as functions, macro, VBA, pivot tables, Power BI, etc.

Next, the following table shows responses to the question about what is required for further improvement of IT literacy in future, and results concerning the total number of hours spent by the participants receiving training on JICA-VAN in respect to each answer.

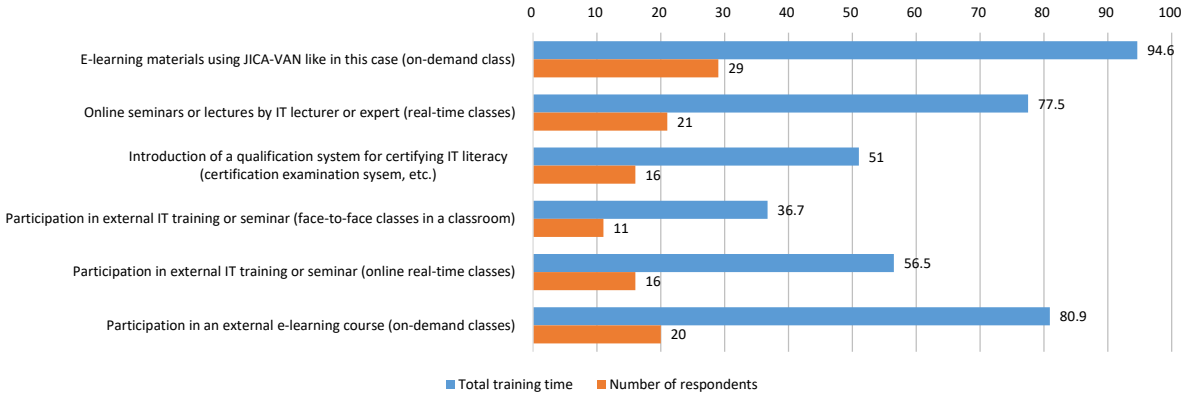

Figure-9 Things Deemed Necessary for Future Improvement of IT Literacy,
and Total Training Time on JICA-VAN of Respondents

Analysis

- In terms of the number of respondents, many of the participants answered that e-learning on JICA-VAN is necessary (29 persons).
- In terms of the total training time too, the participants who answered that e-learning on JICA-VAN is necessary spent a long time on training (94.6 hours)
- It is surmised that there is a trend where participants who used JICA-VAN for a long time also wish to conduct e-learning on JICA-VAN in future.

Next, the following figure shows responses to the question about the operability of JICA-VAN features, and results concerning the total number of hours spent by the participants receiving training on JICA-VAN in respect to each answer.

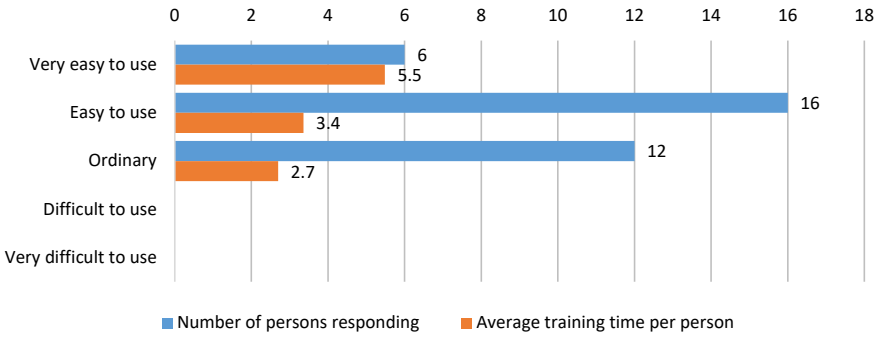

Figure-10 JICA-VAN Features and Operability, and Total Training Time of Respondents

The main comments concerning the features and operability of JICA-VAN were as follows.

- On the top page for trainees, the contents are displayed in the horizontal direction (continue learning) and vertical direction (already allocated/no date), however, the listing sequence differs.
- If it were possible to visualize how much progress trainees have made in the contents and the timing of when they will complete the contents, the motivation to receive training would be boosted.

Analysis

- Approximately 65% of the participants overall responded that the features are extremely easy to use or easy to use.
- Since the participants who responded that the features are extremely easy to use or easy to use tended to have longer training times, it is surmised that the ease of use of JICA-VAN enhances learning motivation.

Next, the following figure shows responses to the question about how much the JICA-VAN community feature was used, and results concerning the total number of hours spent by the participants receiving training on JICA-VAN in respect to each answer.

Figure-11 Frequency of Use of the JICA-VAN Community Feature, and Training Time of Respondents

The main comments concerning the community feature were as follows.

- I am too busy with work to use the community feature.
- After logging in, I cannot confirm whether there have been any new posts on the top page.
- I have nothing to discuss in the community (I don't feel any interest or need).

Analysis

- Approximately 57% of the participants overall responded that they didn't use the community feature.
- Since the participants who responded that they use the community feature every time or sometimes tended to have longer training times, it is surmised that trainees utilize the community feature after they become accustomed to using JICA-VAN.

The following figure shows results in response to the question about the sound quality of the Amazon Polly service for converting sentences into audio by means of AI. This service was used for making audio recordings of the contents in this Demonstration Survey (PoC).

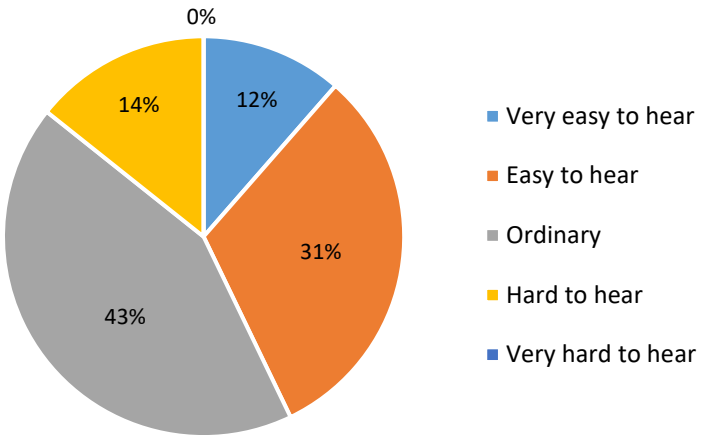

Figure-12 Sound Quality of Contents (Ease of Listening)

The main comments concerning the audio created using Amazon Polly are as follows.

- The audio speed is too fast (too slow).
- The pronunciation of certain words is not good.
- There is no consideration for the timing of spaces and punctuation marks.
- Even using the same Spanish language, some words are not used in certain areas.

