Ministry of National Education (MoNE)
The Republic of Turkey

The Project on Strengthening the Program of Expanding Industrial Automation Technologies Department (SPREAD) in the Republic of Turkey

Final Report

September 2010

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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List of Abbreviations

C/P	Counterpart
GDTVE	General Directorate of Technical and Vocational Education
IAT	Industrial Automation Technologies
INCT	Institute of National Colleges of Technology, Japan
Izmir TML	Izmir Mazhar Zorlu Technical and Industrial Vocational High School
JICA	Japan International Cooperation Agency
JCC	Joint Coordinating Committee
JPT	JICA Project Team
MEXT	Japanese Ministry of Education, Culture, Sports, Science and Technology
MoNE	Ministry of National Education
PDM	Project Design Matrix
PPM	Project Progress Meeting
SPO	State Planning Organization
TTC	Teacher Training Center
VET	Vocational Education and Training

EXECUTIVE SUMMARY

Background of the Project Initiation

In response to lack of skilled middle-level technicians in the Turkish industry, "The Project on Establishment of Industrial Automation Technologies Departments in Anatolian Technical High Schools" was implemented between 2001 and 2006, and Industrial Automation Technologies (IAT) departments were established at Anatolian Technical High Schools in Izmir and in Konya.

With the successful implementation of this previous project, the Turkish Ministry of National Education (MoNE) decided to establish a Teacher Training Center (TTC) in Izmir and IAT departments at other schools. Although teacher training courses were initiated at the TTC, several concerns arose such as the preparation of teacher training textbooks, management of the courses, and evaluation of teacher training.

Under these circumstances, "The Project on Strengthening the Program of Expanding Industrial Automation Technologies Department" (hereinafter referred to as "the Project") was initiated in August 2007 by the Government of the Republic of Turkey in cooperation with the Japan International Cooperation Agency (JICA).

Outline of the Project

Under this cooperation arrangement between the Turkish Government and JICA, the MoNE and TTC, an affiliated institution of Izmir Mazhar Zorlu Technical and Industrial Vocational High School (Izmir TML), implemented various project activities in partnership with the JICA Project Team (JPT) which consisted of experts from PADECO Co., Ltd. and the Institute of National Colleges of Technology, Japan (INCT) commissioned by JICA.

The Project aimed to assist in strengthening the teacher training system at the TTC. In order to disseminate Vocational Education and Training (VET) for IAT in Turkey and respond to the demand for human resources from the Turkish industrial circles, the TTC developed a reliable system for providing fruitful teacher training, actually implemented the teacher training courses targeting teachers of the IAT departments at expansion schools[1], and formulated a long-term organizational strategy.

Advantages and Impacts of the Project

The creditable impacts and actual outcomes generated from the Project which were also acknowledged by the various stakeholders are as follows:

- **Developed the 25 teacher training textbooks.**
  Developed the 25 teacher training textbooks for use in the teacher training courses, based on the module textbooks for students, teacher training curriculum, and teacher training syllabi. The total number of pages of the 25 textbooks exceeds 3,500 pages, and these textbooks are also used in training for industry circles and other organizations.
- **Conducted teacher training courses for more than 1,100 teachers in total.**
  More than 1,100 teachers attended in the teacher training courses in total. Quality of the lectures, teaching materials, and experimental equipment were significantly improved during the Project and the TTC's teacher training was highly evaluated by the actual participants, administrative staff of the expansion schools, and other relevant entities from the Turkish educational community.

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[1] 20 expansion schools throughout Turkey were identified as targeted schools of dissemination of VET for IAT and teachers from the expansion schools received teacher training at the TTC.

- **Established and strengthened the TTC teacher training system.**
  Established the TTC's teacher training as the first and unique system in Turkey and strengthened the teacher training system through a series of activities such as planning, implementing, monitoring, and evaluating the teacher training courses. The teacher training manual was also developed, describing the organizational structure and roles of the TTC, framework and management of the teacher training courses, and so on.
- **Provided various training programs for industry circles and other organizations.**
  Provided various training programs for industry circles and other organizations such as the chamber of industry, private companies, and teachers from Azerbaijan, utilizing existing laboratory equipment and training materials including the teacher training textbooks.
- **Formulated the Long-term Strategy of the Teacher Training Center.**
  Formulated the Long-term Strategy of the Teacher Training Center that was approved by both the Turkish and Japanese sides. The strategy specifies envisioned missions, policies, objectives, and activities of the TTC as well as expected future activities, based on the discussion results from the task force meetings, current situation surrounding the TTC, and so on.
- **Strengthened cooperation activities with private enterprise and other countries.**
  Strengthened partnership with private enterprises and other countries, and subsequently started concrete cooperative activities with major private enterprises such as SMC Corporation, OMRON Electronics Ltd., and SIEMENS Turkey. The TTC has also started discussions with the MoNE and JICA to provide training for teachers from neighboring countries and initiate collaborative activities with a teacher training center in Mexico and so on for the future.

Major Factors of the Project's Success

By reviewing the three years of project activities, the following noteworthy evidence was found as the major factors of the project's success. These factors also serve as part of lessons learned from the Project for conducting other projects as well as for TTC's future activities.

- **Alignment with the Turkish national policies and needs of the industry circles.**
  The Project was consistent with the Turkish national policies and strategies, and there were also high expectations for skilled human resources from the Turkish industrial circles. Therefore the Project could gain the cooperation of the various relevant organizations, which led to effective implementation of the Project.
- **Long-term cooperation between Turkey and Japan and deep understanding of the Project.**
  The good relationship among the MoNE, JICA, TTC, and JPT was one major factor in the efficient implementation of the Project, which was based on Turkish side's deep understanding of the Project through long-term cooperation between Turkey and Japan in this field. In this regard, various training programs held in Japan were also effective.
- **Assigning the requisite number of lecturers and providing competent human resources.**
  As securing and providing necessary human resources is crucial for effective project implementation, the Project to some extent achieved in acquiring the required number of lecturers and competent human resources. The TTC lecturers actually received high evaluation for their performance.
- **Significant financial contribution of the MoNE.**
  Another key factor was significant financial contribution from the MoNE. Using that financial support, the TTC could procure various machines and tools for the teacher training courses. The MoNE also supported each expansion school in procuring experimental equipment and organizing meetings and workshops such as the Joint

Coordinating Committee (JCC) meeting and Project Progress Meeting (PPM), which was essential in achieving the actual outcomes of the Project.

- **Presence of leadership and ownership from the Turkish side.**
  Securing sufficient human and financial resources and accelerating leadership are indispensable for the effective implementing of project activities and generating actual outcomes. The Project was able to receive leadership and ownership from the Turkish side, in particular the MoNE, Izmir TML, and TTC, which accelerated and efficiently managed the project activities though a project manager had to be replaced two months before the completion of the Project.

- **Flexible responsiveness and project management of the JICA Project Team.**
  The JPT could flexibly provide technical and practical assistance to the TTC lecturers, depending on the prevailing circumstances such as the progress of each activity. The JPT could also contribute to efficient project management by establishing a close relationship with the lecturers and other relevant parties of the Project.

- **Early discussion about the sustainability after the Project.**
  The Project could establish the task force and start discussions at early stage about organizational position and functions of the TTC, future activities to be conducted after the Project, and so on. These discussions actually deepened relevant parties' understanding of the sustainability and contributed to the commitment to effectively performing each activity in the last phase of the Project.

The teacher training courses and other activities of the TTC are expected to continue and expand even after the Project. Surrounding environments are, however, constantly changing and flexible responses and necessary modifications to the system might be required, considering the factors outlined above and changing in the actual situation around the TTC.

Chapter 1   Overview of the Project

1.1   Background of the Project Initiation

In response to lack of skilled middle-level technicians in the Turkish industry, "The Project on Establishment of Industrial Automation Technologies Departments in Anatolian Technical High Schools" was implemented between 2001 and 2006, and Industrial Automation Technologies (IAT) departments were established at Anatolian Technical High Schools in Izmir and in Konya.

With the successful implementation of this previous project, the Turkish Ministry of National Education (MoNE) decided to establish a Teacher Training Center (TTC) in Izmir and IAT departments at other schools. Although teacher training courses were initiated at the TTC, several concerns arose such as the preparation of teacher training textbooks, management of the courses, and evaluation of teacher training.

Under these circumstances, "The Project on Strengthening the Program of Expanding Industrial Automation Technologies Department" (hereinafter referred to as "the Project") was initiated in August 2007 by the Government of the Republic of Turkey in cooperation with the Japan International Cooperation Agency (JICA).

1.2   Outline of the Project

Under this cooperation arrangement between the Turkish Government and JICA, the MoNE and TTC, an affiliated institution of Izmir Mazhar Zorlu Technical and Industrial Vocational High School (Izmir TML), implemented various project activities in partnership with the JICA Project Team (JPT) which consisted of experts from PADECO Co., Ltd. and the Institute of National Colleges of Technology, Japan (INCT) commissioned by JICA.

The Project aimed to assist in strengthening the teacher training system at the TTC. In order to disseminate Vocational Education and Training (VET) for IAT in Turkey and respond to the demand for human resources from the Turkish industrial circles, the TTC developed a reliable system for providing fruitful teacher training, actually implemented the teacher training courses targeting teachers of the IAT departments at expansion schools[1], and formulated a long-term organizational strategy.

In the final phase of the Project, the TTC performed various activities to complete teacher training textbooks, further enhance the teacher training system, and formulate the Long-term Strategy of the Teacher Training Center through a range of discussions on the organizational position and role of the TTC, considering future activities to be performed after the Project.

1.3   Project Purpose

The objective of the Project was to establish the reliable teacher training system at the TTC as mentioned above. Table 1.1 shows the Overall Goal, Purpose, and Outputs of the Project, which are shown in a Project Design Matrix (PDM) in Appendix A. The Overall Goal is expected to be achieved within about three years after project completion, while the Purpose is to be realized within the duration of the Project. The target area of the Project was the whole of Turkey.

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[1] 20 expansion schools throughout Turkey were identified as targeted schools of dissemination of VET
    for IAT and teachers from the expansion schools received teacher training at the TTC.

Table 1.1 Overall Goal, Purpose, and Outputs of the Project

Overall Goal
Vocational Education and Training (VET) for Industrial Automation Technologies (IAT) at the expansion schools is effectively practiced.
Purpose
Teacher training system of the Teacher Training Center (TTC) is established.
Outputs
Output 1: TTC's planning capacity of the teacher training program is strengthened.
Output 2: TTC's implementation capacity of the teacher training courses is strengthened.
Output 3: TTC's evaluation capacity for teacher training is strengthened.
Output 4: TTC's planning capacity of the long-term organizational strategy is strengthened.

Source: Project Design Matrix (PDM) of the Project

1.4 Implementation Structure and Project Schedule

1.4.1 Implementation Structure

A relevant institution was the General Directorate of Technical and Vocational Education (GDTVE) of the MoNE. The counterpart agency was the TTC of Izmir TML, which conducted project activities in cooperation with various organizations and entities both from the public and private sectors as well as with JICA and JPT.

1.4.2 Project Schedule

The duration of the Project was about 37 months and was divided into three phases. The main objectives and activities of each phase are described below:

First Phase (August 2007 – March 2008)
Prepared an activity plan for the Project and simultaneously created a structure to initiate the Project. Reviewed the Turkish educational system and training program, and subsequently conducted a baseline survey to create a framework for teacher training, including setting training objectives and specifying the teacher training courses.

Second Phase (April 2008 – March 2009)
Planned, implemented, monitored, and evaluated the teacher training courses according to the framework created in the first phase. Discussions with relevant organizations and parties were also initiated on the future organizational positioning and roles of the TTC.

Third Phase (April 2009 – September 2010)
Completed the teacher training textbooks for the teacher training courses and continued a series of activities such as planning, implementing, monitoring, and evaluating the courses and standardizing the TTC's teacher training system. Considering the Project was nearing completion, efforts were taken to further strengthen the teacher training system and formulate the Long-term Strategy of the Teacher Training Center.

Chapter 2   Project Tasks and Actual Activities

2.1   List of the Project Tasks

Project tasks in each phase and corresponding numbers of the outputs described in Table 1.1 are shown in Table 2.1.

