



TRAINING AND DIALOGUE PROGRAMS

GENERAL INFORMATION ON

**Improving Teaching Methods in Science and Mathematics
in Primary Education**

**集団研修「初等理数科教授法」
JFY 2009**

<Type: Solution Creation / 類型: 課題解決促進型>

Course No. J0900927 Program No. 0980078

From Dec 2009 to June 2010

Phase in Japan: From Jan 23, 2010 to Mar 6, 2010

This information pertains to one of the Training and Dialogue Programs of the Japan International Cooperation Agency (JICA), which shall be implemented as part of the Official Development Assistance of the Government of Japan based on bilateral agreement between both Governments.

I. Concept

Background

Some 771 million of the world's adults are illiterate, and far more do not know how to calculate. They are not only disadvantaged in terms of employment, income and, social status, but are also more susceptible to poverty and illness. Basic education provides children with an opportunity to acquire skills and knowledge needed for their daily lives and prepares them to be full-fledged members of the society.

In 2000, the World Education Forum was held in Dakar, Senegal, and adopted the "Dakar Framework for Action, Education for All: Meeting Our Collective Commitments." In addition, the United Nations Millennium Summit was held in the same year which set eighteen targets to be achieved by 2015. These are known as the "Millennium Development Goals (MDGs)", two of which are directly related to education: 1) ensuring that all boys and girls complete a full course of primary education, 2) eliminating gender disparity in primary and secondary education, preferably by 2005, and at all levels by 2015.

In Education for All, Numeracy has been enhanced as a necessary competency which should be developed as well as Literacy. Even if Numeracy is the word which is focused on Mathematical literacy for general use, Numeracy is developed through whole subjects at primary schools and it is necessary to learn Science. Numeracy, or Mathematical literacy, is not limited as the academic discipline of mathematics even if it is taught from the beginning of primary schools. Science is one of the key subjects to develop Numeracy in later half of the primary schools. Thus, quality of education in mathematics and science is vital for countries to pursue the progress in science and technology and to achieve socio-economic development with the growth of economy.

The quality of teachers is one of the most critical factors in improving the quality of education. This program aims to ensure capacity building of participants to improve the quality of primary education specially focusing on Mathematics and Science.

For what purpose?

This program aims to share and discuss Action Plan in respective participants' organizations which explains teaching methods in Science and Mathematics to improve students' mathematical thinking and independent learning.

For whom?

(1) professors/teachers at pre-service teacher training organizations for primary education (universities, teacher training colleges, etc.)

(2) educational administrators responsible for improving school education

(3) instructors at in-service teacher training organizations for primary education

- **Please note this program is targeted at teachers/trainers/instructors of pre/in-service teacher training organizations in relation to developing Numeracy which enhanced the Education for All.**
- **It is not targeted at actual practicing in-service teachers.**

How?

Participants shall have opportunities in Japan to identify approaches that are designed: 1) to enable them to understand a learner-centered approach that engages learners in practical activities and encourages them to think and solve problems for themselves instead of providing them with prescribed knowledge through the teachers, 2) to equip teachers with the skills and knowledge required for Lesson Plan, and 3) to introduce “Lesson Study”¹, which is an approach widely used in Japan to improve the quality of lessons as collaborative activity by teachers.

Participants are required to submit Final Report describing the results of Action Plan, which explains what they do after they go back to their home countries with putting the knowledge and ideas they have acquired and discussed in Japan.

¹ Lesson Study: A group of teachers get together and one of them demonstrates a lesson in the actual classroom in front of the other participating teachers, who then discuss how to improve the lesson by sharing views and opinions.

II. Description

1. Title (J-No.): Improving Teaching Methods in Science and Mathematics in Primary Education (J0900927)

2. Period of program

Duration of whole program:	Dec 2009 to June 2010
Preliminary Phase: (in a participant's home country)	Dec 2009 to Jan 2010
Core phase in Japan:	Jan 23, 2010 to Mar 6, 2010
Finalization Phase: (in a participant's home country)	Mar 2010 to June 2010

3. Target Regions or Countries:

Pakistan, Micronesia, Vanuatu, Palau, Mexico (2), Bolivia, Iraq (2), South Africa, Angola

4. Overall Goal:

To improve teaching methods in Science and Mathematics in respective participants' organizations.