Analysis

- Since the total number of persons saying the audio was “extremely easy to hear” or was “easy to hear” was less than half of the total of participants, it is necessary to improve the sound quality.
- Here, checking of the audio by a native speaker was limited to checking whether there were any major problems in hearing the overall audio, but it was not possible to check down to individual words.
- Here, audio was recorded with Amazon Polly configured to its default setting.
- To introduce in earnest, it will be necessary to conduct a detailed check by native speaker and make high-level pronunciation adjustments based on speech synthesis markup language (SSML[1]), etc. with a view to improving the audio quality further.

Finally, the following two figures show results in response to questions about the overall content and level (difficulty) of the contents.

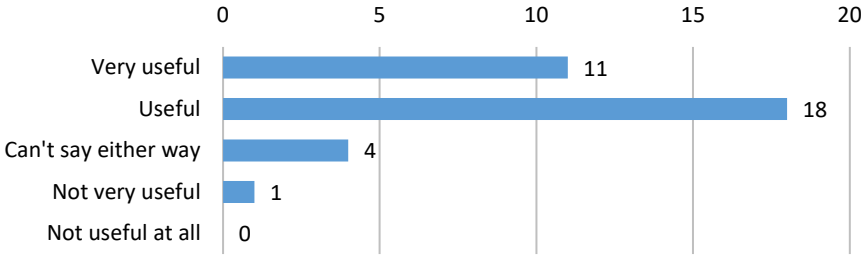

Figure-13 Concerning Content of the Contents

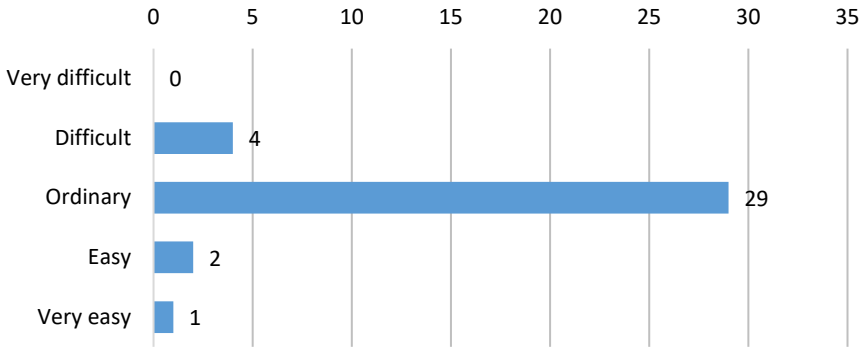

Figure-14 Concerning Level (Difficulty) of the Contents

Analysis

- It is surmised that the overall contents proved useful (could be understood) to an extent.
- It is surmised that the overall contents were not very difficult (could be understood).

[1] SSML (Speech Synthesis Markup Language): Markup language in which the pronunciation and accentuation can be finely controlled.

Appendix 4: Format of Questionnaire

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1. Questionnaire on remote implementation of the JICA projects/activities, for JICA Overseas Offices (Spanish)

Encuesta a las oficinas de JICA
Estudio de Recopilación de Datos para introducir un nuevo modelo eficiente de Trabajo Remoto para la implementación de los Proyectos/Actividades de JICA en las áreas de América Latina y el Caribe

El presente estudio tiene como objetivo principal proponer métodos de mejorar el entorno del TIC, crear un mecanismo de ejecución a distancia de proyectos utilizando la tecnología de DX y arraigarlo mediante la confirmación y análisis de la forma de ejecutar los proyectos/actividades de la JICA (incluyendo programas de capacitación, cooperaciones técnicas y cooperaciones financieras) y el sistema de ejecución de contrapartes y la JICA en América Latina y el Caribe y la ejecución de estudios demostrativos. Esperamos contar con su colaboración.

Como podrán ver, hay 2 cuestionarios (en japonés y en español) del mismo contenido. No es necesario contestar en los 2 idiomas sino en un solo idioma. Esperamos que cada sitio u oficina de la JICA conteste un cuestionario.

Yukiyo Yamada
Líder del equipo de consultores
Senior Consultant, Japan Development Service Co., Ltd.

Enviar de vuelta del cuestionario a: latin_ict@jds21.com
Fecha límite del envío de la respuesta: miércoles 24 de febrero, hora japonesa

I. Sobre la persona que conteste

Nombre de la oficina de la JICA (nombre del país): Haga clic o pulse aquí para escribir texto.
Nombre de la persona que conteste: Haga clic o pulse aquí para escribir texto.
Cargo de la persona que conteste: Haga clic o pulse aquí para escribir texto.
Correo electrónico de la persona que conteste: Haga clic o pulse aquí para escribir texto.

II. Sobre la ejecución de los Cursos de Capacitación a Distancia

Aquí preguntaremos sobre cursos en cuya ejecución participó su oficina de JICA (por ejemplo, hizo llamamientos para la participación) en 2020.

1. Cursos cuya ejecución a distancia parece haber tenido éxito

(1) ¿Entre los cursos ejecutados en 2020, hay cursos cuya ejecución a distancia parece haber tenido éxito con buena reputación? Si hay, anote su nombre a continuación (máximo 3 cursos).

No.	Nombre del curso
1	Haga clic o pulse aquí para escribir texto.
2	Haga clic o pulse aquí para escribir texto.
3	Haga clic o pulse aquí para escribir texto.

(2) ¿Por qué cree usted que dicho (s) curso (s) tuvo (tuvieron) éxito? Escoja posibles razones (puede escoger varias respuestas).

☐ Porque el contenido del curso era adecuado para la ejecución a distancia
(porque el contenido podía esperar suficiente éxito aún con la ejecución a distancia)
☐ Porque se utilizó una herramienta adecuada para la ejecución.
(Herramienta utilizada (si usted la sabe): Haga clic o pulse aquí para escribir texto.)
☐ La propia ejecución a distancia tuvo buena aceptación (al contrario la ejecución no presente resultó favorable)
(Aspectos favorables de la ejecución a distancia: Haga clic o pulse aquí para escribir texto.)
☐ Otras (Haga clic o pulse aquí para escribir texto.)

(3) ¿A pesar del éxito, se presentó algún problema que resolver, incluyendo en los preparativos del curso? Si hay, anótelo a continuación.

Haga clic o pulse aquí para escribir texto.