Table 2.1 List of Project Tasks

Project Tasks		Outputs
Task 1: First Phase (August 2007 – March 2008)		
Task 1-1	Analyze the Turkish educational system and modules of the IAT departments	1 – 4
Task 1-2	Analyze the teachers' personnel system and training programs in Turkey	1 – 4
Task 1-3	Develop the Inception Report	1 – 4
Task 1-4	Conduct the baseline survey	1 – 4
Task 1-5	Set the purpose of TTC's teacher training	1
Task 1-6	Specify the teacher training courses	1
Task 1-7	Review operational plans of the TTC	1
Task 1-8	Select lecturers for the teacher training courses of the TTC	1
Task 1-9	Examine the curriculum of the teacher training courses	1
Task 1-10	Review the framework for the teacher training	1
Task 1-11	Develop and revise the module textbooks	1
Task 1-12	Monitor advanced training courses for teachers of mechanics and electronics	2
Task 1-13	Monitor the teacher training courses for 10th and 11th grades	2
Task 1-14	Evaluate the teacher training courses	3
Task 1-15	Evaluate the operational plans of the TTC	3
Task 1-16	Convene the Project Progress Meeting (PPM) and Joint Coordinating Committee (JCC)	1 – 4
Task 1-17	Develop the Progress Report and Completion Report	1 – 4
Task 2: Second Phase (April 2008 – March 2009)		
Task 2-1	Prepare an annual operational plan of the TTC	1
Task 2-2	Develop and revise the module textbooks	1
Task 2-3	Develop the teacher training textbooks for 10th grade	2
Task 2-4	Develop the teacher training textbooks for 11th grade	2
Task 2-5	Develop the teacher training textbooks for 12th grade	2
Task 2-6	Develop the teacher training textbooks for summer seminars	2
Task 2-7	Monitor the teacher training courses	2
Task 2-8	Plan management workshops for administrative staff of the expansion schools	2
Task 2-9	Hold management workshops for administrative staff	2
Task 2-10	Specify evaluation methods and criteria for the teacher training courses	3
Task 2-11	Evaluate the teacher training courses	3
Task 2-12	Monitor management and classes of the IAT departments at the expansion schools	3
Task 2-13	Evaluate the annual operational plan of the TTC	3
Task 2-14	Examine the Long-term Strategy of the Teacher Training Center	4
Task 2-15	Convene the Project Progress Meeting (PPM) and Joint Coordinating Committee (JCC)	1 – 4
Task 2-16	Develop the Progress Reports and Completion Report	1 – 4
Task 3: Third Phase (April 2009 – September 2010)		
Task 3-1	Prepare the annual operational plan of the TTC	1
Task 3-2	Develop and revise the module textbooks	1
Task 3-3	Review the teacher training curriculum	1
Task 3-4	Develop the teacher training textbooks for 11th grade	2
Task 3-5	Develop the teacher training textbooks for 12th grade	2
Task 3-6	Review the teacher training textbooks for 10th grade	2

Project Tasks		Outputs
Task 3-7	Review teacher training syllabi	2
Task 3-8	Monitor the teacher training courses	2
Task 3-9	Hold management workshops for administrative staff of the expansion schools	2
Task 3-10	Standardize teacher training management methodologies	2
Task 3-11	Evaluate the teacher training courses	3
Task 3-12	Monitor management and classes of the IAT departments in the expansion schools	3
Task 3-13	Review the evaluation methods and criteria for the teacher training courses	3
Task 3-14	Evaluate the annual operational plan of the TTC	3
Task 3-15	Discuss the organizational position and functions of the TTC	4
Task 3-16	Formulate the Long-term Strategy of the Teacher Training Center	4
Task 3-17	Convene the Project Progress Meeting (PPM) and Joint Coordinating Committee (JCC)	1 – 4
Task 3-18	Develop the Progress Reports, Final Report, and Completion Report	1 – 4

Source: Teacher Training Center and JICA Project Team

2.2 Work Plan

The work plan of the Project is shown in Figure 2.1.

Tasks	Phases/Tasks 1st	2nd	3rd
Preparatory tasks			
Analyze the Turkish educational system and modules of the IAT departments	1-1		
Analyze the teachers' personnel system and training programs in Turkey	1-2		
Develop the Inception Report	1-3		
Conduct the baseline survey	1-4		
Tasks for the Output 1: TTC's planning capacity			
Set the purpose of TTC's teacher training	1-5		
Specify the teacher training courses	1-6		
Review and develop operational plans of TTC	1-7	2-1	3-1
Select lecturers of the teacher training courses of the TTC	1-8		
Examine the curriculum of the teacher training courses	1-9		3-3
Review a framework for the teacher training	1-10		
Develop and revise the module textbooks	1-11	2-2	3-2
Tasks for the Output 2: TTC's implementation capacity			
Develop the teacher training textbooks for 10th grade		2-3	3-6
Develop the teacher training textbooks for 11th grade		2-4	3-4
Develop the teacher training textbooks for 12th grade		2-5	3-5
Develop the teacher training textbooks for summer seminars		2-6	
Review tacher training syllabi			3-7
Monitor advanced training courses for teachers of mechanics and electronics	1-12		
Monitor the teacher training courses	1-13	2-7	3-8
Plan management workshops for administrative staff of the expansion schools		2-8	
Hold management workshops for administrative staff		2-9	3-9
Standardize teacher training management methodologies			3-10
Tasks for the Output 3: TTC's evaluation capacity			
Specify evaluation methods and criteria for the teacher training courses		2-10	3-13
Evaluate the teacher training courses	1-14	2-11	3-11
Monitor management and classes of the IAT departments at the expansion schools		2-12	3-12
Evaluate the operational plans of the TTC	1-15	2-13	3-14
Tasks for the Output 4: TTC's long-term organizational strategy			
Discuss the organizational position and functions of the TTC			3-15
Examine and formulate a Long-term Strategy of the Teacher Training Center		2-14	3-16
Other Tasks			
Convene PPM and JCC	1-16	2-15	3-17
Develop the Progress Report and Completion Report	1-17	2-16	3-18
Inception Report: IC/R			
Progres Report: PR/R			
Completin Report: C/R			
Final Report: F/R			
Management Workshop: WS			
Project Progress Meeting: PPM			
Joint Coordinating Committee: JCC			

Source: Teacher Training Center and JICA Project Team

Figure 2.1 Work Plan

2.3   Project Tasks and Actual Activities

This section briefly presents the project tasks and activities that were actually performed during the Project, and Chapter 3 has a more detailed description of all the activities.

Task 1: First Phase (August 2007 – March 2008)
The TTC and JPT conducted activities of Task 1 in the first phase (August 2007 – March 2008). The first phase was an initiation stage and considered as a preparatory period to actually start various full-scale activities. The tasks in the first phase were basically performed as planned, though some tasks were modified or newly added based on results from a baseline survey and discussions among relevant parties.

Table 2.2 shows each task and the actual activities performed during the first phase.

Table 2.2 Tasks and Actual Activities in the First Phase

Tasks	Actual Activities
Task 1-1 Analyze the Turkish educational system and modules of the IAT departments	Reviewed existing materials and analyzed the Turkish educational system and modules of the IAT departments.
Task 1-2 Analyze the teachers' personnel system and training programs in Turkey	Analyzed the teachers' personnel system and training programs in Turkey, based on reports and materials produced by the MoNE and JICA.
Task 1-3 Develop the Inception Report	Drafted the Inception Report, summarizing objectives, tasks, implementation policy, project organization, and the work plan of the Project. The Inception Report was revised in November 2007 based on results from other tasks.
Task 1-4 Conduct the baseline survey	Conducted the baseline survey to comprehend the situation of the TTC and its teacher training system, and subsequently submitted the Baseline Survey Report in November 2007.
Task 1-5 Set the purpose of TTC's teacher training	Set the purpose of TTC's teacher training through comprehending the needs of industrial circles and reorganizing the curriculum of the IAT departments and subjects of teacher training. The specified purpose was to train teachers of the IAT departments at the expansion schools by providing necessary technical and theoretical knowledge to educate students in the departments.
Task 1-6 Specify the teacher training courses	Specified teacher training courses according to the results from the baseline survey and purpose of TTC's teacher training. The teacher training courses were composed of: 1) courses for 10th and 11th grades; 2) courses for 12th grade; and 3) special subject courses by summer seminars.
Task 1-7 Review operational plans of the TTC	Reviewed schedules of the TTC and developed annual and three-year operational plans, incorporating the courses specified by Task 1-6.
Task 1-8 Select lecturers for the teacher training courses of the TTC	26 teachers from the IAT departments at Izmir and Konya schools completed a five-day training program organized by the MoNE and all of them were certified as lecturers of the teacher training courses.
Task 1-9 Examine the curriculum of the teacher training courses	Drafted the curriculum for the teacher training courses, considering the purpose and existing issues of the teacher training.
Task 1-10 Review the framework for the teacher training	Reviewed the framework of the teacher training, including the purpose and curriculum. Also examined evaluation methods and improvement procedures.

Tasks	Actual Activities
Task 1-11 Develop and revise the module textbooks	Completed all the module textbooks for students of 10th and 11th grades. The JPT monitored progress in development/revision and gave technical advice and lectures.
Task 1-12 Monitor advanced training courses for teachers of mechanics and electronics	Prepared a form for summarizing monitoring results and subsequently monitored the advanced training courses for 42 teachers from the expansion schools by direct observation and interviews.
Task 1-13 Monitor the teacher training courses for 10th and 11th grades	Monitored the teacher training courses for 10th and 11th grades conducted in March 2008 and summarized the results using the form.
Task 1-14 Evaluate the teacher training courses	Evaluated the teacher training courses based on the monitoring results etc. and identified a few issues such as the necessity of clarifying training management system and implementation procedures.
Task 1-15 Evaluate the operational plans of the TTC	Reviewed the operational plans of the TTC to review schedules for the next year.
Task 1-16 Convene the Project Progress Meeting (PPM) and Joint Coordinating Committee (JCC)	Convened the Project Progress Meeting (PPM) on November 20, 2007 and Joint Coordinating Committee (JCC) on February 22, 2008 to review and discuss the project activities etc.
Task 1-17 Develop the Progress Report and Completion Report	Developed the 1st Progress Report and Completion Report of the first phase, reviewing the activities performed in the first phase.

Source: Teacher Training Center and JICA Project Team

Task 2: Second Phase (April 2008 – March 2009)

The TTC continued the project activities and performed Task 2 in the second phase (April 2008 – March 2009) in cooperation with the JPT. In this phase, various activities were undertaken such as developing the teacher training textbooks, planning and holding management workshops, enhancing monitoring and evaluation procedures, monitoring the expansion schools, and examining the Long-term Strategy of the Teacher Training Center.

Table 2.3 shows each task and the actual activities performed in the second phase.

Table 2.3 Tasks and Actual Activities in the Second Phase

Tasks	Actual Activities
Task 2-1 Prepare an annual operational plan of the TTC	Prepared an annual operational plan of the TTC, referring to the three-year operational plan developed in the first phase.
Task 2-2 Develop and revise the module textbooks	By the end of the second phase, completed 43 out of 50 module textbooks for students in 12th grade. The existing textbooks were also reviewed and revised with the technical assistance from the JPT.
Task 2-3 Develop the teacher training textbooks for 10th grade	Completed all the four teacher training textbooks for 10th grade with the technical assistance from the JPT prior to the teacher training for 10th and 11th grades that started in October 2008.
Task 2-4 Develop the teacher training textbooks for 11th grade	Completed five out of the eight teacher training textbooks for 11th grade by the end of the second phase, receiving advice and technical assistance from the JPT.
Task 2-5 Develop the teacher training textbooks for 12th grade	Started developing the teacher training textbooks for 12th grade.
Task 2-6 Develop the teacher training textbooks for summer seminars	Started developing the teacher training textbooks for summer seminars, receiving advice and technical assistance from the JPT.
Task 2-7 Monitor the teacher training courses	Monitored the teacher training courses for 10th and 11th grades, courses for 12th grade, and summer seminar, utilizing the monitoring sheets.