5. Program Objective:

To share and discuss Action Plan in respective participants' organizations which explains teaching methods in Science and Mathematics to improve students' mathematical thinking and independent learning.

* Action Plan: In this program, "Action Plan" is expected to be a "teacher training plan".

6. Outputs:

Participants are expected to achieve the following outputs;

- (1) To understand current situation and challenges of teaching methods in Science and Mathematics in respective participants' organizations
- (2) To understand the role of Lesson Study on Japanese education improvement.
- (3) To understand curriculum of Mathematics and Science in Japan
- (4) To acquire necessary knowledge and know-how to make Lesson Plan of Mathematics.
- (5) To acquire necessary knowledge and know-how to implement Lesson Study of Mathematics.
- (6) To develop Action Plan (draft) and Contents of teacher training for teaching methods in Science and Mathematics in respective participants' organizations.

II In the home country of each participant, it is also expected that Final Report to be authorized by the organization concerned and to be submitted to the local JICA Office or

Embassy of Japan in your country.

7. Eligible / Target Organization :

This program is designed for:

- (1) pre-service teacher training organizations for primary education,
- (2) educational administrations responsible for improving school education
- (3) in-service teacher training organizations for primary education,

7. Total Number of Participants :

11 participants

8. Language to be used in this project: English

9. Contents:

This program consists of the following components. Details on each component are given below:

<p>(1) Preliminary Phase in a participant's home country (Dec 2009 to Jan 2010) <i>Participating organizations carry out the required preparation for the program in their respective country.</i></p>	
Modules	Activities
<p>Inception Report</p>	<p>Inception Report should be prepared by the time of your arrival in Japan. It should be prepared in accordance with the instructions provided in ANNEX 2. In addition, at the beginning of the training program in Japan, each participant is to make a presentation for 15 minutes. The presentation must be prepared using MS Power Point with not more than 10 slides)</p>

<p>(2) Core Phase in Japan (Jan 23, 2010 to Mar 6, 2010) <i>Participants dispatched by their organizations attend the program implemented in Japan. There may be minor changes in the program.</i></p>		
Modules	Subjects/Agendas	Methodology
<p>1)To understand current situation and challenges of teaching methods in Science and Mathematics in respective participants' organizations.</p>	<p>- Presentation and discussion on Inception Report *Please see ANNEX 2 for details.</p>	<p>Presentation Discussion</p>

2) To understand the role of Lesson Study on Japanese education improvement.	<ul style="list-style-type: none"> - Pre-Service and in-Service teacher training system in Japan - Lesson Study in Japan - Control and realization of the curriculum - Observation at primary schools in Japan and teacher training center 	Lecture Observation Discussion
3) To understand curriculum of Mathematics and Science in Japan.	<ul style="list-style-type: none"> - Textbooks, teaching materials of Mathematics and Science - Education curriculum and achievement tests <ul style="list-style-type: none"> -Education in primary level in Japan - Class observation of Mathematics and Science classes - Visiting textbook company 	Lecture Observation Workshop Discussion
4) To acquire necessary knowledge and know-how to make Lesson Plan of Mathematics.	<ul style="list-style-type: none"> - teaching methods in Mathematics and Science - research on teaching materials - observation at Mathematics and Science classes at primary/secondary schools in Japan - making Lesson Plan 	Lecture Observation Discussion Practice
5) To acquire necessary knowledge and know-how to implement Lesson Study of Mathematics.	-Lesson Study of Mathematics at primary school in Japan	Practice
6) To develop Action Plan (draft) and Contents of teacher training for teaching methods in Science and Mathematics in respective participants' organizations.	<ul style="list-style-type: none"> - Summarize the outputs of this training course and make Contents - Make Action Plan (draft) <p>*when the participants prepare Action Plan, they are required to add information and knowledge they have acquired through the course</p>	Lecture Discussion Workshop