2. Cursos que no se pudieron ejecutar a distancia, o cursos ejecutados a distancia que resultaron fracasos

(1) ¿Entre los cursos de 2020, hay cursos cuya ejecución a distancia se tuvo que renunciar o cursos cuya ejecución a distancia pareció ser un fracaso con mala reputación? Si hay, anote su nombre a continuación (máximo 3 cursos).

No.	Nombre del curso
1	Haga clic o pulse aquí para escribir texto.
2	Haga clic o pulse aquí para escribir texto.
3	Haga clic o pulse aquí para escribir texto.

(2) ¿Por qué cree usted que no se pudo (o fracasó) ejecutarlo (s) a distancia? Escoja posibles causas (puede escoger varias respuestas).

☐ Porque el contenido del curso no era adecuado para la ejecución a distancia (porque no era posible ejecutar el contenido a distancia).
☐ Porque era indispensable hacer prácticas en sitio en el curso.
☐ Porque eran las horas difíciles de participar para los participantes debido a la diferencia horaria con Japón.
☐ Porque no se llenaron las plazas fijas de participación (porque muchas personas declinaron la participación una tras otra).
☐ Otras (Haga clic o pulse aquí para escribir texto.)

III. Sobre la ejecución de las cooperaciones técnicas y financieras

1. ¿Entre las cooperaciones técnicas y financieras (excepto programas de capacitación) que están en ejecución en su país, hay casos favorables de ejecución a distancia utilizando herramientas de TI, etc.? Si hay, háganos saberlos.

No	Nombre del Proyecto	Información general de la ejecución a distancia (por ejemplo, se dan instrucciones a distancia desde Japón, etc.)
1	Haga clic o pulse aquí para escribir texto.	Haga clic o pulse aquí para escribir texto.
2	Haga clic o pulse aquí para escribir texto.	Haga clic o pulse aquí para escribir texto.
3	Haga clic o pulse aquí para escribir texto.	Haga clic o pulse aquí para escribir texto.

IV. Sobre la ejecución a distancia de los trabajos de la oficina de la JICA

1. Preguntaremos sobre todos los trabajos (incluyendo trabajos de administración general como la logística) hechos en la oficina de la JICA en su país.

(1) ¿En la oficina de la JICA de su país hay empleados que hagan trabajos de oficina en casa?

☐ Sí ☐ No

(2) ¿Hay trabajos que se han vuelto complicados debido al trabajo en casa/a distancia de las operaciones de oficina? Si hay, díganos cómo se han vuelto complicados (puede escoger varias respuestas).

☐ Trabajos relacionados con programas de capacitación (Haga clic o pulse aquí para escribir texto.)
☐ Trabajos relacionados con la cooperación técnica o financiera (Haga clic o pulse aquí para escribir texto.)
☐ Trabajos relacionados con la logística (Haga clic o pulse aquí para escribir texto.)
☐ Otros (Haga clic o pulse aquí para escribir texto.)

(3) ¿Tendría usted alguna idea o sugerencia para que el trabajo en casa/a distancia de las operaciones de oficina sea más conveniente (eficiente)? Si hay, compártala con nosotros, por favor.

Haga clic o pulse aquí para escribir texto.

(4) Díganos cuáles herramientas se utilizan para la comunicación e intercambio de archivos con organizaciones de contraparte y participantes de capacitación, en caso del trabajo en casa de las operaciones de oficina.

☐ WhatsApp ☐ Microsoft Teams ☐ Zoom ☐ Gigapod ☐ Almacenamiento en nube como One Drive
☐ Otras (Haga clic o pulse aquí para escribir texto.)

Muchas gracias por su colaboración.

2. Questionnaire on ICT environment in countries with JICA Overseas Offices and Project/ Activity sites, for JICA Overseas Offices (Spanish)

Encuesta a las oficinas de JICA (Sobre el Entorno del TIC)
Estudio de Recopilación de Datos para introducir un nuevo modelo eficiente de Trabajo Remoto para la implementación de los Proyectos/Actividades de JICA en las áreas de América Latina y el Caribe

El presente estudio tiene como objetivo principal proponer métodos de mejorar el entorno del TIC, crear un mecanismo de ejecución a distancia de proyectos utilizando la tecnología de DX y arraigarlo mediante la confirmación y análisis de la forma de ejecutar los proyectos/actividades de la JICA (incluyendo programas de capacitación, cooperaciones técnicas y cooperaciones financieras) y el sistema de ejecución de contrapartes y la JICA en América Latina y el Caribe y la ejecución de estudios demostrativos.

Nuestra empresa (Japan Development Service Co., Ltd.), tras recibir el encargo del presente estudio, inició oficialmente el estudio el 8 de enero del presente año. Este cuestionario se utilizará para verificar la información básica del entorno del TIC en las oficinas de la JICA en América Latina y el Caribe. Esperamos contar con su colaboración.

Como podrán ver, hay 2 cuestionarios (en japonés y en español) del mismo contenido. No es necesario contestar en los 2 idiomas sino en un solo idioma. Esperamos que cada sitio u oficina de la JICA conteste un cuestionario.

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Enviar de vuelta del cuestionario a: latin_ict@jds21.com
Fecha límite del envío de la respuesta: miércoles 24 de febrero, hora japonesa

I. Sobre la persona que conteste

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Cargo de la persona que conteste:

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Correo electrónico de la persona que conteste:

Haga clic o pulse aquí para escribir texto.

II. Entorno básico del TIC de las oficinas de la JICA y los países en que están las oficinas

1. Entorno del TIC de las oficinas de la JICA

(1) ¿El entorno de TIC de la oficina funciona las 24 horas del día o se apaga la electricidad del entorno de TIC en las noches y los días de descanso?

☐ Funciona las 24 horas del día.
☐ Se apaga la electricidad en las noches y los días de descanso.

(2) En caso de que la respuesta a la pregunta anterior es que el entorno de TIC funciona las 24 horas del día, ¿cuáles aparatos funcionan permanentemente?

☐ Servidor (anote a continuación el tipo del servidor (puede escoger varias respuestas)
  ☐ Servidor de archivos
  ☐ Servidor de correo
  ☐ Otros (Haga clic o pulse aquí para escribir texto.)
☐ Punto de acceso de Wi-Fi (mencione a continuación el motivo de su funcionamiento permanente) (Haga clic o pulse aquí para escribir texto.)
☐ Otros (Haga clic o pulse aquí para escribir texto.)