Tasks	Actual Activities
Task 2-8 Plan management workshops for administrative staff of the expansion schools	Planned management workshops for administrative staff of the expansion schools based on the results from the baseline survey and monitoring of the expansion schools.
Task 2-9 Hold management workshops for administrative staff	Held the management workshops for administrative staff on June 26 and 27, 2008 and exchanged opinions and ideas on management systems of the IAT departments in Turkey.
Task 2-10 Specify evaluation methods and criteria for the teacher training courses	Specified evaluation methods and criteria for the teacher training courses in May 2008 and modified those in September 2008 after actual application in the evaluation. The evaluation criteria consisted of five categories: i) planning and preparation of lectures; ii) lecture style; iii) teaching methods; iv) participants; and v) training environment and equipment.
Task 2-11 Evaluate the teacher training courses	Evaluated the teacher training courses, using the evaluation form, and analyzed the results from the evaluation. Shared the evaluation analysis results with the staff of the TTC and examined how to further improve the current level of the teacher training.
Task 2-12 Monitor management and classes of the IAT departments at the expansion schools	Conducted monitoring of 23 expansion schools in total and evaluated management and classes of the IAT departments.
Task 2-13 Evaluate the annual operational plan of the TTC	Compared the annual operational plan of the TTC and the actual activities to develop an annual operational plan for the next year.
Task 2-14 Examine the Long-term Strategy of the Teacher Training Center	Started examining future organizational roles of the TTC together with relevant organizations and entities such as the MoNE and JICA.
Task 2-15 Convene the Project Progress Meeting (PPM) and Joint Coordinating Committee (JCC)	Held the Project Progress Meeting (PPM) on June 26, 2008, October 20, 2008, and January 23, 2009. Also convened the Joint Coordinating Committee (JCC) on February 27, 2009 to review and discuss the project activities etc.
Task 2-16 Develop the Progress Reports and Completion Report	Developed the 2nd and 3rd Progress Reports and Completion Report of the second phase, reviewing the activities performed in the second phase.

Source: Teacher Training Center and JICA Project Team

Task 3: Third Phase (April 2009 – September 2010)

The TTC conducted Task 3 in the third phase (April 2009 – September 2010) with the assistance of the JPT. The third phase was the final phase of the Project and considered as the period to accomplish the Project and, at the same time, prepare for continuing the TTC's activities even after the end of the Project. The TTC and JPT continued activities to complete the teacher training textbooks, further enhance the training system of the TTC, delineate the Long-term Strategy of the Teacher Training Center, and advance various activities for attaining the Project Purpose.

Table 2.4 shows each task and the actual activities performed in the third phase.

Table 2.4 Tasks and Actual Activities in the Third Phase

Tasks	Actual Activities
Task 3-1 Prepare the annual operational plan of the TTC	Prepared the annual operational plan of the TTC in May and December 2009, referring to the three-year operational plan and evaluation results of the annual plans for the previous years.
Task 3-2 Develop and revise the module textbooks	Developed the remaining seven module textbooks for students in 12th grade anew by December 2009 and completed all the module textbooks including ones for 10th and 11th grades.

Tasks	Actual Activities
Task 3-3 Review the teacher training curriculum	Reviewed the teacher training courses and revised the teacher training curriculum in September 2009. Further revised the curriculum in July 2010, incorporating a new monitoring and evaluation system modified in March 2010.
Task 3-4 Develop the teacher training textbooks for 11th grade	Newly developed three teacher training textbooks for 11th grade by December 2009 and completed all the eight textbooks.
Task 3-5 Develop the teacher training textbooks for 12th grade	Completed all the 10 teacher training textbooks for 12th grade in June 2010.
Task 3-6 Review the teacher training textbooks for 10th grade	Reviewed the four textbooks for 10th grade that had been completed in the second phase.
Task 3-7 Review teacher training syllabi	Reviewed and revised all teacher training syllabi in July 2010 in accordance with the teacher training curriculum etc.
Task 3-8 Monitor the teacher training courses	Monitored the following teacher training courses: - Course for 12th grade, advanced level 1 (Mar.–May 2009); - Summer seminar (Jun.–Aug. 2009); - Course for 10th and 11th grades, basic level 1 (Sep.–Nov. 2009); - Course for 10th and 11th grades, basic level 2 (Nov.–Dec. 2009); - Course for 12th grade, advanced level 2 (Dec.2009); - Winter seminar (Mar. 2010); - Course for 12th grade, advanced level 1 (Mar.–Apr. 2010); - Course for 12th grade, advanced level 2 (Apr.–May 2010); and - Summer seminar (Jun.–Aug. 2010).
Task 3-9 Hold management workshops for administrative staff of the expansion schools	Held the management workshops for administrative staff from the expansion schools in June 2009, January 2010, and August 2010.
Task 3-10 Standardize teacher training management methodologies	Revised the teacher training manual in September 2009 and finalized it within the Project in July 2010, incorporating the new monitoring and evaluation system. The manual is expected to be modified according to the needs even after the Project.
Task 3-11 Evaluate the teacher training courses	Evaluated the teacher training courses mentioned in Task 3-8, based on the monitoring results, interviews, etc.
Task 3-12 Monitor management and classes of the IAT departments in the expansion schools	Monitored the management and classes of the IAT departments in five expansion schools.
Task 3-13 Review the evaluation methods and criteria for the teacher training courses	Reviewed the evaluation methods and criteria for the teacher training courses in March 2010, considering results and discussions from the Terminal Evaluation Study conducted between February and March 2010, and subsequently developed the new monitoring and evaluation system.
Task 3-14 Evaluate the annual operational plan of the TTC	Evaluated the previous annual operational plans of the TTC to develop a plan for 2010 and also timely updated the plan.
Task 3-15 Discuss the organizational position and functions of the TTC	Discussed the current and future organizational position and functions of the TTC through task force meetings.
Task 3-16 Formulate the Long-term Strategy of the Teacher Training Center	Drafted the Long-term Strategy of the Teacher Training Center in September 2009 and finalized it through discussions during the Terminal Evaluation Study.
Task 3-17 Convene the Project Progress Meeting (PPM) and Joint Coordinating Committee (JCC)	Held the PPM in June 2009, January 2010, and May 2010. Also convened the JCC in April and August 2010.
Task 3-18 Develop the Progress Reports, Final Report, and Completion Report	Developed the 4th, 5th, and 6th Progress Reports in August 2009, February 2010, and June 2010 respectively. Also produced the Final Report and Completion Report of the third phase in September 2010.

Source: Teacher Training Center and JICA Project Team

Chapter 3   Achievements of the Project Activities

3.1   List of the Project Activities and Corresponding Tasks

The TTC and JPT performed the project activities shown in Table 3.1 that lists categorized activities and those corresponding tasks stated in Chapter 2.

Table 3.1 List of the Project Activities and Corresponding Tasks

Project Activities	Corresponding Tasks
1. Framework for the teacher training system	
1-1 Conduct preliminary analysis and the baseline survey	1-1, 1-2, 1-4
1-2 Establish the framework for the teacher training system	1-5, 1-10, 3-10
1-3 Specify the teacher training courses and design the curriculum	1-6, 1-9, 1-11, 2-2, 3-2, 3-3
1-4 Review the operational plans of the TTC	1-7, 1-15, 2-1, 2-13, 3-1, 3-14
2. Implementation of the teacher training courses	
2-1 Select lecturers and make up the teacher training syllabi	1-8, 3-7
2-2 Develop the teacher training textbooks	2-3, 2-4, 2-5, 2-6, 3-4, 3-5, 3-6
2-3 Implement the teacher training courses	N/A
3. Monitoring and evaluation of the teacher training courses and IAT departments	
3-1 Monitor the teacher training courses	1-12, 1-13, 2-7, 3-8
3-2 Evaluate the teacher training courses	1-14, 2-10, 2-11, 3-11, 3-13
3-3 Monitor the IAT departments of the expansion schools	2-12, 3-12
4. Long-term Strategy of the Teacher Training Center	
4-1 Examine organizational position and functions of the TTC	2-14, 3-15
4-2 Formulate the Long-term Strategy of the Teacher Training Center	3-16
4-3 Strengthen partnership with other institutions and industrial circles	N/A
5. Other activities	
5-1 Workshops and meetings	1-16, 2-8, 2-9, 2-15, 3-9, 3-17
5-2 Reports	1-3, 1-17, 2-16, 3-18
5-3 Counterpart training in Japan	N/A
5-4 Terminal Evaluation Study	N/A

Source: Teacher Training Center and JICA Project Team

3.2   Framework for the Teacher Training System

3.2.1   Preliminary Analysis and Baseline Survey

The JPT analyzed the educational system, teacher's personnel system, and training programs in Turkey through a literature review of existing materials. The TTC and JPT also conducted the baseline survey during the first phase to comprehend the situations of the TTC and the teacher training system, and subsequently produced the Baseline Survey Report in November 2007. The report compiled information obtained through the survey and results from the analyses and discussions on various aspects such as policies of the MoNE, educational system in Turkey, module textbooks of the IAT departments, status of the TTC and expansion schools, and teacher training system. The baseline survey found a few points to be examined as follows:

- Quantitative indicators in the PDM should be modified;
- Existing meetings should be utilized as management workshops for administrative staff from the expansion schools; and
- Teacher training system should be reconstructed before developing the teacher training textbooks.

3.2.2 Framework for the Teacher Training System

The TTC and JPT set the purpose of the TTC's teacher training and reviewed its framework through comprehending needs of industrial circles, reorganizing the curriculum of the IAT departments and subjects of teacher training, and examining evaluation methods and improvement procedures. The specified purpose is: "training teachers of the IAT departments at the expansion schools by providing necessary technical and theoretical knowledge for educating students in the departments".

In the third phase, the teacher training manual was drafted anew in September 2009 and finalized in July 2010 as the final edition within the Project, incorporating the new monitoring and evaluation system for the teacher training courses. The teacher training manual is comprised of two parts: i) management of the Teacher Training Center; and ii) teacher training courses for the expansion schools. The first part describes the organizational structure and roles, financial and human resources, and equipment of the TTC. The latter part describes the framework and management of the teacher training courses, including implementation and evaluation procedures of the courses.

The TTC is expected to review and modify the manual if necessary even after the completion of the Project, in accordance with not only the actual activities but also the future surrounding environments such as positions and roles of the TTC and teacher training in Turkey.

3.2.3 Teacher Training Courses and Curriculum

The TTC specified the teacher training courses with the assistance of the JPT based on the baseline survey results and purpose of the TTC's teacher training. The teacher training courses are basically composed of the following three programs:

- Teacher training courses for 10th and 11th grades;
- Teacher training courses for 12th grade; and
- Special subject courses by summer seminars.

Although the teacher training courses for 10th and 11th grades and 12th grade target teachers from the IAT departments, teachers of other departments are also included in participants in the summer seminars. The summer seminars consist of various one-week training programs on special subjects and are conducted in cooperation with the plastic department of Izmir TML.

In the first phase, the TTC drafted the curriculum of the teacher training courses in cooperation with the JPT, considering the purpose and existing demand for teacher training. In the third phase, the teacher training curriculum was newly revised in September 2009 based on the evaluation results of the teacher training courses, which specified the purpose and framework of the teacher training courses and procedures for modifying the curriculum and syllabi. Although the TTC and JPT further modified the teacher training curriculum in July 2010 to reflect the existing situation, particularly the new monitoring and evaluation system, it is expected to be modified or customized according to the need even after the Project.

The TTC also worked on the module textbooks for students of the IAT departments and all of the 43 module textbooks for 10th and 11th grades were completed in the first phase. 50 module textbooks for 12th grade were also developed by December 2009 in the third phase and all the module textbooks for all the grades were completed through the Project.

3.2.4   Operational Plans of the TTC

The TTC and JPT reviewed TTC's schedules and developed annual and three-year operational plans in the first phase incorporating the teacher training courses. The basic annual schedule of the TTC is as follows:

- February – May: Teacher training courses for 12th grade;
- June – August: Special subject courses by summer seminars; and
- September – December: Teacher training courses for 10th and 11th grades.

The TTC continued to modify the operational plans in cooperation with the JPT by reviewing the evaluation results of the teacher training courses, situation and concerns, and future activities of the TTC. The operational plan of the TTC for 2010, developed in December 2009, was updated in May and August 2010 as shown in Appendix B, which also shows planned and actual schedules of the teacher training courses and other activities conducted over the past three years.

The planned teacher training courses were basically conducted according to the schedules and the TTC also provided several other training programs such as training courses for teachers from Azerbaijan, training programs for industrial circles, and a winter seminar. Targeted participants and aims of the winter seminar, organized in March 2010 for the first time, were similar to those of the summer seminar mentioned in 3.2.3. The TTC plans to continue these training programs besides the general teacher training courses.

3.3   Implementation of the Teacher Training Courses

3.3.1   Lecturers for the Courses and Teacher Training Syllabi

26 teachers from the IAT departments at Izmir and Konya schools completed a five-day training program organized by the MoNE in January 2008 and all of them were certified as the lecturers of the teacher training courses. The five-day training aimed to clarify necessary abilities of the lecturers for providing the teacher training and to enhance skills of potential lecturers. The JPT assisted in: i) preparing a training program; ii) implementing two subjects of the program; and iii) conducting a test and evaluating its results.

All of the syllabi of the teacher training courses were completed in the third phase. Each syllabus shows a title, hours, objective, and main point of the lecture as well as corresponding module textbooks and potential lecturers in charge. The teacher training syllabi are expected to be modified according to need in accordance with the teacher training curriculum.