***Mathematics Education is more focused than Science Education in this training course.**

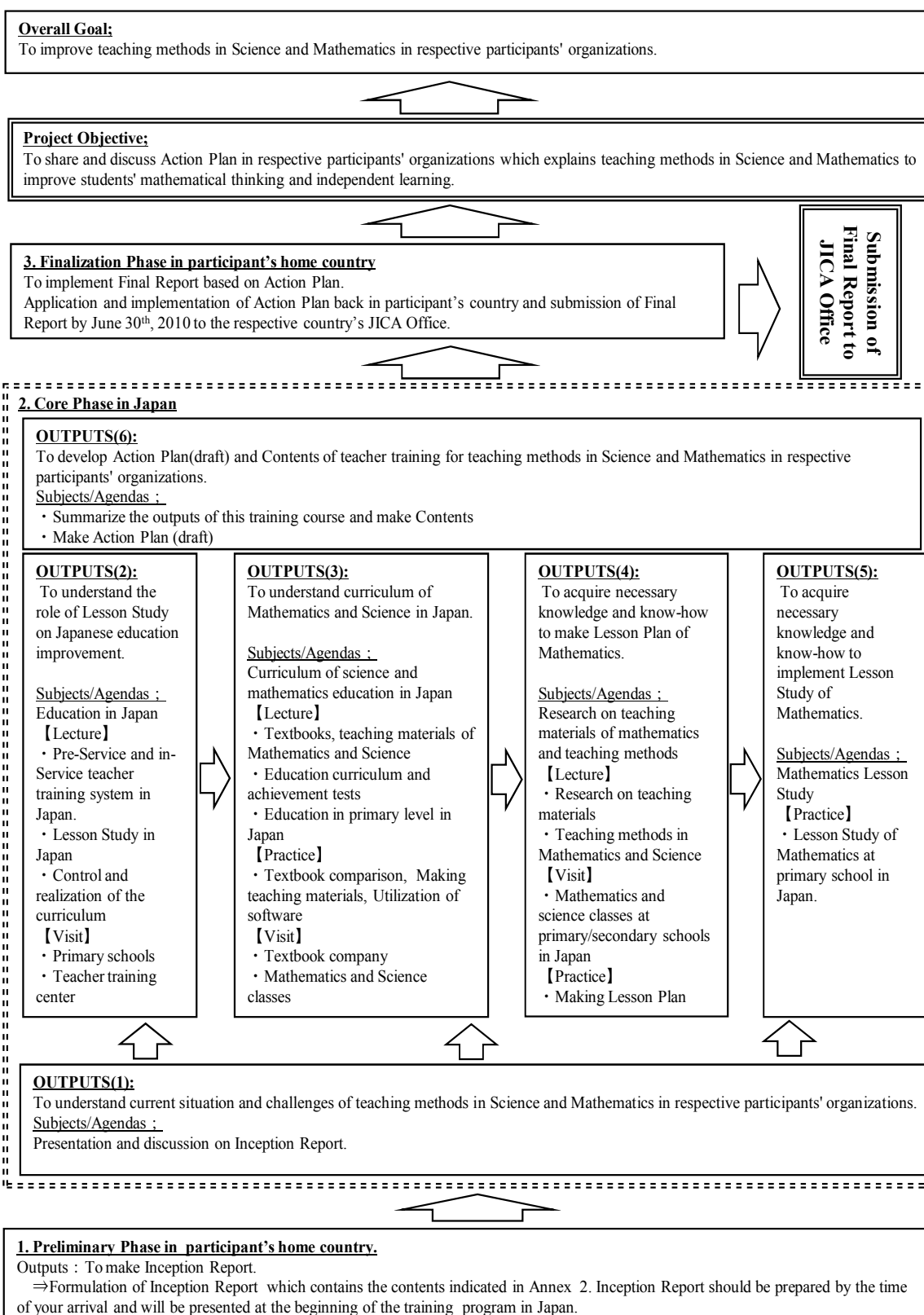
(4)Finalization Phase in a participant's home country

Participating organizations produce final outputs by making use of the results brought back by the participants. This phase marks the end of the program.