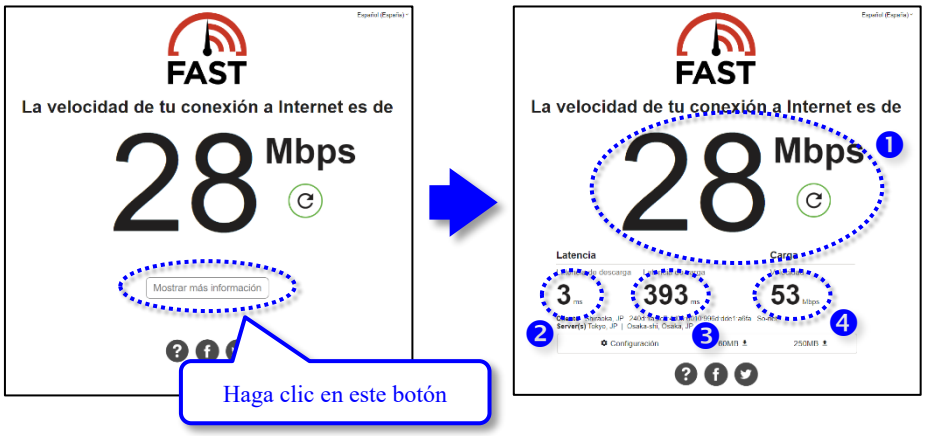
(3) ¿Hay persona encargada del TIC en la oficina (que sepa configurar una computadora o una red de internet o resolver problemas de la computadora)?

☐ Sí (Personal japonés o local)
☐ Sí (Empresa contratista exterior)
☐ No

(4) ¿La oficina dispone de otra línea de internet de uso común además de la propia de la JICA?

☐ Sí ☐ No

(5) En caso de que la respuesta de la pregunta anterior es “Sí”, haga el favor de acceder a “fast.com” desde su oficina por medio de la línea de internet (que no sea la propia de la JICA), y anote a continuación los números mostrados con su unidad (las letras que siguen a los números como “28Mbps “ o “393ms “) como se muestra abajo.



❶ Haga clic o pulse aquí para escribir texto.
❷ Haga clic o pulse aquí para escribir texto.
❸ Haga clic o pulse aquí para escribir texto.
❹ Haga clic o pulse aquí para escribir texto.

(6) Denos las siguientes informaciones en caso de que la oficina tiene computadoras portátiles para prestar.

- ¿Se prestan las computadoras solamente a los empleados de la oficina o pueden prestarse también a las personas relacionadas exteriores (como participantes de capacitación a distancia)?

  ☐ Se prestan solamente a los empleados de la oficina.
  ☐ Pueden prestarse también a las personas relacionadas exteriores.

- En caso de que se pueden prestar las computadoras a las personas relacionadas exteriores, ¿qué sistema de control de ellas tiene la oficina? (Por ejemplo, llevar un registro del nombre y contacto de la persona a quien se presta una computadora y la fecha prevista de devolución, y la fecha en que se devolvió realmente.)

  Haga clic o pulse aquí para escribir texto.

- ¿Las computadoras para prestar tienen instalado un software de seguridad? En caso de que tiene un programa de seguridad, díganos su nombre (si lo sabe usted).

  ☐ Sí
  (Nombre del software: Haga clic o pulse aquí para escribir texto.)
  ☐ No

(7) ¿Habrá la posibilidad de que la oficina acoja a personas para que ellas participen en un programa de capacitación a distancia desde la oficina?

☐ Sí ☐ No

(8) Díganos sobre apagones en la oficina.

- ¿Con qué frecuencia se corta la electricidad (en la oficina)?

  ☐ Varias veces al día
  ☐ Aproximadamente una vez por día
  ☐ Unas veces por semana
  ☐ Unas veces por mes
  ☐ Unas vedes por año
  ☐ Apenas hay

- ¿Cuánto tiempo dura un apagón como promedio?

  ☐ 1 minuto o menos
  ☐ Unos minutos
  ☐ Más de diez minutos y menos de una hora
  ☐ Unas horas

- ¿Las computadoras de la oficina tienen un UPS (Sistema de Alimentación Ininterrumpida-SAI)?

  ☐ No lo tienen (se utilizan computadoras portátiles).
  ☐ No lo tienen (se utilizan computadoras de escritorio).
  ☐ Sí, lo tienen.

2. Entorno del TIC fuera de las oficinas de la JICA

(1) ¿Entre los sitios principales de Web, hay algunos con limitación de acceso desde una línea de internet de uso común en su país? (Ejemplo: Google, Facebook, etc.)

Haga clic o pulse aquí para escribir texto.

(2) ¿Hay algunos sitios de actividades de capacitación, proyectos de cooperación técnica o financiera (incluyendo organizaciones de contraparte) con los que la oficina de la JICA tuvo dificultades de comunicarse debido especialmente a mal entorno de internet? Si hay, responda a siguientes preguntas (dentro de lo que usted sepa).

- ¿Con qué lugar la oficina tuvo dificultades de comunicación?
  (Puede escoger varias respuestas.)

  ☐ Área metropolitana
  ☐ Ciudades regionales

☐ Pequeñas municipalidades
☐ Lugares aislados

- ¿Cuánta dificultad tuvieron en la oficina para comunicarse?
  (Puede escoger varias respuestas)

  ☐ No se puede comunicar por teléfono celular ni por correo electrónico.
  ☐ Se puede comunicar por teléfono celular pero no sirve el correo electrónico ni WhatsApp.
  ☐ Sirven el correo electrónico y WhatsApp, pero apenas se puede ver sitios Web y no se puede descargar archivos.
  ☐ Hay veces que se puede comunicar y hay veces que no, según la hora.

- Entre todas las actividades de capacitación, los proyectos de las cooperaciones técnicas y las financieras de su país, ¿cuánta proporción ocupan los que tienen problemas del entorno de internet arriba mencionados, como un cálculo aproximado?

  ☐ Proporción muy pequeña (10% o menos)
  ☐ Mitad o menos
  ☐ Más de la mitad
  ☐ Proporción casi total (90% o más)

Muchas gracias por su colaboración.