3.3.2   Teacher Training Textbooks

The TTC lecturers vigorously worked on the teacher training textbooks for use in the TTC's teacher training, based on the teacher training curriculum and teacher training syllabi. All the teacher training textbooks whose titles are shown in Table 3.2 were completed in June 2010 and printed in August 2010 though the lecturers will update and modify these textbooks even after the Project depending on the situation. Covers of a few textbooks are shown in Figure 3.1.

The JPT provided technical assistance for the TTC lecturers to develop and modify the teacher training textbooks and Appendix C summarizes major technical advice and lectures provided during the Project. These assistance and lectures were utilized for not only developing and enhancing the teacher training textbooks but also modifying the module textbooks for students in the IAT departments and providing actual teacher training.

Table 3.2 List of the Teacher Training Textbooks

Categories	Titles
Textbooks for 10th grade (4 Textbooks)	- Programming I - Machine Tool - Analog Electronics - Digital Electronics
Textbooks for 11th grade (8 Textbooks)	- Programming II - Computer Network - Computer Aided Design (CAD) - Machine Design - Circuit Design - Sensor Technology - Programmable Logic Controller (PLC) - Actuator I
Textbooks for 12th grade (10 Textbooks)	- Automatic Production - Advanced Computer Control - Microcontroller I - Actuator II - Automatic Control - Internet Programming and Security - Supervisory Control and Data Acquisition (SCADA) System - Flexible Manufacturing System (FMS) - Industrial Robots - Industrial Communication System
Textbooks for Summer Seminar (3 Textbooks)	- Programming III - Microcontroller II - Company Automation

Source: Teacher Training Center and JICA Project Team

Source: Teacher Training Center and JICA Project Team

Figure 3.1 Covers of the Teacher Training Textbooks

3.3.3   Implementation of the Teacher Training Courses

Table 3.3 lists the actual teacher training courses provided during the Project and Figure 3.2 shows photographs taken during the lectures. The TTC implemented all kinds of program of the teacher training courses by December 2009 that were specified in the first phase.

More than 1,100 teachers participated in the courses in total and all of them completed the programs of each course and received certificates, except the teacher training course for 10th and 11th grades (basic level 2) conducted from November 24 to December 26, 2008. In this course, one participant could not complete the program due to personal reasons.

Table 3.3 Teacher Training Courses Provided During the Project

Teacher Training Courses	Timing
First Phase	
Advanced training for teachers of Mechanics and Electronics	November 2007
Teacher training course for 10th and 11th grades	March 3, 2008 – March 28, 2008
Second Phase	
Teacher training course for 10th and 11th grades, basic level 2	April 14, 2008 – May 9, 2008
Teacher training course for 12th grade, advanced level 1	May 25, 2008 – June 20, 2008
Summer seminar	June 30, 2008 – August 1, 2008
Teacher training course for 10th and 11th grades, basic level 1	October 6, 2008 – November 14, 2008
Teacher training course for 10th and 11th grades, basic level 2	November 24, 2008 – December 26, 2008
Third Phase	
Teacher training course for 12th grade, advanced level 1	March 23, 2009 – May 29, 2009
Summer seminar	June 15, 2009 – August 21, 2009
Teacher training course for 10th and 11th grades, basic level 1	September 28, 2009 – November 6, 2009
Teacher training course for 10th and 11th grades, basic level 2	November 16, 2009 – December 18
Teacher training course for 12th grade, advanced level 2	December 21, 2009 – December 25, 2009
Winter Seminar	March 1, 2010 – March 19, 2010
Teacher training course for 12th grade, advanced level 1	March 22, 2010 – April 9, 2010
Teacher training course for 12th grade, advanced level 2	April 26, 2010 – May 14, 2010
Summer seminar	June 14, 2010 – August 13, 2010

Source: Teacher Training Center and JICA Project Team

Source: Teacher Training Center and JICA Project Team

Figure 3.2 Lecture Photographs of the Teacher Training Courses

The teacher training courses will continue even after the Project. The TTC submitted a training plan for 2011 to the MoNE in September 2010 and the MoNE is going to sequentially determine the implementation of the courses and those schedules in cooperation with the TTC.

3.4 Monitoring and Evaluation of the Teacher Training Courses and IAT Departments

3.4.1 Monitoring of the Teacher Training Courses

The TTC and JPT monitored the teacher training courses by direct observation and conducted questionnaire surveys for the participants in the training courses at the last lecture of each subject. The TTC also conducted another type of questionnaire surveys for the participants and chiefs of the IAT departments six months after the courses. Appendix D shows the forms of the monitoring sheet and questionnaires and compiles results from the recent questionnaire surveys.

(1) Monitoring by Direct Observation

The TTC and JPT monitored the teacher training courses showed in Table 3.4 by direct observation and filled out 119 monitoring sheets in total. The monitoring sheet consists of the following five items and the monitoring results were used to evaluate the teacher training courses, which is further described in 3.4.2:

- Planning and preparation of lectures;
- Lecture style;
- Teaching methods;
- Participants; and
- Training environment and equipment.

Table 3.4 Teacher Training Courses Monitored During the Project

Teacher Training Courses	Timing	Numbers of Monitoring Sheets
First Phase		
Advanced training for teachers of Mechanics and Electronics	November 2007	8
Teacher training course for 10th and 11th grades	March 3, 2008 – March 28, 2008	2
Second Phase		
Teacher training course for 10th and 11th grades, basic level 2	April 14, 2008 – May 9, 2008	2

Teacher Training Courses	Timing	Numbers of Monitoring Sheets
Teacher training course for 12th grade, advanced level 1	May 25, 2008 – June 20, 2008	2
Summer seminar	June 30, 2008 – August 1, 2008	5
Teacher training course for 10th and 11th grades, basic level 1	October 6, 2008 – November 14, 2008	9
Teacher training course for 10th and 11th grades, basic level 2	November 24, 2008 – December 26, 2008	17
Third Phase		
Teacher training course for 12th grade, advanced level 1	March 23, 2009 – May 29, 2009	7
Summer seminar	June 15, 2009 – August 21, 2009	21
Teacher training course for 10th and 11th grades, basic level 1	September 28, 2009 – November 6, 2009	14
Teacher training course for 10th and 11th grades, basic level 2	November 16, 2009 – December 18, 2009	9
Teacher training course for 12th grade, advanced level 2	December 21, 2009 – December 25, 2009	5
Winter Seminar	March 1, 2010 – March 19, 2010	2
Teacher training course for 12th grade, advanced level 1	March 22, 2010 – April 9, 2010	8
Teacher training course for 12th grade, advanced level 2	April 26, 2010 – May 14, 2010	3
Summer seminar	June 14, 2010 – August 13, 2010	5
Total Number of Monitoring Sheets		**119**

Source: Teacher Training Center and JICA Project Team

(2) Questionnaire Surveys at the Last Lecture of Each Subject

The TTC conducted the questionnaire surveys for the participants in the teacher training courses at the last lecture of each subject. Questionnaire and survey methods were continuously reviewed and modified a few times during the Project and the most recent form was developed in March 2010.

Table 3.5 shows percentages of answers to questions of the surveys, using the previous form, in order to evaluate the following teacher training courses:

- Teacher training courses for 10th and 11th grades, basic level 1
  (September 28, 2009 – November 6, 2009);
- Teacher training courses for 10th and 11th grades, basic level 2
  (November 16, 2009 – December 18, 2009); and
- Teacher training courses for 12th grade, advanced level 2
  (December 21, 2009 – December 25, 2009).

According to these results from the questionnaire surveys, it can be observed that most of the participants in the teacher training courses were satisfied with the TTC's teacher training itself (Question 1), equipment and materials for the training (Question 2), teacher training textbooks (Question 7), and classroom (Question 9) as well as information provided by the lecturers (Question 6) and knowledge and teaching methods of the lecturers (Question 11 and 12).

However the results do not indicate the expected sufficiency or satisfaction for the amount of practice during the lectures (Question 4) and duration of the training course (Question 5) and the results for the two items had relative high percentages of answers with "No". Evaluation for these items depends largely on each participant's level of technical knowledge and skills, their alignment with the purpose for teacher training, and so on, and therefore mutual communication between the TTC and expansion schools and participants may have to be further strengthened.

Table 3.5 Questionnaire Survey Results (Sep. – Dec. 09)

Questions	Course for 10th and 11th grades, basic level 1 (Sep. 28 – Nov. 6, 2009)				Course for 10th and 11th grades, basic level 2 (Nov. 16 – Dec. 18, 2009)				Course for 12th grade, advanced level 2 (Dec. 21 – Dec. 25, 2009)			
	Percentages of Answers (%)				Percentages of Answers (%)				Percentages of Answers (%)			
	Yes	Neutral	No	*	Yes	Neutral	No	*	Yes	Neutral	No	*
1 The training at TTC was valuable for educating students.	80.4	14.3	5.4	112	80.6	2.9	16.5	103	75.0	12.5	12.5	16
2 Equipment and materials for the training were sufficient.	88.4	3.6	8.0	112	83.5	4.9	11.7	103	100.0	0.0	0.0	16
3 All the subjects were sufficiently taught.	76.8	14.3	8.9	112	62.1	7.8	30.1	103	62.5	6.3	31.3	16
4 Amount of practice during the lectures was enough.	58.0	26.8	15.2	112	56.3	9.7	34.0	103	56.3	25.0	18.8	16
5 Duration of the training course was enough.	47.3	22.3	30.4	112	34.0	31.1	35.0	103	25.0	43.8	31.3	16
6 Information on the equipment and materials were appropriately provided by the lecturers.	87.5	10.7	1.8	112	82.5	1.9	15.5	103	75.0	0.0	25.0	16
7 Teacher training textbooks were sufficient to understand the lectures.	87.5	9.8	2.7	112	90.3	1.9	7.8	103	81.3	0.0	18.8	16
8 Subjects were appropriate and fitted the times.	88.4	8.9	2.7	112	91.3	1.0	7.8	103	100.0	0.0	0.0	16
9 Classrooms are suitable for the lectures.	94.6	5.4	0.0	112	90.3	0.0	9.7	103	100.0	0.0	0.0	16
10 The number of the lecturers was enough.	74.1	4.5	21.4	112	77.7	10.7	11.7	103	100.0	0.0	0.0	16
11 Knowledge of the lecturers was sufficient.	98.2	1.8	0.0	112	93.2	0.0	6.8	103	81.3	0.0	18.8	16
12 Teaching methods and techniques of the lecturers were adequate.	96.4	2.7	0.9	112	90.3	1.9	7.8	103	87.5	0.0	12.5	16

* The numbers of valid responses, which do not correspond with the numbers of actual participants in the teacher training courses because the questionnaire surveys were conducted at the last lecture of each subject and same participants filled out the questionnaire more than once.
Source: Teacher Training Center and JICA Project Team

Table 3.6 shows questionnaire survey results for the following teacher training courses based on the modified form:

- Teacher training courses for 12th grade, advanced level 1
  (March 22, 2010 – April 9, 2010);
- Teacher training courses for 12th grade, advanced level 2
  (April 26, 2010 – May 14, 2010); and
- Summer seminar (June 14, 2010 – August 13, 2010).

Although evaluations of the course for 12th grade (advanced level 1) and the course for 12th grade (advanced level 2) were relatively low and answers of "Neutral" were large, more than 80% of the respondents positively answered to all the questions for the summer seminar. In particular, percentages of positive answers to most of the questions exceeded 90% and those to some questions were nearly at 100%. The survey results indicate low percentages of negative answers even for the courses for 12th grade (advanced level 1 and 2).

Evaluations of the textbooks and handouts in the courses for 12th grade (advanced level 1 and 2) were relative low, which may be because that the teacher training textbooks for 12th grade had not been completed during the courses. As more than 80% of the respondents were satisfied with the textbooks and handouts in the summer seminar, incomplete textbooks may be one of the major factors for the undesirable evaluation results for the courses for 12th grade (advanced level 1 and 2). In this regard, all the teacher training textbooks were completed by June 2010 as described in 3.3.2.

Regarding the evaluation results of the question D.1, "the number of lecturers was enough for the training", evaluations by the participants greatly differ among the courses of advanced level 1 and 2 and summer seminar, and the percentages of the positive answer for the three courses were 48.4%, 90.3%, and 98.6% respectively. Because the number of lecturers assigned to a class is defined by the MoNE based on the number of participants in each class, only one lecturer was assigned in the course of advance level 1, and meanwhile two lecturers could take charge of each class in the course of advanced level 2 and summer seminar.