Modules	Activities
Authorization of Final Report	(1)sharing information and idea of Action Plan in your organization

<p>(deadline: 30 Jun, 2010)</p>	<p>(2)implementation of Action Plan as a trial (3)submission of Final Report based on the result of implementation of Action Plan</p> <p>Each participant of this course will present a report and draft Action Plan in his/her own organization and finalize it as the authorized plan toward the promotion of improvements in teaching methods for mathematics classes. The authorized Final Report should be submitted to the respective country's JICA Office or Embassy of Japan in your country by June 30th, 2010.</p>
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Structure of the Program



III. Conditions and Procedures for Application

1. Expectations for the Participating Organizations:

- (1) This program is designed primarily for organizations that intend to address specific issues or problems identified in their operation. Participating organizations are expected to use the program for those specific purposes.
- (2) This program is enriched with contents and facilitation schemes specially developed in collaboration with relevant prominent organizations in Japan. These special features enable the project to meet specific requirements of applying organizations and effectively facilitate them toward solutions for the issues and problems.
- (3) As this program is designed to facilitate organizations to come up with concrete solutions for their issues, participating organizations are expected to make due preparation before dispatching their participants to Japan by carrying out the activities of the Preliminary Phase described in section II -9 .
- (4) Participating organizations are also expected to make the best use of the results achieved by their participants in Japan by carrying out the activities of the Finalization Phase described in section II -9.

2. Nominee Qualifications:

Applying Organizations are expected to select nominees who meet the following qualifications.

(1) Essential Qualifications

1) Applicants should fulfill at least one of the following duties:

- (1) professors/teachers at pre-service teacher training organizations for primary education (universities, teacher training colleges, etc.)
- (2) educational administrators responsible for improving school education
- (3) instructors at in-service teacher training organizations for primary education

*** Please note this program is targeted at teachers/trainers/instructors of pre/in-service teacher training organizations in relation to developing Numeracy which enhanced the Education For All.**

● **It is not targeted at actual practicing in-service teachers.**

- 2) Experience in the relevant field: have more than three years experience in teaching primary education teachers, or a teacher trainer who has an experience as a primary school teacher more than ten years
- 3) Language: proficient in spoken and written English (an inadequate command of English will hinder training as well as their daily life in Japan)
- 4) Health: must be in good health, both physically and mentally, to participate in the program in Japan
- 5) Must not be serving any form of military service.

※Pregnancy : Pregnant participants are strictly requested to complete the required procedures before departure in order to minimize the risk for their health. The procedures include ①letter of the participant's consent to bear economic and physical risks ②letter of permission from the participant's supervisor ③letter of consent from your Embassy in Japan, ④medical certificate. Please ask National Staffs in JICA office for the details.

(2) Recommendable Qualifications

Age: be between the ages of twenty-eight (28) and forty-five (45) years

3. Required Documents for Application

Following 2 items must be submitted to the respective country's JICA Office or Japanese Embassy in their countries.

NOTE: Applications without these items will be out of the selection process

(1) **Application Form:** The Application Form is attached to this General Information.

(2) **ANNEX 1 (Format of Application Report)**

4. Procedure for Application and Selection :

(1) Submitting the Application Documents:

Closing date for application to JICA Center in JAPAN: Sep 30, 2009

Note: Please confirm the closing date set by the respective country's JICA office or Embassy of Japan of your country to meet the final date in Japan.

