

Summary of the Joint Terminal Evaluation

1. Outline of the Project	
Country: United States of Mexico	Project Title: Project for Human Resources Development in the Technology of Plastic Transformation
Issue/Sector: Industrial Development	Cooperation Scheme: Technical Cooperation
Division in Charge: Industrial Development and Public Policy Department	Total Cost (at the time of the Terminal Evaluation): JPY530Million *Expected amount of budget executed by the end of October is included.
Period of Cooperation: (R/D: 20 July 2010) October 2010 - October 2014 (4 years)	Partner Country's Implementing Organization: • National Center for Actualization of Industrial Technical Education (CNAD)
	Supporting Organization in Japan: Japan Development Service, Co., Ltd.
Related Cooperation: n/a	
<p>1-1 Background of the Project</p> <p>In response to the Agreement between Japan and the United Mexican States on the Strengthening of the Economic Partnership (EPA) concluded in April 2005, the Japan's Official Development Assistance (ODA) policy states its further contributions to the socio-economic development in Mexico by supporting its "development of small and medium-sized enterprises (SMEs) and local supporting industries". In Mexico, the number of companies in the field of plastic transformation amounts to approximately 3,500, most of which are classified as SMEs. These companies have difficulties in recruiting qualified workers because skilled labor, especially supervisors, is in short supply. Technological Industrial and Service Studies Centers (CETIS) and Technological Industrial and Service High School Centers (CBTIS), which are expected to provide potential supervisors in the industrial sector, had neither a specific course nor qualified teachers on plastic transformation technology.</p> <p>Under these circumstances, the Government of Mexico requested the Government of Japan to implement "the Project for Human Resource Development in the Technology of Plastic Transformation". It aims at improving the National Center for Actualization of Industrial Technical Education's (CNAD) capacity to train CETIS/CBTIS teachers on plastic injection molding technology. Based on the Record of Discussions (R/D) signed on 20 July 2010, JICA started implementing the Project in October 2010 with the expected duration of four years.</p> <p>With the Project reaching its completion in October 2014, the Terminal Evaluation was conducted by the Joint Terminal Evaluation Team with an aim to verify the achievements of project activities and Outputs based on the Five Evaluation Criteria (explained in this report) as well as to make recommendations on measures to be taken to achieve the Overall Goal after the project completion and obtain lessons learned to formulate and implement projects in the similar field.</p> <p>1-2 Project Overview</p> <p>In order to contribute to the production of qualified technicians for the plastic industry in Mexico, the Project aims to enhance CNAD's capacity to train CETIS/CBTIS teachers for Plastic Transformation Technology Course (BTTP).</p> <p>(1) Overall Goal: CETIS/CBTIS which set up the course of the plastic transformation technology will contribute to turn out the quality labor force to the plastic industry in Mexico.</p> <p>(2) Project Purpose: The capacity to train the instructors of the plastic injection molding technology in CETIS/CBTIS is improved at CNAD.</p> <p>(3) Outputs</p> <p>1) The CNAD instructors become to train the CETIS/CBTIS teachers about the plastic injection</p>	

<p>molding technology.</p> <p>2) The training curriculum which meets the needs of the plastic industry in Mexico for the plastic injection molding technology to train the CETIS/CBTIS teacher is made up at CNAD.</p> <p>3) The training course of plastic injection molding technology for the CETIS/CBTIS teachers is set up and managed efficiently at CNAD.</p> <p>4) The curriculum (theoretical and practical training) of the plastic injection molding technology subject which is set in the plastic transformation technology course at model CETIS/CBTIS selected by Mexican side is made up and improved to meet the needs of the plastic industry in Mexico.</p> <p>5) CNAD's and model CETIS/CBTIS's capacity for promoting linkage with the plastic industry is enhanced.</p> <p>(4) Inputs (as of the time of the Terminal Evaluation)</p> <p>Japanese side:</p> <p>Japanese experts: 6 short-term experts Equipment and materials: USD738,550</p> <p>Training in Japan: 9 trainees Local Expenses: JPY 51 million</p> <p>Mexican side:</p> <p>Counterparts (C/Ps): 11 persons Office space in CNAD for the Project Team</p> <p>Local costs: Mexican Peso (MXN) 496,235</p>
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2. Evaluation Team			
Members of Evaluation Team	<Japanese Side>		
	Mr. Hiroshi Arai	Team Leader	Senior Advisor to the Director General, Industrial Development and Public Policy Department, JICA
	Mr. Naoto Mukai	Cooperation Planning	Advisor, Private Sector Development Group, Industrial Development and Public Policy Department, JICA
	Ms. Kaori Koizumi	Evaluation and Analysis	Analyst, IMG Inc.
	<Mexican Side>		
	Mr. Efraín del Ángel Ramírez	Deputy Director for Bilateral Cooperation with Asia Pacific	Mexican Agency for International Development Cooperation (AMEXCID), Secretary of Foreign Affairs (SRE)
	Ms. Lorena García Nava	Head of the Department of Bilateral Cooperation with Asia Pacific, AMEXCID, SRE	
Ms. Tania Evelyn Sánchez Hernández	Technical Programs Officer, Department of Bilateral Cooperation with Asia Pacific, AMEXCID, SRE		
Mr. Samuel Alcantar Varela	Administrative Subdirector, CNAD		