If it can be said that the number of lecturers is one of major factors in the difference of the evaluations among the three courses and significantly affects achievements from the teacher training courses, it may be necessary to reexamine the assignment rule of the lecturers, considering a balance between efficient use of resources and effectiveness of the teacher training courses.

Table 3.6 Questionnaire Survey Results (Mar. – Aug. 10)

Questions	Course for 12th grade, advanced level 1 (Mar. 22 – Apr. 9, 2010) Percentages of Answers (%)				Course for 12th grade, advanced level 2 (Apr. 26 – May 14, 2010) Percentages of Answers (%)				Summer seminar (Jun. 14 – Aug. 13, 2010) Percentages of Answers (%)			
A. Planning and program.	**Good**	**Neutral**	**Not at all**	*	**Good**	**Neutral**	**Not at all**	*	**Good**	**Neutral**	**Not at all**	*
A.3 Consistency between the program and objective.	73.4	20.3	6.3	112	83.1	15.1	1.8	160	91.5	6.2	2.3	177
A.5 Textbooks and handouts.	55.4	26.0	18.7	112	60.1	29.3	10.7	160	82.5	12.4	5.1	177
B. Lecturers	**Sufficient**	**Neutral**	**Not at all**		**Sufficient**	**Neutral**	**Not at all**		**Sufficient**	**Neutral**	**Not at all**	
B.1 Knowledge and skill.	55.9	35.7	8.5	112	73.4	25.9	0.7	160	90.4	9.0	0.6	177
B.4 Clarity, understandability, and appropriateness level of the lectures.	61.4	26.1	12.4	112	73.6	23.0	3.4	160	82.2	14.9	2.9	174
B.5 Preparation prior to the lectures.	61.5	25.4	13.2	112	72.5	25.5	2.0	160	89.6	8.7	1.7	173
B.8 Conducting of the lectures according to the plan.	75.9	18.1	6.0	112	72.2	27.8	0.0	160	93.1	6.4	0.6	173
B.11 Teaching methods.	69.0	21.7	9.2	112	86.3	12.3	1.4	160	93.1	5.7	1.3	159
C. Achievements from the training	**Yes**	**Neutral**	**No**		**Yes**	**Neutral**	**No**		**Yes**	**Neutral**	**No**	
C.1 The training satisfied my expectation.	45.4	34.0	20.5	112	60.2	30.3	9.4	160	82.4	14.4	3.3	153
C.4 The training gave me necessary knowledge and skills on the subject.	68.4	16.9	14.7	112	80.6	19.4	0.0	160	94.7	2.6	2.6	152
C.10 The training was valuable for me to sufficiently educate students.	46.0	35.0	18.9	112	67.1	19.2	13.7	160	83.2	11.2	5.6	143
D. General Evaluation	**Yes**	**No**			**Yes**	**No**			**Yes**	**No**		
D.1 The number of lecturers was enough for the training.	48.4	51.6		112	90.3	9.7		160	98.6	1.4		143
D.2 Equipment, devices, and tools used in the training were enough.	67.7	32.3		112	78.3	21.7		160	95.1	4.9		143
D.6 The training was beneficial.	76.3	23.7		112	94.2	5.8		160	99.3	0.7		142
D.7 Do you want to join the next course?	77.7	22.3		112	89.3	10.7		160	99.3	0.7		141

* The numbers of valid responses, which do not correspond with the numbers of actual participants in the teacher training courses because the questionnaire surveys were conducted at the last lecture of each subject and same participants filled out the questionnaire more than once.
Source: Teacher Training Center and JICA Project Team

(3)   Questionnaire Surveys Six Months after the Training Courses

The TTC conducted another type of questionnaire surveys six months after the teacher training courses, targeting the chiefs of the IAT departments of each school as well as the participants in the training courses. Table 3.7 and Table 3.8 compile results from the questionnaire surveys recently conducted in February and June 2010.

Table 3.7 shows answers to a question for the participants in the teacher training courses: "Based on your experience in your classes for students, was the training course at TTC practically valuable for the classes?"

Table 3.7 Value of the Teacher Training Courses for Classes Targeting Students

Answers	The Numbers of Answers and Those Percentages			
	February 2010		June 2010	
Very valuable	2	(6.5%)	2	(15.4%)
Valuable	28	(90.3%)	11	(84.6%)
Not valuable	1	(3.2%)	0	(0.0%)
Total	31	(100.0%)	13	(100.0%)

Source: Teacher Training Center and JICA Project Team

Table 3.8 shows answers to a question for the chiefs of the IAT department of each school: "Do you think that teachers of your department enhanced their technical knowledge and skills for educating students through the teacher training at TTC?"

Table 3.8 Enhancement of Technical Knowledge and Skills through the Training

Answers	The Numbers of Answers and Those Percentages			
	February 2010		June 2010	
Enhanced very much	1	(7.1%)	1	(25.0%)
Enhanced	13	(92.9%)	3	(75.0%)
Not enhanced (No change)	0	(0.0%)	0	(0.0%)
Total	14	(100.0%)	4	(100.0%)

Source: Teacher Training Center and JICA Project Team

These results indicate favorable evaluation results for the teacher training course though the numbers of respondents may not be sufficient. In particular, it is remarkable that percentages of negative answers were extremely low and both the actual participants and chiefs of the IAT departments highly evaluated the TTC's teacher training. The survey results also indicate comparatively low answers of "very valuable" or "enhanced very much". In order to increase those answers, further enhancement may be required in both the teacher training system itself and general educational system of the IAT departments.

3.4.2   Evaluation of the Teacher Training Courses

(1)   Evaluation System of the Teacher Training Courses

The TTC and JPT specified evaluation methods and criteria of the teacher training courses and evaluated the provided courses, utilizing the evaluation form developed in May 2008 and modified in September 2008.

In March 2010, the TTC and JPT reviewed the previous monitoring and evaluation system of the teacher training courses, considering evaluation results and recommendations from the Terminal Evaluation Study, and subsequently the TTC developed the new monitoring and evaluation system through a series of discussions. Figure 3.3 shows an outline of the new monitoring and evaluation system that was applied from the teacher training courses for 12th

grade (advanced level 1) started in late March 2010. Forms for the evaluation activities are shown in Appendix E.

Activities of the New Monitoring and Evaluation System
1. Monitoring of the lectures using the monitoring sheet
2. Questionnaire survey at the last lecture of each subject/course
3. Self-evaluation by lecturers including their evaluation of participants (new activity)
4. Evaluation meeting after each course by all the lecturers of the TTC (new activity)
5. Questionnaire survey six months after each course
6. Final evaluation of the course using the evaluation sheet (new procedure)
7. Review of the course curriculum and lecture program (new procedure)
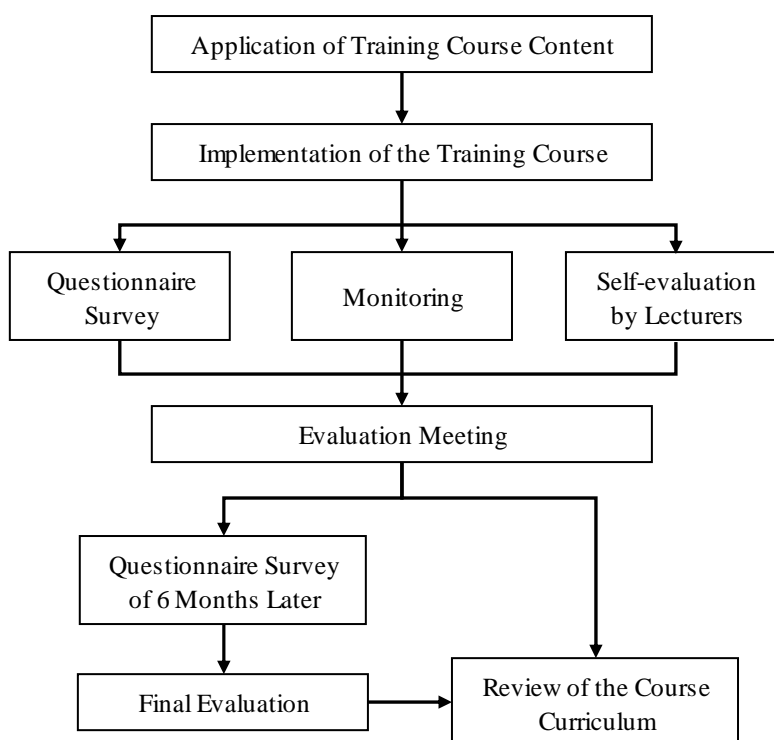
Source: Teacher Training Center and JICA Project Team

Figure 3.3 New Monitoring and Evaluation System

The TTC and JPT continuously discussed for further enhancement of the monitoring and evaluation system to resolve the issues mentioned in 3.4.1, improve the current situation as much as possible, and maintain the existing advantages of the teacher training system. Table 3.9 shows main items that the TTC and JPT have recently studied and started for the future training courses to be provided after the Project.

Table 3.9 Main Items for the Future Training Courses

Categories	Contents
Monitoring by direct observation	- Flexibly adjust frequency and length of direct observation depending on the situation. - Adequately assign persons who observe lectures considering restricted human resources of the TTC, degree of burden, and so on.
Questionnaire surveys	- Utilize an automatic aggregate calculation system to analyze survey results. - Conduct a survey at the last lecture of each course along with an examination. - Regularly review the questionnaire forms, methods of calculation and analysis, and spreadsheets, considering purposes of conducting questionnaire surveys.
Management of the system	- Effectively manage the monitoring and evaluation activities and other activities, considering human resource management and time management. - Keep on reconfirming the importance of monitoring and evaluation activities among the TTC lecturers.

Source: Teacher Training Center and JICA Project Team

(2)   Evaluation Results and Future Activities

Through a series of discussions during the evaluation activities, the TTC and JPT reconfirmed the importance of improving participants' understanding of the teacher training courses, which was also mentioned by the Terminal Evaluation Study as mentioned in 3.6.4. The TTC lecturers are trying specifically explaining the objectives etc. of the whole course and each subject at the beginning of each course and class.

It is also essential that participants clarify objectives of their participation in the teacher training courses before coming to the TTC through procedures of participant selection in each expansion school and application to the MoNE, which needs mutual cooperation and understanding of the MoNE and the chiefs of the IAT departments in the expansion schools. The MoNE, TTC, expansion schools, and other relevant parties need to continue information sharing and discussions on the teacher training system.

Examining these evaluation results of the teacher training courses and envisioning the future training system, the TTC decided to introduce an e-learning system into the TTC's teacher training. The TTC has initiated the e-learning system development to start new approaches and methods as follows:

- Share the teacher training syllabi, teacher training textbooks, etc. among the past and potential participants in the training, teachers of the IAT departments in the whole Turkey, and other relevant persons (Documents can be uploaded even from outside TTC);
- Share and collect information and discuss among teachers from the IAT departments and other related ones in the whole Turkey;
- Promote self-learning before and after receiving teacher training at the TTC and follow its progress;
- Give home assignments and conduct tests; and
- Conduct questionnaire surveys and automatic aggregate calculation of data from the surveys.

Figure 3.4 shows pages of the e-learning system and the TTC are working on improving and expanding its contents.
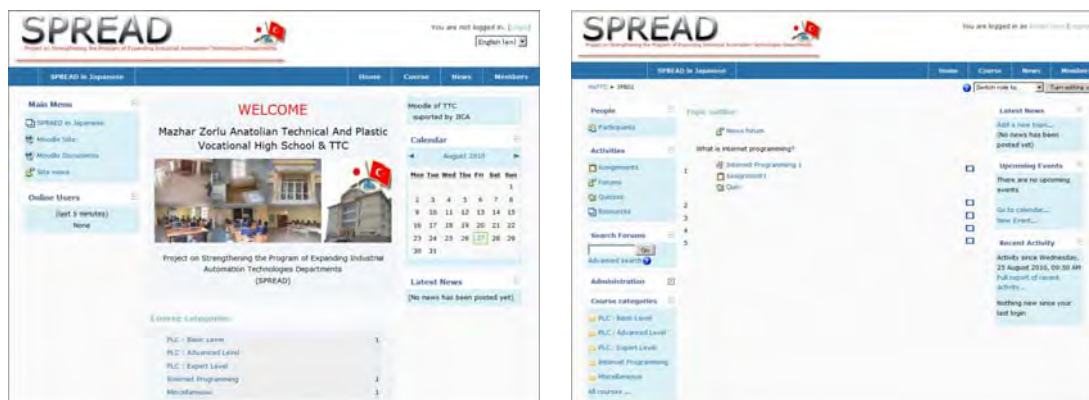
Source: Teacher Training Center and JICA Project Team

Figure 3.4 Pages of the e-Learning System

3.4.3 Monitoring of the IAT Departments of the Expansion Schools

The TTC and JPT monitored the IAT departments of the expansion schools as shown in Table 3.10 in order to provide appropriate teacher training through comprehending the current level of management and classes as well as issues of the expansion schools.