(2) Selection:

After receiving the document(s) through due administrative procedures in the respective government, the respective country's JICA office (or Japanese Embassy) shall conduct screenings, and send the documents to the JICA Center in charge in Japan, which organizes this program. Selection shall be made by the JICA Center in consultation with the organizations concerned in Japan based on submitted documents according to qualifications. *The organization with intention to utilize the opportunity of this program will be highly valued in the selection.*

(3) Notice of Acceptance

Notification of results shall be made by the respective country's JICA office (or Embassy of Japan) to the respective Government by **not later than Nov 20, 2009.**

5. Document(s) to be submitted by accepted participants:

Inception Report:

Before coming to Japan, only accepted participants are required to prepare Inception Report (detailed information is provided in the ANNEX 2 "Inception Report".) Inception Report should be submitted upon his/her arrival in Japan. At the beginning of the training program in Japan, each participant is to present his/her presentation for 15 minutes. In addition, the accepted participants are required to bring mathematics textbooks when they come to Japan.

6. Conditions for Attendance:

- (1) to observe the schedule of the program,
- (2) not to change the program subjects or extend the period of stay in Japan,
- (3) not to bring any members of their family,
- (4) to return to their home countries at the end of the program in Japan according to the travel schedule designated by JICA,
- (5) to refrain from engaging in political activities, or any form of employment for profit or gain and,
- (6) to observe the rules and regulations of their place of accommodation and not to change the accommodation designated by JICA
- (7) to participate the whole program including a preparatory phase prior to the program in Japan. Applying organizations, after receiving notice of acceptance for their nominees, are expected to carry out the actions described in section II -9 and section III -5.

IV. Administrative Arrangements

1. Organizer:

(1) **Name:** JICA Tsukuba

(2) **Contact:**

KODA Sayuri (Ms.) (jicatbic@jica.go.jp)

2. Implementing Partner:

(1) **Name:** Center for Research on International Cooperation in Educational Development, University of Tsukuba (CRICED)

(2) **URL:**

<http://www.criced.tsukuba.ac.jp/en/index.htm>

<http://math-info.criced.tsukuba.ac.jp/>

(3) **Remark:** CRICED is an institution which plays the roles of core institutions for international education cooperation. The CRICED aims to promote research on educational development and research of training models and teaching materials in areas such as education for children with mathematics and science education, IT education, Educational Administration, and Special needs education in order to contribute to human resource development in education.

3. Travel to Japan:

(1) **Air Ticket:** The cost of a round-trip ticket between an international airport designated by JICA and Japan will be borne by JICA.

(2) **Travel Insurance:** Term of Insurance: From arrival to departure in Japan. *the traveling time outside Japan shall not be covered.

4. Accommodation in Japan:

JICA will arrange the following accommodations for the participants in Japan:

JICA Tsukuba International Center (JICA TSUKUBA)

Address: 3-6 Koyadai, Tsukuba-Shi, Ibaraki, 305-0035, Japan

TEL: +81-29-838-1111 FAX: +81-29-838-1790

(where "81" is the country code for Japan, and "29" is the local area code)

If there is no vacancy at JICA TSUKUBA, JICA will arrange alternative accommodations for the participants.

5. Expenses:

The following expenses will be provided for the participants by JICA:

(1) Allowances for accommodation, living expenses, outfit, and shipping

(2) Expenses for study tours (basically in the form of train tickets.

(3) Free medical care for participants who become ill after arriving in Japan (costs related to pre-existing illness, pregnancy, or dental treatment are not included)

(4) Expenses for program implementation, including materials

For more details, please see p. 9-16 of the brochure for participants titled

“KENSU-IN GUIDE BOOK,” which will be given to the selected participants before (or at the time of) the pre-departure orientation.

6. Pre-departure Orientation:

A pre-departure orientation will be held at the respective country's JICA office (or Japanese Embassy), to provide participants with details on travel to Japan, conditions of the workshop, and other matters.

V. Other Information

1. It is desirable for participants to bring clothes and shoes that can be easily taken off during their stay in Japan due to the custom of removing shoes and outerwear when entering schools, etc. (This training is also held in various cities where it is necessary to move around using trains and buses.) It is also recommended to bring a small/medium-sized bag that participants can use for short trips (approx. for 7~10 days) and slippers for school visits. In addition, warm clothes (coats and etc...) would be very useful during the training.
2. It is desirable for participants to bring a shoulder bag or briefcase that can carry A4 size documents during their stay in Japan

For All Applicants

VI. ANNEX1(Format of Application Report):

The following questionnaire is used for selecting participants for this course. It should be submitted together with Application Form.