3. Questionnaire on remote implementation of TCTP (Spanish)

Estudio de recopilación de datos para introducir un nuevo modelo eficiente de trabajo remoto para la implementación de los proyectos/actividades de JICA en las áreas de Latinoamérica y el Caribe

Encuesta sobre la implementación remota de la Capacitación para Terceros Países

Estimados Señores encargados de la Capacitación para Terceros Países de la Oficina JICA,

Señores encargados del organismo de implementación de la Capacitación para Terceros Piases (organismo C/P), y Todos los interesados

Queremos realizar una encuesta sobre la situación actual y el plan de la implementación remota de la Capacitación para Terceros Países en las regiones de Latinoamérica y el Caribe. Sabemos bien que están muy ocupados en sus trabajos, pero agradeceríamos mucho su amable colaboración para contestarla. (Favor de enviar la respuesta al correo electrónico: latin_ict@jds21.com)

Nombre completo de la persona que contesta esta encuesta:

Haga clic o pulse aquí para escribir texto.

Organismo y el departamento al que pertenece la persona que contesta:

Haga clic o pulse aquí para escribir texto.

Correo electrónico de la persona que contesta:

Haga clic o pulse aquí para escribir texto.

1. **Coméntennos del curso (s) de la Capacitación para Terceros Países en las regiones de Latinoamérica y el Caribe que se tiene planeado su implementación en línea para este año fiscal 2021. (Se pueden contestar múltiples respuestas.)**

Nombre del curso de la capacitación	Fecha de implementación	País anfitrión	Países participantes
Nombre del curso	Fecha	País anfitrión	Países participantes

Para agregar un renglón, favor de hacer click aquí

- Cuando se realiza la capacitación remota, ¿desearían utilizar las siguientes herramientas de tecnología informática (IT)?
  - Aprendizaje en línea mediante el LMS (e-learning): Seleccione la respuesta.
  - Plataforma de video-conferencia en línea (como Zoom, Teams, etc.): Seleccione la respuesta.
  - Webinar (Conferencia en línea que separa al instructor de los participantes): Seleccione la respuesta.
  - Herramienta de Chateo (como WhatsApp, LINE, etc.): Seleccione la respuesta.

- Herramienta de trabajo conjunto en grupos (como Slack, etc.): Seleccione la respuesta.
- Monitoreo de la capacitación y/o trabajos en sitio en línea vía video : Seleccione la respuesta.
- Experiencia simulada mediante la realidad virtual (Virtual Reality: VR): Seleccione la respuesta.
- Herramienta para compartir archivos (OneDrive, Google Drive, etc.): Seleccione la respuesta.
- Otros (favor de escribir concretamente.): Haga clic o pulse aquí para escribir texto.

2. De la Capacitación para Terceros Países que se tiene planeada para 2021 en las regiones de Latinoamérica y el Caribe, ¿cuál curso piensan que <u>es difícil realizarlo en línea</u>? Coméntennos su razón también. (Se pueden contestar múltiples respuestas.)

Nombre del curso de la capacitación	País anfitrión	Países participantes
Nombre del curso	País anfitrión	Países participantes

- Razones por las que se hace difícil realizar el curso en línea
  (Se pueden contestar múltiples respuestas.):

  ☐ Deseamos realizarlo de manera presencial en lugar de en línea. (Favor de describir su razón en el espacio abajo de "Otras razones".)
  ☐ El curso consiste principalmente en las prácticas por lo que no se puede realizar en línea.
  ☐ Nos faltan equipos y conocimientos necesarios para la implementación remota.

  Otras razones: Haga clic o pulse aquí para escribir texto.

3. Coméntennos del curso (s) de la Capacitación para Terceros Países en las regiones de Latinoamérica y el Caribe que se tenía planeado su implementación para el año fiscal 2020 y que no se pudo llevar a cabo. Mencionen su razón también. (Se pueden contestar múltiples respuestas.)

Nombre del curso de la capacitación	País anfitrión	Países participantes
Nombre del curso	País anfitrión	Países participantes

- Razón por la que no se pudo llevar a cabo (Se pueden contestar múltiples respuestas.):

  ☐ Deseamos realizarlo de manera presencial en lugar de en línea. (Favor de describir su razón en el espacio abajo de "Otras razones".)
  ☐ El curso consiste principalmente en las prácticas por lo que no se puede realizar en línea.
  ☐ Nos faltan equipos y conocimientos necesarios para la implementación remota.

  Otras razones: Haga clic o pulse aquí para escribir texto.

4. **Si tienen alguna opinión o solicitud relacionada con la implementación en línea de la Capacitación para Terceros Países en las regiones de Latinoamérica y el Caribe en que se aprovecha la ICT, escríbannos en el siguiente espacio.**

Haga clic o pulse aquí para escribir texto.

Agradecemos mucho su colaboración para contestar esta encuesta.

4. Questionnaire on remote implementation of Technical Cooperation Projects, for JICA person in charge (English)

Data Collection Survey for Introducing a New Efficient Model of Remote Work to Implement JICA Projects/Activities in the Latin America and Caribbean Areas

Questionnaire concerning Remote Implementation of Technical Cooperation Projects/Activities

Persons in charge of Technical Cooperation Projects/Activities,

This questionnaire is intended to ask about current conditions concerning the remote implementation of Technical Cooperation Projects/Activities now being implemented in Latin America and the Caribbean, and to identify needs regarding Proof of Concept (PoC) of remote implementation using ICT in the above survey. We would greatly appreciate it if you could take the time to cooperate with and respond to the questionnaire. (Please return to latin_ict@jds21.com.)

Name of responding person: Click or tap here to enter text.
Affiliated department of responding person: Click or tap here to enter text.
Email address of responding person: Click or tap here to enter text.

1. **Out of the Technical Cooperation Projects/Activities you have taken charge of in Latin America and the Caribbean, have there been any Projects/Activities where remote implementation has been adopted following outbreak of the COVID-19 pandemic? (Multiple answers are possible) If you have already responded in a previous questionnaire, there is no need to respond again).**

- Name of Technical Cooperation Project (Also give the country name):

  Click or tap here to enter text.

- What were the contents of remote implementation in that Project/Activity? Please answer to the extent of your knowledge.

  Click or tap here to enter text.

2. **Apart from the cases indicated above, are there any other Technical Cooperation Projects/Activities in which remote implementation is planned from now on? (Multiple answers are possible)**

- Name of Technical Cooperation Project (Also give the country name):

  Click or tap here to enter text.

- What contents of remote implementation are planned? Please answer to the extent of your knowledge.

  Click or tap here to enter text.

3. Have there been any Technical Cooperation Projects/Activities where remote implementation was considered but couldn't be realized (or it is not scheduled for implementation)? (Multiple answers are possible)

- Name of Technical Cooperation Project (Also give the country name):

  Click or tap here to enter text.

- Please indicate, to the extent of your knowledge, the reasons why remote implementation has not been possible. (For example, internet line cannot be secured; the training mainly entails practical work, hence the technology cannot be transferred remotely, etc.)