Table 3.10 Monitoring of the Expansion Schools

Expansion schools	Timing
Second Phase (23 schools in total)	
2 schools (Konya and Antalya)	May 5 – May 7, 2008
2 schools (Van and Erzurum)	May 20 – May 23, 2008
2 schools (Corlu and Gebze)	June 3 – June 8, 2008
1 school (Eskisehir)	June 26, 2008
5 schools (Kayseri, Kahraman Maras, Malatya, Gazi Antep, and Ordu)	September 22 – September 29, 2008
2 schools (Afyon and Denizli)	November 20 – November 21, 2008
1 school (Ankara)	November 28, 2008
4 schools (Gaziantep, Sanliurfa, Adana, and Mersin)	December 23 – December 26, 2008
2 schools (Pendik and Bursa)	February 12 – February 13, 2009
1 school (Sanli Urfa)	February 26 – February 27, 2009
Third Phase (5 schools)	
2 schools (Konya and Denizli)	May 31 – June 3, 2009
3 schools (Pendik, Gebze, and Corlu)	June 16 – June 19, 2009

Source: Teacher Training Center and JICA project Team

The TTC and JPT developed an evaluation form for monitoring the expansion schools and compiled information of each school by category such as an outline and current situation of the school, equipment the IAT department possesses, teachers of the department, students and graduates, and requests to the TTC and MoNE. Appendix F compiles the following information:

- Graduates of the IAT departments;
- Courses after graduations of the IAT department graduates; and
- Teachers of the IAT departments.

The information obtained through the monitoring activities was utilized in preparing and implementing the teacher training courses.

3.5   Long-term Strategy of the Teacher Training Center

3.5.1   Organizational Position and Functions of the TTC

The TTC and JPT started examining the future organizational position and functions of the TTC with the MoNE and JICA in the second phase. The MoNE, TTC, JPT, and JICA established the task force and had four meetings between May and August 2009 to confirm and discuss the direction of the TTC and teacher training system in the future. The participants in the task force meetings shared ideas on the future as well as the current situation and issues of the TTC and teacher training.

The future organizational functions of the TTC and roles of the teacher training system were further clarified through other interactions such as the Project Progress Meeting (PPM) held in January 2010 and Terminal Evaluation Study implemented between February and March 2010, based on discussions at the counterpart training in Japan organized in January 2010.

3.5.2   Long-term Strategy of the Teacher Training Center

The TTC and JPT drafted the Long-term Strategy of the Teacher Training Center in September 2009, describing the envisioned missions, policies, objectives, and activities of the TTC, based on the discussion results from the task force meetings, current situation surrounding the TTC, and so on. At a meeting during the counterpart training in Japan organized in January 2010, envisioned organizational position and roles of the TTC and the teacher training system were discussed and the participants in the meeting from both Turkish and Japanese sides agreed on a basic outline of the strategy.

Afterwards, the TTC and JPT finalized the Long-term Strategy of the Teacher Training Center as shown in Appendix G through discussions in the Terminal Evaluation Study and so on. The strategy states the expected future activities of the TTC categorized in the following six items:

1.   Information gathering and enhancement of the TTC's expertise;
2.   Implementation of the teacher training courses;
3.   Holding of project-based workshops for enhancing teachers' expertise;
4.   Provision of consulting service;
5.   Provision of technical and engineering services and training for the industrial members; and
6.   Management of the TTC.

These activities were acknowledged at the 4th Joint Coordinating Committee (JCC) meeting held on August 2, 2010 and the TTC has already initiated a few of them.

3.5.3   Partnership with Other Institutions and Industrial Circles

The TTC actively worked on strengthening partnership with other institutions and industrial circles for conducting cooperative training programs and other activities. The TTC received visitors from various institutions and industrial circles, visited factories of private companies, and discussed future collaborative training and related activities. These activities are one of valuable outcomes of the Project and the TTC will continue these activities to expand the scope of service of the TTC along with the teacher training courses.

(1)   Training Programs for Industry Circles and Other Organizations

Table 3.11 summarizes main training programs that the TTC actually provided for industrial circles and other institutions, utilizing existing laboratory equipment and training materials such

as the teacher training textbooks. Regarding these training programs, it is particularly required to clarify the purpose and contents of training and participants' level of technical knowledge and skills as much as possible for providing fruitful training that satisfies needs and expectation of the participants.

Table 3.11 Training Programs for Industry Circles and Other Organizations

Training Programs	Timing	Numbers of Participants
Second Phase		
Training for teachers from Azerbaijan	November 10, 2008 – December 5, 2008	10
Third Phase		
Training for the chamber of mechanical engineering	November 6, 2009	9 (educational institution: 4, chamber: 2, and industry: 3)
Training for private companies (Philip Morris International Inc.): Pneumatics course	March 21, 2010 – May 7, 2010	27 in total for 3 programs
Training for private companies (Philip Morris International Inc.): Bearing course	March 21, 2010 – April 21, 2010	25 in total for 4 programs
Training for the chamber of industry: Industrial electronics course	April 17, 2010 – May 1, 2010 (3 days)	4
Training for the chamber of industry: Sensor technology course	May 1, 2010 – May 15, 2010 (3 days)	3
Training for private companies (Philip Morris International Inc.): Pneumatic course	May 3, 2010 – May 7, 2010	10
Training for the chamber of industry: Pneumatic course	May 22, 2010 – May 29, 2010	11
Training for the chamber of industry: Hydraulic course	May 22, 2010 – May 29, 2010	12
Training for teachers from Azerbaijan	May 24, 2010 – June 18, 2010	10
Total Number of Participants		**121**

Source: Teacher Training Center and JICA Project Team

(2)   Partnership and Collaborative Activities with Other Organizations

The TTC worked on other various activities in cooperation with other organizations and private enterprises such as SMC Corporation, OMRON Electronics Ltd., and SIEMENS Turkey. Table 3.12 summarizes recent major partnership and collaborative activities with other organizations.

Table 3.12 Partnership and Collaborative Activities with Other Organizations

Enterprises	Main Activities
SMC Corporation	- Staff of the MoNE, principals of the expansion schools, and chiefs of the IAT departments visited Spain to observe technical training system and receive training at SMC Corporation. - The TTC joined an industrial fair held in Istanbul together with the corporation. - The TTC is working to become an accredited training center and issue internationally accepted certificates on behalf of SMC Corporation.
OMRON Electronics Ltd.	- The TTC visited OMRON Electronics Ltd. and received visitors from the company to discuss potential activities for the future. - The TTC is preparing for providing some training courses of OMRON Electronics Ltd. at TTC.

Enterprises	Main Activities
SIEMENS Turkey	- The TTC continues discussions with SIEMENS Turkey to provide training courses at the TTC. - The TTC is preparing an activity plan for the future collaborative activities.

Source: Teacher Training Center and JICA Project Team

The TTC has also started discussions with the MoNE and JICA to provide training for teachers from neighboring countries and initiate collaborative activities with a teacher training center in Mexico and so on.

3.6   Other Activities

3.6.1   Workshops and Meetings

(1)   Project Progress Meeting (PPM)

The Project held the Project Progress Meeting (PPM) to confirm the progress and future schedule of the project activities, and subsequently exchange opinions and ideas on the future among relevant organizations and parties such as the MoNE, Izmir TML, TTC, JICA Turkey Office, JPT, and administrative staff of the expansion schools. Seven meetings of PPM were organized during the Project as shown in Table 3.13.

Table 3.13 Project Progress Meeting (PPM)

PPM	Dates	Participants
1st PPM in Izmir	February 22, 2008	15
2nd PPM in Eskisehir	June 26, 2008	41
3rd PPM in Izmir	October 20, 2008	9
4th PPM in Ankara	January 23, 2009	5
5th PPM in Tekirdag/Corlu	June 18 and 19, 2009	52
6th PPM in Bursa	January 14 and 15, 2010	44
7th PPM in Izmir	May 24, 2010	10

Source: Teacher Training Center and JICA Project Team

(2)   Management Workshop

Management workshops for administrative staff from the expansion schools were organized to share experience and opinions to enhance management of the IAT departments, including representatives from industrial circles in each region. Table 3.14 summarizes the four workshops held in June 2008, June 2009, January 2010, and August 2010.

Table 3.14 Management Workshops for Administrative Staff

Workshops	Main Contents of the Workshops
1st Workshop in Eskishehir on June 26 and 27, 2008*	- Discussion on the monitoring results and current issues of the expansion schools. - Exchange of opinions on assistance for the expansion schools. - Presentation on the outline of the Project, and the TTC's teacher training. - Discussion on internship programs and employment assistance of students. - Tour of a factory of a private company.

Workshops	Main Contents of the Workshops
2nd Workshop in Corlu on June 18 and 19, 2009*	- Presentation on the progress and future activities of the Project. - Discussion on future roles of the TTC and teacher training. - Sharing of experience and ideas that each expansion school possessed. - Exchange of opinions and perspectives including the representatives from industry circles in the region. - Tour of factories and training facilities at private companies.
3rd Workshop in Bursa on January 14 and 15, 2010*	- Sharing information and experience from the counterpart training in Japan organized in January 2010. - Discussion on the future TTC, teacher training, and management system of the IAT departments in Turkey. - Exchange of opinions and perspectives including the representatives from industry circles in the region. - Tour of factories and training facilities at private companies.
4th Workshop in Konya on August 2 and 3, 2010	- Sharing information on situations of each expansion school. - Reconfirmation of the objectives and system of the TTC's teacher training. - Exchange of opinions and ideas on outcomes from the Project and challenges for the future. - Tour of a factory and schools in the region.

* Simultaneous execution with PPM and programs of the workshops were incorporated into those of PPM.
Source: Teacher Training Center and JICA Project Team

(3)   Joint Coordinating Committee (JCC)

The Project convened the Joint Coordinating Committee (JCC) meetings as shown in Table 3.15 to discuss future activities as well as the progress and achievements of the Project. Appendix H compiles brief minutes of the JCC meetings.

Table 3.15 Joint Coordinating Committee (JCC)

JCC	Main Contents of the Meetings
1st JCC in Izmir on November 20, 2007 (44 participants)	The JPT explained the Inception Report containing purpose, tasks, and schedules of the Project, and subsequently the participants actively discussed and exchanged their opinions and ideas.
2nd JCC in Sanliurfa on February 27, 2009 (40 participants)	The participants confirmed the progress and future schedule of the Project as well as results from the Mid-term Review Study conducted in February 2009.
3rd JCC in Ankara on April 14, 2010 (14 participants)	The participants discussed challenges and future activities, considering the results and recommendations from the Terminal Evaluation Study conducted between February and March 2010. The results and recommendations from the terminal evaluation are described in 3.6.4.
4th JCC in Konya on August 2, 2010 (53 participants)	Various actual outcomes from the Project were reported and confirmed among the Participants. It was also mentioned and affirmed that the TTC is the first and unique model in Turkey and will continue and expand teacher training and other various activities even after the Project.

Source: Teacher Training Center and JICA Project Team

Another workshop was held in Izmir on August 14, 2010 as a termination ceremony of the Project with attendance of major related parties from the MoNE, Izmir Provincial Directorate of National Education, and TTC as well as the Embassy of Japan in Turkey, JICA Turkey Office, and JPT. Various achievements from the Project and the scope of future activities were reported and acknowledged among the participants, similar to the 4th JCC meeting held in Konya.

3.6.2   Reports

The TTC and JPT produced and submitted reports shown in Table 3.16, outlining the progress and achievements of the project activities and lessons learned from the Project.

Table 3.16 Reports Produced During the Project

Timing of Submission	Reports
November 2007	Inception Report
February 2008	1st Progress Report
March 2008	Completion Report of the First Phase
August 2008	2nd Progress Report
February 2009	3rd Progress Report
March 2009	Completion Report of the Second Phase
September 2009	4th Progress Report
February 2010	5th Progress Report
June 2010	6th Progress Report
September 2010	Final Report
September 2010	Completion Report of the Third Phase

Source: Teacher Training Center and JICA Project Team

3.6.3   Counterpart Training in Japan

25 persons from the MoNE, Izmir TML, TTC, expansion schools joined training programs implemented in Japan.