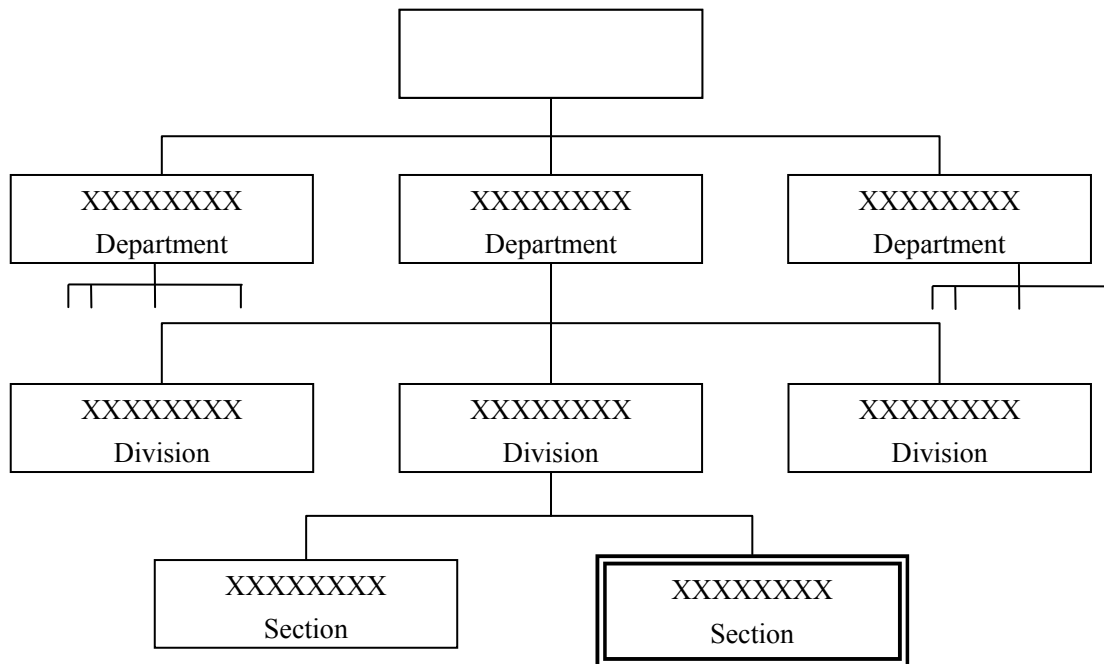
1. General information on an applicant's teaching experience

Name of applicant	
Name of the country	
Applicant's experience	Year(s) of experience teaching pre-service and/or in-service teachers in primary level (mathematics).
	Teaching subject(s); If the applicant has taught more than one subject apart from mathematics to pre-service and/or in-service teachers, please write down the year(s) of teaching experience on each subject.

2. Outline of the participant's organization

Organizational structure of education on the national administrative level including the bureau in charge of primary education, and the participant's position.

<Example>



3. Applicant's teaching method

In relation to the curriculum and textbook;

1) When (which grade) do you begin to teach? And why?

1-1. How do you introduce numbers from the beginning until 100 with relation to addition and subtraction?

1-2. Multiplication and Division

1-3. Decimal numbers and Fractions

2) How do you teach? And why?

2-1. How do you improve the students who are continuously counting at the situation of multiplication?

2-2. How do you introduce or define division?

(The Copy of the textbook is acceptable.)

3) Does every teacher follow curriculum or textbooks? And why?

In relation to the teaching approach

4) Do you have special teaching approach which has been recommended in National level? If you have, please bring the example, if possible with video, and explain why it is recommended.

As a teacher trainer

5) Explain a standard type of teacher training program and if you have special approach for teacher training please explain.