Evaluation Period: 10 August 2014 – 30 August 2014	Type of Evaluation: Terminal Evaluation
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<p>3. Evaluation Results</p> <p>3-1. Achievements of the Project</p> <p>(1) Achievements of the Outputs</p> <p>Output 1 (The CNAD instructors become to train the CETIS/CBTIS teachers about the plastic injection molding technology.)</p> <p>Assessed from the achievement levels of the two OVIs, Output 1 is judged to have been achieved.</p> <p>All the sessions of training for CNAD instructors were completed by Experts in June 2014. Experts conducted a series of training for nine CNAD instructors, indicating clear goals to be achieved at each stage. Through periodically conducting (theoretical and practical) proficiency tests, Experts checked each instructor's level of understanding and adjusted the contents of the training. As a result, all the</p>
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instructors have reached the required level, becoming able to train CETIS/CBTIS teachers in plastic injection molding technology.

Output 2 (The training curriculum which meets the needs of the plastic industry in Mexico for the plastic injection molding technology to train the CETIS/CBTIS teacher is made up at CNAD.)

Output 2 is judged to have been achieved, based on the achievement levels of the two OVIs.

CNAD, with Experts' assistance, developed a curriculum (Modules I to V) for the training of CETIS/CBTIS for BTTP⁴. Meetings of the Course Curriculum Validation Committee (CVCC), which is responsible to ensure the consistency of the curriculum for the training of CETIS/CBTIS teachers for BTTP with the plastic industry's needs, have been held and approved the curriculum before the commencement of the training of each module.

Output 3 (The training course of plastic injection molding technology for the CETIS/CBTIS teachers is set up and managed efficiently at CNAD.)

Output 3 is judged to have been achieved, based on the achievement levels of the three OVIs.

Through the implementation of training for CETIS/CBTIS teachers, an efficient management as well as a mechanism for evaluation of the training has been established at CNAD.

With Experts' support, CNAD has developed an Implementation Plan, which is used for planning training of CETIS/CBTIS teachers for BTTP. CNAD needs to develop training plans, making use of the Implementation Plan.

Output 4 (The curriculum (theoretical and practical training) of the plastic injection molding technology subject which is set in the plastic transformation technology course at model CETIS/CBTIS selected by Mexican side is made up and improved to meet the needs of the plastic industry in Mexico.)

Output 4 is judged to have been achieved, based on the achievement levels of the three OVIs.

The curriculum (for Modules I to V) which is currently being used by CETIS/CBTIS teachers for BTTP was authorized in 2011 by the Sector Coordination Unit on Academic Development (COSDAC) under the Secretary of Public Education (SEP), where key figures from the plastic industry were invited. Based on the curriculum, BTTP has been conducted at the three model CETIS/CBTIS since August 2011. However, the curriculum has not been reviewed since the authorization in 2011.

Output 5 (CNAD's and model CETIS/CBTIS's capacity for promoting linkage with the plastic industry is enhanced.)

Output 5 is judged to have been achieved, based on the achievement levels of the three OVIs.