Course on Teacher Training System for Industrial Technical Education: December 2 – December 19, 2008
A counterpart training program, the Course on Teacher Training System for Industrial Technical Education, was organized in conjunction with a Young Leaders Training Program, Vocational Training (Industrial Automation Technologies) Course. An official from the MoNE, Vice-principal from Izmir TML, head of the IAT Department of Izmir TML, and 19 heads from the IAD Departments of the expansion schools joined this training program. They visited the Institute of National Colleges of Technology, Japan (INCT), Ibaraki National College of Technology, Gunma University, Gunma Prefecture Education Center, and so on in order to learn about an educational system and teacher training system in Japan and observe the national college of technology and institutions for teacher training.

Management Course for Teacher Training Center: January 3 – January 8, 2010
The primary purpose of this counterpart training was to enhance the vision of the Long-term Strategy of the Teachr Training Center. Mr. Acir (Director General of GDVTE, MoNE), Mr. Yuksel (Department Head of GDVTE, MoNE), and Mr. Caliskan (Principal of Izmir TML) joined the training program implemented in January 2010. They visited the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT), National Center for Teachers' Development, Tochigi Prefecture Education Center, and so on to receive lectures on Japanese teacher training system and teacher training center and observe institutions for teacher training. They also exchanged opinions and ideas on the future TTC and teacher training system after the Project, with the relevant parties from the Japanese side.

Achievements through the training were reported at the management workshop for administrative staff from the expansion schools in January 2010 to share information and experience among the relevant parties for future effective implementation of the Project and fruitful discussions on the future TTC and teacher training system in Turkey.

3.6.4   Terminal Evaluation Study

The Terminal Evaluation Study was conducted from February 23 to March 13, 2010 to review achievements and implementation process of the Project, evaluate activities and achievements of the Project, and formulate recommendations considering the completion of the Project.

The study team evaluated the activities and achievements of the Project based on the five evaluation criteria such as i) relevance, ii) effectiveness, iii) efficiency, iv) impact, and v) sustainability, and subsequently concluded that the Project Purpose would be achieved by the end of the Project and the Project would terminate in September 2010 as scheduled. The study team also recommended activities that are expected to be performed after the project's completion as well as within the project's duration to achieve the Project Purpose, Overall Goal, and Super Goal. Table 3.17 shows the recommendations formulated by the Terminal Evaluation Study.

Table 3.17 Recommendations from the Terminal Evaluation Study

Recommendations
To be done by the termination of the Project
1 **Promote expansion school teachers' understanding on the TTC training and strengthen the monitoring and feedback system for the teacher training** Expansion school teachers' understanding of the teacher training courses should be promoted to resolve difference between their expectations for the teacher training and actual lectures. The monitoring and feedback system should be also strengthened, continuously revising the monitoring and evaluation system in the teacher training manual, to make the courses much fruitful.
To be considered within and after the Project
2 **Strengthen linkage with other organizations for the sustainability of the TTC** The TTC is expanding relationships with relevant enterprises and international institutions. These relationships are expected to be kept and strengthened in order to secure up-skilling of the lecturers of the TTC, necessary budgets, and so on.
3 **Authorize status of the TTC lecturers** It is necessary to clearly define and authorize status of the TTC's lecturers, considering that one of the biggest factors to the Project is the capacity development of them through the Project.
4 **Plan and Implement a new training course on teaching methods** The MoNE and TTC are expected to continue the existing teacher training courses even after the termination of the Project, and also plan and implement a new training course focused on teaching methods that enhance learning achievement of students.
To be considered after the termination of the Project
5 **Establish a training system for university graduates from the Mechatronics departments** Since university graduates from the Mechatronics departments will be allocated to the IAT departments, the MoNE is expected to set up a training system for them.
6 **Expand TTC's achievements to neighboring countries** IAT has high potential for human resource development of various industries, therefore the MoNE and TTC are expected to expand TTC's achievements and know-how on teacher training system to neighboring countries in Central Asia and Middle East.
7 **Expand TTC's achievements to other technical and vocational areas** In the long term, the MoNE is expected to expand the achievements and outputs of the TTC to other technical and vocational areas that need to establish teacher training centers as well as IAT departments.

Source: Minutes of meetings of the Terminal Evaluation Study

The TTC and JPT reviewed the evaluation results and recommendations from the Terminal Evaluation Study and planned strategies and future activities for each recommendation as shown in Table 3.18.

Table 3.18 Strategies and Activities for the Recommendations

Recommendations	Strategy and Future Activities	
	Activities Performed by the Project Completion	Future Activities after October 2010
By the End of the Project		
(1) Expansion school teachers' understanding on the TTC's training	- Further clarified objectives and contents of each course. - Specifically explained the objectives etc. of the course at the orientation and beginning of each course and lecture. - Organized the management workshop for administrative staff from the expansion schools in early August 2010 and discussed the current and future teacher training system, and then share objectives etc. of the teacher training.	- Continue to clarify the objectives and contents of the course when notifying other schools of the course implementation. - Continue to explain the objectives etc. of the course at the orientation and beginning of each course and lecture. - Continue to grasp needs from participants/teachers through monitoring and evaluation and reflect them on the courses.
Strengthening of the monitoring and feedback system	- Reviewed the previous monitoring and evaluation system. - Developed the new monitoring and evaluation system. - Planned monitoring and evaluation schedules and identified persons in charge of each activity. - Revised the teacher training manual incorporating the new monitoring and evaluation system. - Introduced the e-learning system to enhance the TTC's teacher training. New Monitoring and Evaluation System 1. Monitoring of the lectures using the monitoring sheet 2. Questionnaire survey at the last lecture of each subject/course 3. Self-evaluation by lecturers including their evaluation of participants (new activity) 4. Evaluation meeting after each course by all the lecturers of TTC (new activity) 5. Questionnaire survey six months after each course 6. Final evaluation of the course using the evaluation sheet (new procedure) 7. Review of the course curriculum and lecture program (new procedure)	- Continue the monitoring and evaluation activities based on the new system and modify the system according to need. - Strengthen the e-learning system in accordance with the monitoring and evaluation results.

Recommendations	Strategy and Future Activities	
	Activities Performed by the Project Completion	Future Activities after October 2010
Within and After the Project		
(2) Linkage with other organizations for the sustainability of the TTC	- Compiled information on previous and current cooperation activities with other organizations. - Planned future activities and strengthened cooperation with private enterprises such as SMC Corporation, OMRON Electronics Ltd., and SIEMENS Turkey. - Continued to provide training for the chamber of industry and private companies.	- Continue and further strengthen the current activities. - Find potential and necessary actions to expand cooperative activities with other organizations.
(3) Status of the TTC counterparts	- It was officially mentioned at the 4th JCC meeting that the current TTC lecturers continue to provide training even after the end of the Project.	- Continue discussions among authorities concerned depending on the situation.
(4) New training course on teaching method	- Tried new teaching methods during the courses implemented after the Terminal Evaluation Study. - Discussed at the management workshop held in early August 2010.	- Continue discussions among authorities concerned depending on the situation.
After the End of the Project		
(5) Training system for graduates from Mechatronics departments	- Started discussions on necessary training among relevant organizations and parties. - Reconfirmed the number and backgrounds of IAT department teachers in Turkey.	- Confirm the situation and progress of the teacher recruit of the IAT departments from the Mechatronics departments. - Review the teacher training curriculum and syllabi and reorganize the teacher training system.
(6) Expansion of TTC's achievements to neighboring countries	- Identified potential countries and training subjects for third country training by the TTC. - Started discussions on target countries, field, and duration of the training with the MoNE and JICA Turkey Office.	- Continue activities to implement the training programs. - In the long term, provide consulting service and advice for neighboring countries when introducing/enhancing teacher training systems in those countries.
(7) Expansion of TTC's achievements to other technical and vocational areas	- Began studying expansion of a TTC model to other areas.	- Continue studying and discussions to actually initiate activities.

Source: Teacher Training Center and JICA Project Team

3.7   Deliverables and Outputs Produced through the Project

3.7.1   Deliverables Produced through the Project

Table 3.19 shows major deliverables produced through the project activities.

Table 3.19 List of Deliverables Produced through the Project

#	Deliverables	Contents etc.
1	List of the teacher training courses	Section 3.3.3 and Appendix B of this report shows the teacher training courses provided during the Project and those implementation periods. Lecturers of the teacher training were also identified in the first phase.
2	Teacher training curriculum and teacher training syllabi	The teacher training curriculum was newly revised in September 2009 and modified in July 2010, specifying the purpose and framework of the teacher training courses and procedures for modifying the curriculum and syllabi. All the teacher training syllabi were also completed in the third phase.
3	Three-year teacher training plan	The TTC and JPT reviewed TTC's schedules and developed the three-year operational plan in the first phase incorporating teacher training courses.
4	Annual operational plans of the TTC	The annual operational plans of the TTC were developed and continuously updated as shown in Appendix B of this report. The teacher training courses were provided according to these plans.
5	Teacher training textbooks for 10th, 11th, and 12th grades	The TTC lecturers developed the teacher training textbooks based on the teacher training curriculum and teacher training syllabi. All the teacher training textbooks were completed in June 2010 and printed in August 2010.
6	Module textbooks for the 10th, 11th, and 12th grades	The TTC worked on the module textbooks for students of the IAT departments and all of the 43 module textbooks for 10th and 11th grades were completed in the first phase. 50 module textbooks for 12th grade were also completed by December 2009 in the third phase.
7	Monitoring sheets of the teacher training courses and seminars	The form of the monitoring sheet was developed as shown in Appendix D of this report and monitoring results are filed by the TTC lecturers.
8	Evaluation report of the teacher training courses and seminars	The TTC evaluated the teacher training courses and developed the evaluation reports after each course, using the form shown in Appendix E.
9	Monitoring and evaluation reports of the expansion schools	The TTC and JPT prepared the form for monitoring and evaluation of the expansion schools and compiled monitoring and evaluation results after visits to the expansion schools.
10	Implementation plans of management workshops for the IAT departments	The Project prepared implementation plans of management workshops for the IAT departments and four workshops were held as described in 3.6.1.
11	Report on management workshops for the IAT departments	Minutes of management workshops were developed after each workshop and 3.6.1 of this report summarizes main contents of the workshops.
12	Drafted regulation on the organizational positions and functions of the TTC	Organizational positions and functions of the TTC were discussed at the task force meetings and results of discussions were compiled.

#	Deliverables	Contents etc.
13	Long-term Strategy of the Teacher Training Center	The TTC and JPT drafted the Long-term Strategy of the Teacher Training Center in September 2009, describing envisioned missions, policies, objectives, and activities of the TTC. The strategy was finalized through discussions in the Terminal Evaluation Study conducted between February and March 2010.
14	Teacher training manual	The teacher training manual was drafted anew in September 2009 and finalized in July 2010 as the final edition within the Project. The manual describes the organizational structure and roles of the TTC as well as the framework and management of the teacher training courses.
15	Report on the technical assistance from the Japan Assistance Committee	The JPT developed reports on the technical assistance from the Japan Assistance Committee that were provided for developing the teacher training textbooks.
16	Baseline Survey Report	The TTC and JPT conducted the baseline survey to comprehend the situations of the TTC and teacher training system, and subsequently produced the Baseline Survey Report in November 2007. The report compiled information on the policies of the MoNE and educational system in Turkey as well as the TTC and teacher training system.

Source: Teacher Training Center and JICA Project Team

3.7.2   Outputs in Each Phase and Transition

Table 3.20 compiles outputs in each phase and its transition. Parenthetic figures in the table such as "D1" and "D2" indicate the numbers of deliverables described in Table 3.19. Appendix I also shows actual inputs into the Project such as equipment and books purchased for the project activities.

Table 3.20 Outputs in Each Phase and Its Transition

Categories		First Phase	Second Phase	Third Phase
Overall output	Baseline survey (D16)	- Conducted the baseline survey and produced the Baseline Survey Report in November 2007.	N/A	N/A
Planning of the teacher training	Development of the operational plans (D3 and D4)	- Prepared the annual and three-year operational plans of the TTC.	- Developed the annual operational plan of the TTC.	- Developed the annual operational plans of the TTC in May and December 2009 and accordingly updated the plans.
	Selection of the lecturers (D1)	- 26 teachers completed the training and were certified as the lecturers of the teacher training.	N/A	N/A
	Framework (D2)	- Reviewed the framework of the teacher training and set the purpose of teacher training.	N/A	- Revised the teacher training curriculum in September 2009 and modified in July 2010.
	Teacher training courses (D1)	- Developed the list of the teacher training courses.	N/A	N/A
	Module textbooks (D6)	- Completed all the module textbooks for students of 10th and 11th grades.	- Completed 43 out of 50 module textbooks for students of 12th grade.	- Completed all the module textbooks for all the grades by December 2009.
Implementation of the teacher training	Teacher training textbooks (D2 and D5)	N/A	- Developed all the teacher training textbooks for 10th grade. - Worked on the textbooks for 11th grade, 12th grade and summer seminars.	- Completed all the textbooks for 11th grade, 12th grade, and summer seminars. - Reviewed and completed the teacher training syllabi.
	Monitoring of the teacher training courses (D6)	- Monitored the teacher training courses 10 times and shared monitoring results with the lecturers.	- Monitored the teacher training courses 35 times and shared monitoring results with the lecturers.	- Monitored the teacher training courses 74 times. - Developed the new monitoring system.
	Teacher training manual (D14)	N/A	N/A	- Drafted the teacher training manual anew in September 2009 and finalized in July 2010 as the final edition within the Project.