  Click or tap here to enter text.

4. In this survey, it is scheduled to implement Proof of Concept (PoC) concerning the feasibility of remotely implementing Technical Cooperation Projects/Activities utilizing ICT tools, etc. Please indicate whether any of the Technical Cooperation Projects/Activities under your charge may be targeted for such a PoC. Apart from the PoC contents indicated here, you could also indicate more detailed needs in a separate online meeting where necessary. Please indicate any needs in the section for writing ideas.

- Contents of the PoC currently envisaged (please tick the items that interest you)
  (multiple answers possible)

  ☐ Technology transfer utilizing remote education (e-learning)
  ☐ Securing of Project/Activity-dedicated internet lines for areas where the internet environment is fragile
  ☐ Remote monitoring of Project/Activity sites utilizing ICT devices
  ☐ Introduction of ICT devices/services, etc. necessary for the remote implementation of Projects/Activities (support)
  ☐ Remote support of on-site practical training using VR/AR, etc.

- Name of Technical Cooperation Project that is a possible target for PoC:

  Click or tap here to enter text.

- Please indicate any ideas you may have concerning the specific contents of PoC.

  Click or tap here to enter text.

5. **If you have any other opinions/requests concerning remote implementation of Technical Cooperation Projects/Activities using ICT in Latin America and the Caribbean, please write them below.**

Click or tap here to enter text.

Thank you for your cooperation

5. Questionnaire on remote monitoring of Financial Cooperation Projects (Portuguese)

Pesquisa/coleta de dados para introdução do novo modelo eficiente de abordagem remota para implementação de projetos/atividades da JICA na américa latina e caribe

Questionário sobre monitoramento remoto de projetos de cooperação financeira

Aos Srs. responsáveis pela execução do projeto de cooperação financeira,

O presente questionário tem como objetivos pesquisar a situação atual de execução e monitoramento remoto dos projetos de cooperação financeira em curso na América Latina e Caribe bem como verificar suas expectativas em relação à pesquisa sobre monitoramento remoto através da tecnologia de Informação e Comunicação na referida coleta de dados e pesquisas de verificação. Solicitamos sua gentileza e colaboração para responder a presente questionário. (Favor retornar o questionário respondido para latin_ict@jds21.com).

Nome do Projeto de Cooperação Financeira (com nome do país):

Clique ou toque aqui para inserir o texto.

Nome completo da pessoa que responde o questionário (responsável):

Clique ou toque aqui para inserir o texto.

Nome da organização a que a pessoa acima pertence (empresa, entidade, etc):

Clique ou toque aqui para inserir o texto.

Endereço de e-mail da pessoa acima:

Clique ou toque aqui para inserir o texto.

1. Existem, em seu projeto de cooperação financeira, atividades realizadas de forma remota por conta da pandemia do COVID-19? Caso afirmativo, poderia informar descrevendo qual atividade e como realizada?

Clique ou toque aqui para inserir o texto.

2. Responda as seguintes perguntas sobre as condições do (s) local (is) onde o projeto é realizado e a conexão à Internet.

- Que tipo de localidade o projeto é realizado? (pode ser escolhida mais de uma alternativa).

☐ Zona urbana ☐ Periferia urbana ☐ Pequeno município ☐ Zona rural
☐ Região serrana ou florestal

Outros: Clique ou toque aqui para inserir o texto.

- Informe o tamanho da área aproximado do local (área em m2, dimensão – comprimento x largura, etc)

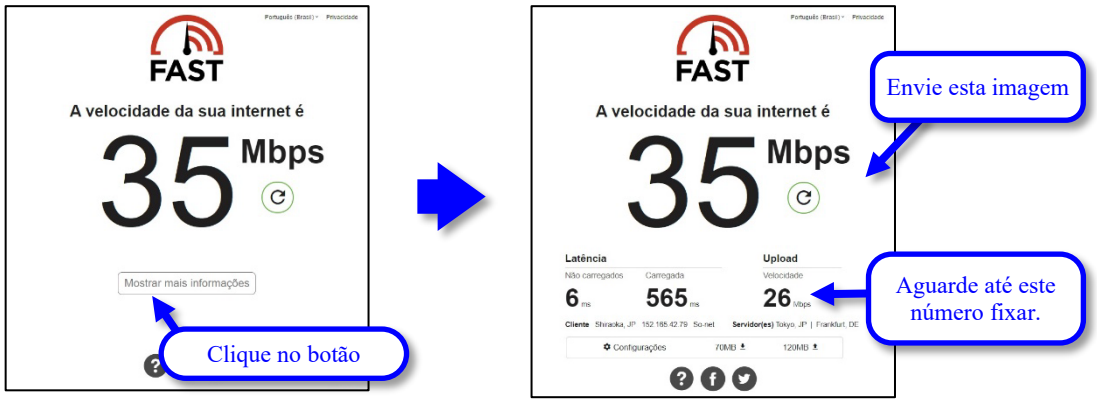
  Clique ou toque aqui para inserir o texto.

- Escritório local (canteiro de obra, etc) dispõe de conexão à Internet?

  ☐ Fibra ótica ☐ ADSL ☐ Wi-Fi mas desconheço o tipo de conexão
  ☐ Não dispõe

  Outros: Clique ou toque aqui para inserir o texto.

- Solicitamos a quem respondeu que tem a conexão, acesse no Wi-fi pelo celular ou computador ao web-site fast.com, visualize a imagem abaixo, registre no *screenshot* e no envie.



- Dispõe de conexão no ambiente externo do local do projeto?
  (pode ser escolhida mais de uma alternativa).

  ☐ via cellular (☐ 5G/☐ 4G (por exemplo LTE)/☐ 3G/☐ 2G/☐ não sabe)
  *LTE = *Long Term Evolution*
  ☐ Sem conexão à Internet mas é possível falar por celular
  (☐ Consegue receber mensagem de SMS)

  Outros: Clique ou toque aqui para inserir o texto.

3. **Planejamos, através da presente pesquisa, verificar as seguintes informações relacionadas à viabilidade de monitoramento remoto, por meio de ferramentas da TIC, de projetos de cooperação financeira. Por favor, nos contatem caso queira realizar esta pesquisa de verificação para seu projeto. Caso queira discutir os assuntos não abordados neste documento, podemos agendar a reunião online. Solicitamos que nos informe suas dúvidas ou expectativas no item de "Livre preenchimento de suas Ideias e opiniões".**

- Escopo de pesquisa de verificação que o (a) senhor(a) visualiza no momento (pode ser escolhida mais de uma alternativa).