By continuing public private partnership (PPP) activities, CNAD's and the model CETIS/CBTIS' capacity for promoting partnership with the plastic industry has been enhanced. Some of the companies having participated in the Pilot Project KAIZEN (PPK) are contributing to CVCC, offering their workplaces for the training of CETIS/CBTIS teachers, and/or starting receiving BTTP students for in-company training and employing them. At every model CETIS/CBTIS, PPP activities for facilitating students' in-company training and employment were made active through the introduction of the assessment of the plastic industry's needs for human resource development and exploratory visits to candidate companies that would offer in-company training.

(2) Prospect for the Achievement of the Project Purpose (The capacity to train the instructors of the plastic injection molding technology in CETIS/CBTIS is improved at CNAD.)

It has been judged that the Project Purpose will be achieved by the end of the Project period by: the

⁴ The themes of the modules are the following: Module I "Prepare materials for molding", Module II "Mold plastic by the extrusion process", Module III "Mold plastic by the injection process", Module IV "Mold plastic by the thermoset process" and Module V "Prepare mold and dice for plastic transformation process".

achieved Outputs (1 to 5) and the achievement levels of the three OVIs for the Project Purpose.

CNAD instructors have acquired sufficient knowledge and skills on plastic transformation technology to conduct training of CETIS/CBTIS teachers following the curriculum approved in the Project. As a result, it has been judged that those teachers for BTTP who took the training at CNAD have reached the required level although it is necessary to confirm the results of the final evaluation of all the participants.

3-2. Summary of Evaluation Results

The Project is evaluated based on the Five Criteria according to the following five levels: high, relatively high, medium, relatively low and low.

(1) Relevance: High

The Relevance of the Project is assessed as High.

The Project is consistent with the Mexico's National Development Plan 2013-2018, the Japan's ODA policies and the plastic industry's needs. It has been verified that the project approach is appropriate in achieving the Project Purpose as well.

(2) Effectiveness: Medium

The Effectiveness of the Project is assessed as High.

It has been judged that the Project Purpose will be achieved by the end of the Project period by: the achieved Outputs (1 to 5) and the achievement levels of the three OVIs for the Project Purpose. The Evaluation Team is of the opinion that the adequate methodology of the transfer of technology (from Expert to CNAD instructors) contributed to the achievement.

(3) Efficiency: Relatively High

The Efficiency of the Project is assessed as Relatively High.

While most of the Project inputs have been implemented as scheduled to produce intended Outputs, there have been several factors that have decreased the efficiency of the project implementation. However, those negative factors did not directly affect the achievement of the Outputs.

(4) Impact: High

The impact of the Project is assessed as High.

The prospect of the Overall Goal being achieved within three to five years after completion of the Project is high, provided that the following are undertaken: CETIS/CBTIS provide BTTP students with adequate opportunities of practical training; CNAD and CETIS/CBTIS continue PPP activities with an aim to promote in-company training and employment in plastic industry; and DGETI authorizes the opening of new BTTP or an increase in the number of classes under the current BTTP. For DGETI's considerable efforts, there has been an increase in the number of newly opened BTTP and that of classes under the current BTTP.

Driven by the education reform that aims at improving the coverage of education and the teachers' quality, CNAD's functions will be further extended.

(5) Sustainability: Relatively High

The Sustainability of the Project is assessed as Relatively High.

The mechanism to train CETIS/CBTIS teachers for BTTP has been established. It consists of: (a) the mechanism for the reviewing and approving of the curriculum for training CETIS/CBTIS teachers; (b) the Implementation Plan for the training of CETIS/CBTIS teachers for BTTP; (c) the list of the educational materials prepared in the Project (for CNAD instructors' use); and (d) the mechanism for the evaluation of the training of CETIS/CBTIS teachers for BTTP.

The mechanism to assess the plastic industry's needs has been established respectively at CNAD and

each model CETIS/CBTIS. There is a need to enhance the mechanism to share the information of the needs identified at each CETIS/CBTIS with CNAD.

It has been identified that CNAD needs a systemic structure to intensify its PPP activities, i.e. to further increase partner companies in plastic industry located in the regions that would be interested in employing qualified technicians and share such companies' information with CETIS/CBTIS.

3-3. Factors Promoting the Production of Effects

(1) Factors Concerning the Planning

The Project has been implemented benefiting from CNAD's experiences in human resource development in mechatronics supported by a JICA project (1995-1999) and other JICA experts.

