Summary

1. Outline of the Project

Country: Arab Republic of Egypt

Project Title: Project on the Improvement of Science and Mathematics Education in Primary Schools

Issue/Sector: Basic education

Cooperation Scheme: Technical Assistance Project

Division in Charge: JICA Egypt Office

Total cost: 356,479,000 Japanese yen (including 301 million yen of volunteer costs)

Period of Cooperation (Duration):

R/D Signed on: February 19, 2003

Period: April 1, 2003 – March 31, 2006 (three years)

Partner Country's Implementing Organization: National Centre for Educational Research and Development (NCERD)

Supporting Organization in Japan: Hokkaido University of Education

Related Cooperation: Not applicable

1-1 Background of the Project

The modernization of education is a high-priority policy. In the field of science and mathematics education, the qualitative improvement of traditional teaching methods, which have primarily been focused on memorization, is an important issue. In order to introduce teaching methods that place importance on the process of children's thinking and independent problem solving, Japan had dispatched a team of experts for three years from 1997 to 2000 to implement the "Improvement of Science and Mathematics Classes in Primary Schools," and has created instruction manuals for teachers (guidebooks).

With the aim of diffusing this new teaching method, this project was implemented over a three–year period starting from April 2003. The counterpart institution of the project is the National Centre for Educational Research and Development (NCERD), and the project also implemented in partnership with the Cairo Governorate Education Modereya regarding training programs for teachers aimed at diffusing the new teaching method. The project selected four model schools within the Cairo Governorate and sought to introduce a child-centered, problem-solving-oriented curriculum. The project intended to entrench said new teaching method by revising guidebooks created within the rubric of "Improvement of Science and Mathematics

Classes in Primary Schools," by providing practical instruction on teaching methods to teachers in model schools, and by providing opportunities such as open classes for officials in the Ministry of Education and teachers at nearby schools.

1-2 Project Overview

(1) Overall Goal

The new teaching methods that use the guidebooks in science and mathematics education are being used at primary schools in the Cairo Governorate and the target governorates under the Project Planning and Monitoring Unit (PPMU).

(2) Project Purpose

The implementation of the new teaching methods employing the guidebooks in science and mathematics education at the selected schools and the formation of a solid base for further dissemination

(3) Project Outputs

1. The ability of NCERD staff (counterparts) to provide proper instructions to teachers in regards to the new teaching methods, including lesson planning
2. The mastering of the new teaching methods by the teachers at the selected schools and in-class practice thereof
3. The confirmation of the effectiveness of the new teaching methods
4. The revision of the guidebooks
5. The introduction of the new teaching methods into the existing teacher training courses
6. The recognition of the new teaching methods by the people in the field of education

(4) Project Inputs (as of the evaluation)

Japanese side:

Long-term experts	9 persons in total, 151.0M/M in total
Short-term experts	28 persons in total, 46.0M/M in total
No. of trainees received in Japan	19 persons, 12.5M/M in total
Equipment supply	10,174,811 yen

Egyptian Side:

Assignment of counterparts	17 persons in NCERD, 18 teachers
Facilities provided	Office for Japanese experts within NCERD, maintenance cost for equipments supplied by the Japanese side

2. Evaluation Team Overview

Evaluation type: Terminal evaluation

Evaluation Period
From November 5 to November 23, 2005
Members of the evaluation team
Team leader:
Shigeru Okamoto
The Resident Representative of JICA Egypt Office
Education cooperation:
Chisa Hara
Leader of Basic Education Team I, Group I, Human Development Department, JICA
Science education:
Toshio Hasegawa
Professor, Asahikawa Campus of the Hokkaido University of Education
Mathematics education:
Kazuyoshi Okubo
Professor, Sapporo Campus of the Hokkaido University of Education
Planning evaluation:
Kazuhiro Tambara
Basic Education Team I, Group I, Human Development Department, JICA
Effects analysis:
Mitsutaka Hoshi
JICA Egypt Office
Evaluation analysis:
Ayako Watanabe
Regional Planning International Co., Ltd.

3. Overview of Evaluation Results

3-1 Achievements

Output 1. The ability of NCERD staff (counterparts) to provide proper instructions to teachers in regards to the new teaching methods, including lesson planning

All the 17 NCERD counterparts (C/Ps) have attained the capability of providing instructions to teachers based on the concepts of the guidebooks, as well as the ability to give lectures as part of the Cairo Governorate and PPMU's training programs. They are also able to understand the concepts of the teaching methods for child-centered, problem-solving types of learning and reflect the concept within the

instructions given to C/P teachers. 70% of the trainees of the training programs provided by NCERD C/Ps evaluate the training provided as appropriate, showing that the NCERD C/Ps have become capable of providing practical training to teachers.