  ☐ Monitoramento remoto do local por drone.
  ☐ Monitoramento remoto do local por câmera vestível.
  ☐ Monitoramento remoto do local por camera e/ou sensor fixo instalado.

- Caso possua ideias concretas para monitoramento remoto do local do projeto, por favor as descreva.

  Clique ou toque aqui para inserir o texto.

4. **Escreva, de forma livre, suas opiniões e/ou expectativas em relação a realização, de forma remota, de projetos de cooperação financeira através da TIC na América Latina e Caribe.**

   Clique ou toque aqui para inserir o texto.

Muito obrigado por sua colaboração.

6. Questionnaire on improvement of IT Literacy of staff in JICA Overseas Offices (Spanish)

Estudio de recopilación de datos para introducir un nuevo modelo eficiente de trabajo remoto para la implementación de los proyectos/actividades de JICA en las áreas de Latinoamérica y el Caribe

Encuesta sobre el fortalecimiento en la alfabetización en TI *(IT literacy)* del personal local de las oficinas fuera de Japón

Estimados Señores de las oficinas de JICA en las regiones de Latinoamérica y el Caribe:

Por medio de la presente les enviamos un cordial saludo y aprovechamos la ocasión para solicitar su colaboración para contestar la siguiente encuesta. Estamos realizando el estudio arriba mencionado y dentro de las actividades relacionadas del estudio queremos hacer un estudio de validación sobre los intereses en el "fortalecimiento en la alfabetización en TI (*IT literacy*) del personal local de las oficinas fuera de Japón. (Favor de enviar la respuesta al correo siguiente electrónico: latin_ict@jds21.com)

Nombre completo de la persona que contesta esta encuesta:

Haga clic o pulse aquí para escribir texto.

Organismo y el departamento al que pertenece la persona que contesta:

Haga clic o pulse aquí para escribir texto.

Correo electrónico de la persona que contesta:

Haga clic o pulse aquí para escribir texto.

1. **Dentro de las actividades del estudio de validación que realizaremos (sobre el fortalecimiento en la alfabetización en TI del personal local de las oficinas de JICA fuera de Japón), ¿qué tipo de contenidos desea que elaboremos? (Favor de seleccionar solamente una respuesta.)**

   ☐ Introducción a la Computadora Personal/ Para los principiantes/ Contenidos para aprender los conocimientos TI mínimos necesarios para el desempeño laboral.

   ☐ Para aquellos que quieran utilizarlo para su trabajo / Contenidos para aprender los conocimientos TI algo aplicados.

2. **¿Qué tipo de contenidos desea que elaboremos para el estudio de validación? (Puede seleccionar múltiples respuestas.)**

   Nota: Los métodos y formas de uso de los sistemas y software que se usan en la red de JICA no son objeto para este estudio de validación.

   ☐ Métodos y formas de operación y configuración general de Windows 10.

   ☐ Uso de keyboard y mouse (incluyendo tecla de atajo como Ctrl+C/Ctrl+V).

- ☐ Manejo de carpetas y archivos (por ejemplo, la estructura de las carpetas dentro de PC, las formas de búsqueda u ordenamiento de los archivos, etc.)
- ☐ Forma de configurar la impresora (Conocimientos básicos comunes sin importar el modelo de la impresora)
- ☐ Forma de configurar Wifi y LAN (red de área local) (Incluyendo conocimientos básicos mínimos necesarios de la red).
- ☐ Forma de uso del control de panel (Por ejemplo, configuración de uso frecuente, etc.)
- ☐ Forma de copia de seguridad/ restauración / actualización del sistema, etc.
- ☐ Tips y conocimientos útiles para realizar más eficientemente el trabajo.

Otros: Haga clic o pulse aquí para escribir texto.

☐ Métodos y formas de operación y/o configuración de Microsoft Office (Favor de describir los detalles concretos que desea que incluyamos en el estudio de validación.)

- ☐ Word: Haga clic o pulse aquí para escribir texto.
- ☐ Excel: Haga clic o pulse aquí para escribir texto.
- ☐ PowerPoint: Haga clic o pulse aquí para escribir texto.

Otros: Haga clic o pulse aquí para escribir texto.

☐ Introducción al internet (Contenido de tipo lectivo que enseña la forma de uso, buenos modales, el mecanismo básico de internet, etc.)

☐ Introducción a la seguridad de la información (Contenido de tipo lectivo que enseña los conceptos básicos, la amenaza de ataque cibernético y sus contramedidas, etc.)

☐ Introducción a las tendencias a la vanguardia de TI (Contenido de tipo lectivo que presenta las tendencias de TI como DX, AI, IoT, nube, *big data*, etc.)

☐ Introducción a la comunicación con el personal técnico en TI (Contenido de tipo lectivo que enseña los términos técnicos comúnmente utilizados por el técnico en TI.)

☐ Introducción a LMS (Sistema de Gestión de Aprendizaje) (Curso introductorio para los que utilizan por primera vez LMS, mediante Google Classroom y/o Moodle)

☐ Introducción al uso de software de edición de video (Curso introductorio para los que utilizan por primera vez los softwares adicionales de OS como iMovie y/o Photo.)

☐ Cómo seleccionar equipos TIC de acuerdo con el objetivo del trabajo, y conocimientos básicos sobre equipos TIC básicos y sus funciones.

☐ Introducción y uso de herramientas TI y servicios relacionados con la traducción automática/subtitulación automática/interpretación simultánea (introducción al uso de servicios como YouTube, Google, Amazon, etc.)

Otros: Haga clic o pulse aquí para escribir texto.

Final

7. Questionnaire for feedback on Demonstration survey 4 (Spanish)

Estudio de recopilación de datos para introducir un nuevo modelo eficiente de trabajo remoto para la implementación de los proyectos/actividades de JICA en las áreas de América Latina y el Caribe

Encuesta para el mejoramiento de la alfabetización digital para el personal local en las oficinas de JICA fuera de Japón.

A las personas de las oficinas locales de JICA en América Latina y el Caribe,

La presente encuesta, dentro del Estudio arriba mencionado y con el objeto de resumir los resultados del Estudio de prueba de concepto para "el mejoramiento de la alfabetización digital para el personal local de JICA fuera de Japón", es para preguntar sobre la participación del curso en línea utilizando JICA-VAN en la presente ocasión. Sabemos lo atareados que se encuentran, y les agradecemos sinceramente su colaboración para responder a las preguntas de esta encuesta. (Por favor envíen la encuesta con respuesta a la dirección de correo latin_ict@jds21.com, antes de***l viernes 26 de noviembre*** del presente año).