(2) Factors Concerning the Implementation Process

The training of CNAD instructors provided by Experts was conducted in such a way that the goals to be achieved were firstly set at each stage of the training and then Experts checked the instructors' learning level in each stage and adjusted the contents of teaching. The (theoretical and practical) training consisted of the lectures given by Experts and the review sessions in which the instructors in charge (of the module) gave lectures on what they had been taught by Experts. This process provided confidence to the instructors in giving lectures.

3-4. Factors Inhibiting Project Progress

(1) Factors Related to Planning

Nothing in particular.

(2) Factors Concerning the Implementation Process

Nothing in particular.

3-5. Conclusions

As the Project Purpose is envisaged to be achieved by the end of the Project period, it is recommended that the Project be terminated in October 2014 as scheduled.

The Project has high Relevance, assessed from its consistency with the Mexico's development policies which give importance to the educational policies and Japan's ODA policies as well as the plastic industry's needs. Effectiveness of the Project is evaluated as high since all Outputs have been achieved and three OVI's for the Project Purpose have been achieved or expected to be achieved by the end of the Project period. The Efficiency of the Project is evaluated as relatively high; most of Project inputs have been realized as scheduled to produce intended Outputs, although there have been a few factors that decreased efficiency in the implementation of the Project. The impact of the Project is assessed as high since the Project will contribute to the production of qualified technicians to the plastic industry. The sustainability of the Project is judged as relatively high. There is a need for preparing a plan of how to increase the number of classes of existing and newly opening BTTP at CETIS/CBTIS, and a need for further enhancement of CVSP's functions at CNAD and the model CETIS/CBTIS.

3-6. Recommendations

To DGETI:

- (1)** Complete the equipment procurement (mold and peripheral equipment for the model CETIS/CBTIS) as soon as possible so that all model CETIS/CBTIS will be able to start conducting practical training in BTTP.
- (2)** Develop a plan of how to increase classes of existing and newly opening BTTP.
- (3)** Encourage COSDAC to periodically review and approve the curriculum of BTTP for CETIS/CBTIS teachers' use so that the plastic industry's needs are reflected to the curriculum in a timely manner.

To CNAD:

- (1) Establish a mechanism of further enhancing PPP activities in order to efficiently reflect the plastic industry's needs, which have been identified through CVSPP at CNAD as well as CETIS/CBTIS, to CNAD's training of CETIS/CBTIS teachers for BTTP.
- (2) In case of an increase in classes of existing and newly opening BTTP, develop a plan for training CETIS/CBTIS teachers for BTTP, by making use of the Implementation Plan prepared in the Project.
- (3) Enhance the human resource development for the industrial sector.

To DGETI/CNAD:

- (1) Continuously review the curriculum for the training of CETIS/CBTIS teachers for BTTP to respond to fast-changing industry's needs. Furthermore, establish a mechanism of assessing the plastic industry's needs in a holistic manner by making use of CVCC.
- (2) Develop criteria (educational background or basic knowledge) for selecting CETIS/CBTIS teachers to take the training for each module of BTTP; and present the proposal for the criteria to a relevant authority.

3-7. Lessons Learned

- (1) The head of every organization's (DGETI, CNAD and model CETIS/CBTIS) considerable commitment to the Project enabled the cascaded framework effectively work.
- (2) Establishing a strong linkage between key players has increased the effectiveness of the Project. A set of activities such as CVCC, company visits, PPK/PK and seminars which made a substantial effect, enabled CNAD and the model CETIS/CBTIS to further cooperation with the private sector.
- (3) It is crucial for the enhancement of PPP to introduce activities that would attract the private sector's interest. Through the implementation of PPK which successfully made the private sector realize the benefit of PPP (partnership between the private and education sectors), the private sector came to be truly committed to the collaboration with the model CETIS/CBTIS.
- (4) It is of great importance to produce human resources with sufficient theoretical knowledge and practical skills. The graduates of the model CETIS/CBTIS are highly appreciated for their theoretical knowledge by the companies that employed them, and are expected to be trained as supervisors. On the other hand, many of these companies are of the opinion that the graduates have not acquired sufficient practical skills. It is necessary to provide adequate opportunities of practical training.
- (5) DGETI will open new BTTP at a CBTIS running the mechatronics course. It is efficient to start activities with the CETIS/CBTIS that have the courses associated with industrial manufacturing (such as mechatronics and industrial chemistry) when newly opening BTTP, since the human resources (teachers) and the equipment of these courses can be utilized for BTTP.