Output 2. The mastering of the new teaching methods by teachers at the selected schools master the new teaching methods and in-class practice thereof

C/P teachers in the model schools have obtained proper understanding to such an extent that they are reflecting the new teaching method in their use of the guidebooks in their teaching plans. All the C/P teachers are now able to put into practice proper classes based on the teaching plans prepared by the NCERD counterparts. This evaluation is based on the evaluation report submitted by JICA experts three times a year, as well as on yearly changes in the evaluation results of the observation sheet filled in by C/P teachers of the model schools in the form of mutual evaluation.

Output 3. The confirmation of the effectiveness of new teaching methods

Students' understanding of and attitudes and interest toward the subjects showed significant improvement in model schools, based on yearly changes in survey results, and students' interests in mathematics and science increased. According to the results of interviews with C/P teachers in the model schools, all respondents showed favorable attitude towards the new teaching methods, and almost all of them reported the students' increased interests towards science and mathematics.

Output 4. The revision of the guidebooks

The guidebooks have been revised and both the complete version (in English) and the digest version (in Arabic) have been completed.

Output 5. The introduction of the new teaching methods into the existing teacher training courses

Twelve training sessions in total were implemented for teachers in the Cairo Governorate, in which there were about 300 participants in total. Also, the PPMU training sessions for senior teachers and school inspectors throughout the country were implemented on four occasions in total, with 213 people in total participating therein. The new teaching methods are being evaluated quite highly among the training program participants, with 80-90% of participants in training for science and more than 95% of participants in training for mathematics showing satisfaction.

Output 6. The recognition of the new teaching methods by people in the field of education

The index of this output, namely that "500 people in the field of education have recognized the new teaching method," has been achieved. Among the participants in the open classes and PPMU training sessions, as well as officials of the Ministry of Education and NCERD, the number of those who expressed some kind of response to the teaching method in question exceeded 500. Open classes were held on four occasions in total, and more than 90% of about 200 participants highly evaluated the teaching method.

3-2 Summary of Evaluation Results

(1) Relevance: sufficient

Egypt has been focusing on the provision of "primary education for all" since the 1990s, and has been making concerted efforts to upgrade primary-level science and mathematics education. One of the five prioritized fields in JICA's policy for providing support to Egypt is "human resource development and the improvement of education," and JICA is putting special focus on the qualitative improvement of basic education, especially in the areas of mathematics and science. The project, aiming for the qualitative improvement of science and mathematics education in the basic curriculum, is consistent with both the Egyptian and Japanese policies. The techniques and approaches employed in the project are based on the strategy of creating guidebooks, developing instructors and giving instructions to teachers based on said guidebooks. In practical terms, these techniques and approaches can be applied not only to model schools within the Cairo Governorate but throughout Egypt.

(2) Effectiveness: effective for the most part

The project activities have progressed as scheduled for most part, and it is expected that the project's purpose will be achieved. According to the results of surveys extrapolated through questionnaire and interviews, all the NCERD C/Ps and C/P teachers have evaluated the new teaching method favorably, have generally understood the concept of child-centered and problem-solving-oriented learning, and have obtained the capability of preparing teaching plans and applying them in their classes. There were a few C/Ps whose knowledge and technical skills did not reach the targeted level, and as such it is necessary to make further efforts to improve their capabilities during the remaining period of the project.

(3) Efficiency: sufficient

Inputs from both Japanese and Egyptian sides were mostly implemented appropriately. However, there was a case wherein the dispatch of short-term experts had not been sufficiently coordinated between Japan and Egypt in terms of the timing and duration of the dispatch, resulting in the limited improvement of the C/Ps' capabilities as a result of insufficient opportunities for joint activities with the C/Ps. However, during the latter half of the project period, the entire project came together as a team and the C/Ps started showing a positive attitude through measures such as the appointment of group leaders, thorough management of their attendance book, and the improved management of C/P work by those in higher positions such as the Director of the NCERD and the Curriculum Department Manager. As a result, most problems were solved. While in some cases the involvement of the NCERD C/Ps remained only partial, as they were not exclusively assigned to the project, this problem was solved by way of the clarification of the distinction between their roles and those of Japanese experts. While there was a lack of collaboration between institutes other than the NCERD, such as the Ministry of Education, this situation also improved during the latter half of the project period.

(4) Impact

As a positive impact, it can be pointed out that regular meetings among teachers are being held at the model schools with a view to sharing knowledge and skills. Regarding the overall goal, although wide recognition of the effectiveness of the new teaching methods has been found among those in the field of education, actual application of the methods remains limited and is not being adequately diffused to teachers in schools other than the model schools. There were also unexpected positive impacts, such as the consideration by the NCERD C/Ps of an approach to improving the quality of education in an efficient manner, by way of creating teacher groups based on different issues and levels. No negative effects and possibilities thereof have been determined.