Nombre y apellido del encuestado (a): Haga clic o pulse aquí para escribir texto.
Institución y departamento al que pertenece: Haga clic o pulse aquí para escribir texto.
Dirección de correo electrónico del encuestado (a): Haga clic o pulse aquí para escribir texto.

1. ¿Cómo participó en el curso de contenidos del estudio de prueba de concepto? (Puede marcar varias respuestas.)

☐ Participé en el curso de JICA-VAN
☐ Participé (observé y escuché) por YouTube
☐ No he participado (No pude participar)

La persona que respondió que ha participado por YouTube o que no ha participado, por favor escriba el motivo:
Haga clic o pulse aquí para escribir texto.

2. ¿Dónde participó en el curso de contenidos del estudio de prueba de concepto? (Puede marcar varias respuestas.)

☐ Participé desde la oficina utilizando la computadora para el trabajo.
☐ Participé desde mi casa utilizando mi computadora personal.

Otros: Haga clic o pulse aquí para escribir texto.

3. **La persona que ha participado en el curso por JICA-VAN, ¿qué le pareció el desempeño y la operabilidad de JICA-VAN? (Marque solamente una respuesta.)**

☐ Era muy fácil de operar.
☐ Era fácil para operar.
☐ Era normal.
☐ Era difícil para operar.
☐ Era muy complicado para operar.

Comentario: Haga clic o pulse aquí para escribir texto.

4. **De la persona que ha participado en el curso por JICA-VAN, ¿qué tanto ha utilizado la comunidad JICA-VAN? (Marque solamente una respuesta.)**

☐ He utilizado todas las veces.
☐ He utilizado a veces.
☐ No he utilizado.

Comentario: Haga clic o pulse aquí para escribir texto.

5. **Los contenidos del estudio de prueba de conceptos se han elaborado con el servicio de voz de la inteligencia artificial. ¿Qué le pareció la calidad de la voz?**
(Marque solamente una respuesta.)

☐ Era muy fácil de escuchar.
☐ Era fácil de escuchar.
☐ Era normal.
☐ Era difícil para escuchar
☐ Era muy difícil para escuchar.

Comentario: Haga clic o pulse aquí para escribir texto.

6. **¿Los contenidos en general del estudio de prueba de concepto han sido útiles para el mejoramiento de la alfabetización digital? (Marque solamente una respuesta.)**

☐ Sí, fueron muy útiles.
☐ Sí, fueron útiles.
☐ No puedo decir sí o no.
☐ No fueron tan útiles.
☐ No fueron útiles para nada.

Comentario: Haga clic o pulse aquí para escribir texto.

7. ¿Qué le ha parecido el nivel en general de los contenidos del estudio de prueba de concepto (nivel de dificultad)? (Marque solamente una respuesta.)

- ☐ Fueron muy difíciles.
- ☐ Fueron difíciles.
- ☐ Fueron normales.
- ☐ Fueron fáciles.
- ☐ Fueron muy fáciles.

Comentario: Haga clic o pulse aquí para escribir texto.

8. En adelante, en caso de elaborar estos contenidos con más detalles para el aprendizaje real, ¿cuáles temas desea que se hagan? (Puede marcar varias respuestas.)

- ☐ Métodos de operación y configuración en general de Windows10/11
  - ☐ Manejo del teclado y el ratón
    (incluyen los teclados de atajos como teclados Ctrl+C/ Ctrl+V)
  - ☐ Manejo de carpetas y archivos
    (Estructura de las carpetas dentro de la PC, métodos para búsqueda, ordenamiento, etc.)
  - ☐ Método para configurar la impresora
    (lo que se debe saber sin tener que ver con la marcas o tipos de la impresora)
  - ☐ Métodos para configurar Wi-Fi y LAN
    (incluyendo los conocimientos básicos mínimo necesarios de la red digital)
  - ☐ Método para usar el panel de control (configuración de uso frecuente, etc.)
  - ☐ Métodos para respaldo / recuperación / actualización del sistema, etc.
  - ☐ Trivias y tips de Windows que son útiles para la eficientización de los trabajos.

  Otros: Haga clic o pulse aquí para escribir texto.

- ☐ Métodos de operación y configuración de Microsoft Office
  (Escriba los contenidos específicos que desea que se incluyan.)
  - ☐ Word: Haga clic o pulse aquí para escribir texto.
  - ☐ Excel: Haga clic o pulse aquí para escribir texto.
  - ☐ PowerPoint: Haga clic o pulse aquí para escribir texto.

  Otros: Haga clic o pulse aquí para escribir texto.

- ☐ Introducción al internet
  (forma de operar y buenos modales de uso, sistema o mecanismo básico, etc.)
- ☐ Introducción a la seguridad de la información
  (conceptos básicos, amenaza de ciberataques y su contramedida, etc.)

☐ Introducción a las últimas tendencias de TI
(presentación de corrientes de TI como DX=Transformación digital, AI=Inteligencia Artificial, IoT=Internet de las cosas, nube, macrodatos, etc.)

☐ Introducción a la comunicación con personas que trabajan en la industria de TI
(presentación de la terminología de uso frecuente por ellos)

☐ Introducción a LMS (presentación de LMS a quienes lo utilizan por primera vez)

☐ Introducción al software de edición de videos
(presentar software perteneciente a OS como iMovie y Photo)

Otros: Haga clic o pulse aquí para escribir texto.

9. ¿Qué sería necesario para el mejoramiento de la alfabetización digital (mejoramiento de habilidades en TI) en el futuro? (Puede marcar varias respuestas.)

☐ Materiales didácticos de E-learning que utiliza JICA-VAN como los que han preparado en esta ocasión (Curso bajo demanda)

☐ Cursos y seminarios en línea por instructores y expertos de TI (Curos en tiempo real)

☐ Introducción del sistema de certificación que compruebe la alfabetización digital
(Sistema de exámenes para la certificación, etc.)

☐ Participación en capacitación y seminarios externos de TI (Cursos presenciales en aulas)

☐ Participación en capacitación y seminarios externos de TI (Cursos en línea en tiempo real)

☐ Participación en cursos de E-learning externos (Cursos bajo demanda)

Otros: Haga clic o pulse aquí para escribir texto.

Fin.