4. Future Plan

Please describe future plan/project which you are likely to be involved, if any

Writing instruction:

1. Please prepare your response in typewritten, double-spaced text on A4 size paper (21cm × 30cm)
2. Summarize your response in a maximum of 3(three) pages

5. Relations with JICA programs

If you have involved in any JICA program/project in your country, please explain what kind of program/project it is and how you have involved in it.

END

Only for Selected participant

VII. ANNEX 2 (Format of Inception Report):

Inception Report for
the Group Training Course on
Improving Teaching Methods in Science and Mathematics
in Primary Education
2009

(1) system of pre-service and in-service teacher training for primary education (within one slide)

- Describe the system of pre-service and in-service teacher training (for primary education) in your country.
- Describe the process of becoming a primary education teacher using a flowchart.

(2) current situation and challenges of teaching methods in mathematics classes for primary education

(3) methods and format of Lesson Plan

(4) outline of your organization (within one slide)

- background, vision, mission of your organization,
- your position and duty in your organization
- budget
- difficulties

(5) activities currently working on to improve the quality of mathematics classes

(6) draft of Action Plan

Note: At the beginning of this course, the participant will be requested to give a presentation for 15 minutes/person (30 minutes/country if there are 2 participants from 1 country) based on the Inception Report. Please prepare and bring a MS Power Point presentation with not more than 10 slides.

END

For Your Reference

JICA and Capacity Development

The key concept underpinning JICA operations since its establishment in 1974 has been the conviction that “capacity development” is central to the socioeconomic development of any country, regardless of the specific operational scheme one may be undertaking, i.e. expert assignments, development projects, development study projects, training programs, JOCV programs, etc.

Within this wide range of programs, Training Programs have long occupied an important place in JICA operations. Conducted in Japan, they provide partner countries with opportunities to acquire practical knowledge accumulated in Japanese society. Participants dispatched by partner countries might find useful knowledge and re-create their own knowledge for enhancement of their own capacity or that of the organization and society to which they belong.

About 460 pre-organized programs cover a wide range of professional fields, ranging from education, health, infrastructure, energy, trade and finance, to agriculture, rural development, gender mainstreaming, and environmental protection. A variety of programs and are being customized to address the specific needs of different target organizations, such as policy-making organizations, service provision organizations, as well as research and academic institutions. Some programs are organized to target a certain group of countries with similar developmental challenges.

Japanese Development Experience

Japan was the first non-Western country to successfully modernize its society and industrialize its economy. At the core of this process, which started more than 140 years ago, was the “*adopt and adapt*” concept by which a wide range of appropriate skills and knowledge have been imported from developed countries; these skills and knowledge have been adapted and/or improved using local skills, knowledge and initiatives. They finally became internalized in Japanese society to suit its local needs and conditions.

From engineering technology to production management methods, most of the know-how that has enabled Japan to become what it is today has emanated from this “*adoption and adaptation*” process, which, of course, has been accompanied by countless failures and errors behind the success stories. We presume that such experiences, both successful and unsuccessful, will be useful to our partners who are trying to address the challenges currently faced by developing countries.

However, it is rather challenging to share with our partners this whole body of Japan’s developmental experience. This difficulty has to do, in part, with the challenge of explaining a body of “tacit knowledge,” a type of knowledge that cannot fully be expressed in words or numbers. Adding to this difficulty are the social and cultural systems of Japan that vastly differ from those of other Western industrialized countries, and hence still remain unfamiliar to many partner countries. Simply stated, coming to Japan might be one way of overcoming such a cultural gap.

JICA, therefore, would like to invite as many leaders of partner countries as possible to come and visit us, to mingle with the Japanese people, and witness the advantages as well as the disadvantages of Japanese systems, so that integration of their findings might help them reach their developmental objectives.



CORRESPONDENCE

For enquiries and further information, please contact the JICA office or the Embassy of Japan. Further, address correspondence to:

JICA Tsukuba International Center (JICA TSUKUBA)
Address: 3-6 Koyadai, Tsukuba, Ibaraki, 305-0035 Japan
TEL: +81-29-838-1111 FAX: +81-29-838-1790