(5) Sustainability: high

As for political aspects, the widespread implementation of a child-centered, problem-solving-oriented learning method concurs with the educational policy of Egypt. Thus, it is expected that this kind of policy support will continue even beyond the termination of cooperation. As for the organizational aspects of the project, the NCERD

is planning to continue monitoring the Cairo Governorate training program participants. Teachers' meetings are being held on a regular basis at the model schools for the diffusion of the teaching methods. The Ministry of Education has the idea of broadly disseminating the teaching methods and guidebooks used in the project. However, if the teaching methods and guidebooks are to be applied throughout the curriculum, there will be issues to be addressed such as the time required for the preparation of classes as a result of to the enormous scale of the curriculum, the necessity of developing a system for the evaluation of the involvement of teachers in said teaching methods, and the assurance of the funds necessary for the purchasing of the equipment for experiments. As for financial aspects, the Egyptian side incurred no extra costs beyond the regular payroll as a result of the fact that the C/Ps were engaged in the project activities during office hours. Therefore, no problems occurred in terms of the local costs borne by the Egyptian side. However, in order to ensure diffusion into the future, it is necessary to secure the funds necessary to ensure that the C/Ps can continuously engage in teacher training, including the provision of transportation fees, and the NCERD is responding favorably to this.

3-3 Factors Contributed in the Production of Effect

(1) Planning

No applicable items entered in the Terminal Evaluation Report.

(2) Implementation Process

No applicable items entered in the Terminal Evaluation Report.

3-4 Problems and Factors that Raised Problems

(1) Planning

No applicable items entered in the Terminal Evaluation Report.

(2) Implementation Process

No applicable items entered in the Terminal Evaluation Report.

3-5 Conclusion

In this project, outputs such as revised guidebooks, improvements in the understanding of NCERD C/Ps and C/Ps on the teaching methods and their capability

to put them in practice have been obtained. Through implementation in model schools, open classes and training programs, child-centered, problem-solving-oriented teaching methods have acquired positive recognition from the people concerned such as officials from the Ministry of Education, the Education Department of the governorate and teachers. For further diffusion into the future, there still remain several issues to be addressed, such as the establishment of some kind of authorization for teaching methods and guidebooks and the achievement of coordination between curricula, achievement tests and teacher evaluation.

3-6 Recommendations (Specific Measures, Recommendations and Advices on this Project)

(1) Recommendations regarding project achievements

In order for teachers to apply the teaching methods and guidebooks in their classes, it is necessary that they gain practical experiences through teacher training programs. It is recommended that the capability of C/P teachers in the model schools be upgraded through various teachers training opportunities in order to maintain the achievements derived from this project. The Ministry of Education is supporting various teacher training programs through NCERD and is dispatching human resources and providing equipment and facilities. Such support for the implementation of training, as well as instructions given to teachers by the NCERD C/Ps and the monitoring by school inspectors, will be important into the future.

(2) Recommendations regarding future diffusion

Authorization by the Ministry of Education is essential for the diffusion of teaching methods that utilize the guidebooks. Although the teaching methods are effective, preparation and classes will become more time-consuming for teachers, and it will be difficult to implement these teaching methods for all units within the current curriculum. Therefore, it is recommended that the Ministry of Education realize a system for diffusion, including measures to address this issue. In order to diffuse teaching methods in all governorates, it is important that information on practical knowledge and experiences be provided to teachers through teacher training provided in each governorate. Upon implementing such training, it is necessary that organizational roles (such as those of the Central Department of Basic Education in the Ministry of Education, the NCERD and the Education Department of each governorate) be differentiated in terms of lectures, budgets and logistics.

3-5 Lessons Learned (Matters Helpful for Discovering/Forming Similar Projects Derived from this Project and Implementation, Operation and Administration Thereof)

Output 1. The ability of NCERD staff (counterparts) to provide proper instructions to teachers in regards to the new teaching methods, including lesson planning

Although there are common points in regards to the efforts for cooperation in the education of science and mathematics, in reality the nature of the two subjects differs. Therefore, it is important that the approach to cooperation for both subjects be clarified at the outset of cooperation prior to the implementation of activities.

Output 2. The mastering of the new teaching methods by teachers at the selected schools master and in-class practice thereof.

The accurate understanding of the logical underpinnings of the methodology is essential in order for teachers to acquire the practical methods actually used in classrooms. It is recommended that technical transfers focusing on the logical aspects also be implemented for teachers during the project period.

Output 3. The confirmation of the effectiveness of the new teaching methods

When implementing technical transfer of contents whose effects cannot be measured at a glance, such as teaching methods, the preparation and distribution of simple leaflets and other materials capable of showing the effects thereof in data form will be helpful in the diffusion of such contents.

Output 4. The revision of guidebooks

Upon preparing educational materials covering more than one grade as an output, actual supplementary material can be shown tangibly during the project period through the division of said material by grade and the distribution thereof prior to completion. This will promote further understanding among the parties involved and will be helpful in the diffusion of supplementary materials.

Output 5. The introduction of new teaching methods into the existing teacher training courses

When collaboration with other donors in teachers training takes place, active cooperation should be sought in terms of the monitoring and evaluation activities independently implemented by that donor. It would be efficient and effective to grasp the achievements and accomplishments on the Japanese side as well by taking

advantage of such occasions.

3-6 Follow-ups

No applicable items entered.