Categories		First Phase	Second Phase	Third Phase
	Management workshop (D10 and D11)	N/A	- Planned the management workshops for administrative staff from the expansion schools. - Held the 1st management workshop on June 25 and 26, 2008 and discussed management system of the IAT departments.	- Organized the 2nd, 3rd, and 4th management workshops in June 18 and 19, 2009, January 14 and 15, 2010, and August 2 and 3, 2010 respectively.
Evaluation of the teacher training	Evaluation methods and criteria (D8)	N/A	- Specified the evaluation methods and criteria and developed the evaluation form.	- Reviewed the evaluation methods and criteria and subsequently developed the new evaluation system.
	Evaluation of the teacher training courses (D8)	- Evaluated the two teacher training courses.	- Evaluated the five teacher training courses.	- Evaluated the nine teacher training courses.
	Evaluation of the expansion schools (D9)	N/A	- Monitored 22 expansion schools in total.	- Monitored 5 expansion schools in total.
	Evaluation of the operational plans (D4)	- Evaluated the annual operational plan of the TTC.	- Evaluated the annual operational plan of the TTC.	- Evaluated the annual operational plan of the TTC.
Long-term Strategy of the Teacher Training Center	Organizational positions and functions of the TTC (D12)	N/A	- Started examining future organizational roles of the TTC.	- Discussed the future organizational roles of the TTC through four task force meetings.
	Long-term Strategy of the Teacher Training Center (D13)	N/A	N/A	- Drafted the Long-term Strategy of the Teacher Training Center in September 2009 - Finalized the strategy during the Terminal Evaluation Study.

Source: Teacher Training Center and JICA Project Team

Chapter 4   Outcomes and Lessons Learned from the Project

As stated in Chapter 3, the Project generated actual and valuable outcomes from the various activities and received favorable feedback from the various stakeholders in Turkey. This chapter summarizes advantages and impacts of the Project, and subsequently major factors that generated valuable outcomes and led the Project to success, as lessons learned from the Project.

4.1   Advantages and Impacts of the Project

The creditable impacts and actual outcomes generated from the Project which were also acknowledged by the various stakeholders are as follows:

- **Developed the 25 teacher training textbooks.**
  Developed the 25 teacher training textbooks for use in the teacher training courses, based on the module textbooks for students, teacher training curriculum, and teacher training syllabi. The total number of pages of the 25 textbooks exceeds 3,500 pages, and these textbooks are also used in training for industry circles and other organizations.
- **Conducted teacher training courses for more than 1,100 teachers in total.**
  More than 1,100 teachers attended in the teacher training courses in total. Quality of the lectures, teaching materials, and experimental equipment were significantly improved during the Project and the TTC's teacher training was highly evaluated by the actual participants, administrative staff of the expansion schools, and other relevant entities from the Turkish educational community.
- **Established and strengthened the TTC teacher training system.**
  Established the TTC's teacher training as the first and unique system in Turkey and strengthened the teacher training system through a series of activities such as planning, implementing, monitoring, and evaluating the teacher training courses. The teacher training manual was also developed, describing the organizational structure and roles of the TTC, framework and management of the teacher training courses, and so on.
- **Provided various training programs for industry circles and other organizations.**
  Provided various training programs for industry circles and other organizations such as the chamber of industry, private companies, and teachers from Azerbaijan, utilizing existing laboratory equipment and training materials including the teacher training textbooks.
- **Formulated the Long-term Strategy of the Teacher Training Center.**
  Formulated the Long-term Strategy of the Teacher Training Center that was approved by both the Turkish and Japanese sides. The strategy specifies envisioned missions, policies, objectives, and activities of the TTC as well as expected future activities, based on the discussion results from the task force meetings, current situation surrounding the TTC, and so on.
- **Strengthened cooperation activities with private enterprise and other countries.**
  Strengthened partnership with private enterprises and other countries, and subsequently started concrete cooperative activities with major private enterprises such as SMC Corporation, OMRON Electronics Ltd., and SIEMENS Turkey. The TTC has also started discussions with the MoNE and JICA to provide training for teachers from neighboring countries and initiate collaborative activities with a teacher training center in Mexico and so on for the future.

4.2   Major Factors of the Project's Success

By reviewing the three years of project activities, the following noteworthy evidence was found as the major factors of the project's success. These factors also serve as part of lessons learned from the Project for conducting other projects as well as for TTC's future activities.

- **Alignment with the Turkish national policies and needs of the industry circles.**
  The Project was consistent with the Turkish national policies and strategies, and there were also high expectations for skilled human resources from the Turkish industrial circles. Therefore the Project could gain the cooperation of the various relevant organizations, which led to effective implementation of the Project.
- **Long-term cooperation between Turkey and Japan and deep understanding of the Project.**
  The good relationship among the MoNE, JICA, TTC, and JPT was one major factor in the efficient implementation of the Project, which was based on Turkish side's deep understanding of the Project through long-term cooperation between Turkey and Japan in this field. In this regard, various training programs held in Japan were also effective.
- **Assigning the requisite number of lecturers and providing competent human resources.**
  As securing and providing necessary human resources is crucial for effective project implementation, the Project to some extent achieved in acquiring the required number of lecturers and competent human resources. The TTC lecturers actually received high evaluation for their performance.
- **Significant financial contribution of the MoNE.**
  Another key factor was significant financial contribution from the MoNE. Using that financial support, the TTC could procure various machines and tools for the teacher training courses. The MoNE also supported each expansion school in procuring experimental equipment and organizing meetings and workshops such as the Joint Coordinating Committee (JCC) meeting and Project Progress Meeting (PPM), which was essential in achieving the actual outcomes of the Project.
- **Presence of leadership and ownership from the Turkish side.**
  Securing sufficient human and financial resources and accelerating leadership are indispensable for the effective implementing of project activities and generating actual outcomes. The Project was able to receive leadership and ownership from the Turkish side, in particular the MoNE, Izmir TML, and TTC, which accelerated and efficiently managed the project activities though a project manager had to be replaced two months before the completion of the Project.
- **Flexible responsiveness and project management of the JICA Project Team.**
  The JPT could flexibly provide technical and practical assistance to the TTC lecturers, depending on the prevailing circumstances such as the progress of each activity. The JPT could also contribute to efficient project management by establishing a close relationship with the lecturers and other relevant parties of the Project.
- **Early discussion about the sustainability after the Project.**
  The Project could establish the task force and start discussions at early stage about organizational position and functions of the TTC, future activities to be conducted after the Project, and so on. These discussions actually deepened relevant parties' understanding of the sustainability and contributed to the commitment to effectively performing each activity in the last phase of the Project.

The teacher training courses and other activities of the TTC are expected to continue and expand even after the Project. Surrounding environments are, however, constantly changing and flexible responses and necessary modifications to the system might be required, considering the factors outlined above and changing in the actual situation around the TTC.

APPENDICES

Appendix A   Project Design Matrix (PDM)

A.1 Project Design Matrix (PDM) Format

Project Design Matrix (PDM) is developed in order to organize project components and plans such as objectives, activities, and inputs of a project, along with their logical interrelationships. A sample PDM format is presented on Table A.1 below.

Table A.1 Project Design Matrix (PDM) Format

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal What will be aimed at after the project purpose is achieved?	Standards for measuring project achievement.	Data sources from which indicators are derived.	Important conditions for the project that are uncontrollable and uncertain.
Project Purpose What should the project achieve within the project duration?	Same as above.	Same as above.	Same as above.
Outputs How should the project achieve the purpose?	Same as above.	Same as above.	Same as above.
Activities What concrete actions should be taken to achieve the outputs?	**Inputs** Personnel, materials, equipment, facilities, and funds required for the project.		Same as above.
			Pre-Conditions Conditions that must be fulfilled before the project gets underway.

Source: PCM-Management Tool for Development Assistance, Foundation for Advanced Studies on International Development (FASID), 2004

A.2 Project Design Matrix (PDM) of the Project

PDM of the Project was modified during the Project reflecting actual project activities and ambient surrounding through a series of discussions between JICA and the authority concerned of the Government of the Republic of Turkey. The modified PDM and initial PDM prepared before the Project began are shown from the next page.

A.2.1   Modified Project Design Matrix (PDM)

Table A.2 Modified Project Design Matrix (PDM) of the Project

Project Title: The Project on Strengthening the Program of Expanding Industrial Automation Technologies Department (SPREAD)	Version. 3.0
Duration: August 2007 to September 2010	Date: February 2009
Target Groups: Management staff, lecturers of Teachers Training Centre (TTC) of Izmir Mazhar Zorlu Anatolian Vocational High School	
Indirect Target Groups: Teachers to be trained at the TTC	

Narrative Summery	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Super Goal Technicians of industrial automation technologies (IAT) are raised and needs of the industrial sector in Turkey for them are substantially satisfied.	Graduates from IAT departments of expansion schools are employed at the highest rate by relevant industries	Employment study report at expansion schools	
Overall Goal Vocational education and training (VET) for IAT at the expansion schools is practiced effectively.	More than 90% of students of IAT departments are evaluated by related industries as very good or good (Evaluation: very good, good, fair or poor) in the internship program of the department.	Records of industry training of students	Turkish industrial sector continue to develop in same growth rate as present Teachers of IAT departments after the training at TTC continue teaching.
Project Purpose Teacher training system of the TTC is established.	<Indicator on teacher training course at the TTC> 1. 90 % of participants assess training courses are practically usable for their lectures and practices for IAT in the questionnaire conducted at the end of the courses. 2. Participants complete and are awarded Course Certificate. 3. 65 % of participants assess the training courses at TTC are practically usable for their lectures and practices for IAT in the questionnaire 6 months after the training based on their experiences in the classes at school. 4. Heads of IAT departments (supervisors of the participants of TTC training) evaluate that the knowledge and skills of the teachers trained by TTC are improved after the training. <Indicator on organization of the TTC> 5. Procedures on management of teacher training course are clarified. 6. Teacher training courses are implemented as planned.	1. Result of questionnaire survey to the participants (conducted at the end of the training courses) 2. Records of the teacher training courses of TTC 3. Result of questionnaire survey to the participants (conducted 6 months after the training courses) 4. Result of questionnaire survey to the heads of IAT department 5-(1). Written document (manual, guideline etc.) about management procedure of teacher training courses in TTC 5-(2). Interview with management staff of TTC 6. Records of the teacher training courses of TTC	Entry of students to IAT Department in the expansion schools is kept in the present level at least. Number of expansion schools is not reduced.

Output 1. TTC's planning capacity of teacher training program is strengthened. 2. TTC's implementation capacity of teacher training courses is strengthened. 3. TTC's evaluation capacity for teacher training is strengthened. 4. TTC's planning capacity of long term organizational strategy is strengthened.	1-1. Curriculum development scheme* is clarified. *The "scheme" means the determined process or guideline for curridulum development, such as procedures for needs identification, objective setting, determination of subject structure and volume, setting of duration etc.* 1-2. Curriculum of teacher training is developed along with the above mentioned scheme. 1-3. The developed curriculum has conformity with the framework curriculum for IAT department authorized by Ministry of National Education. 2-1. Development procedure and format of syllabi and textbooks for teacher training are clarified. 2-2. Each developed training courses has completed textbooks. 2-3. TTC trainers are equipped with the knowledge and skills sufficient to give lectures and practices of the designed training courses. 2-4. All the developed training courses are conducted at least once. 2-5. Logistics such as selection of participants, course notification to the participants, preparation of materials or equipment for each class etc. are well organized. 3-1. Procedure and format for evaluation (incl. feedback of the result) are clarified with explicit criteria. 3-2. Evaluation on teacher training courses is conducted 5 times according to the developed procedures and format 3-3. Procedures and format for monitoring of expansion schools are clarified. 3-4. Monitoring is conducted 20 times at expansion schools according to the developed procedures and format. 4-1. Planning scheme* of long term strategy for TTC is clarified. *The "scheme" means the determined process or guideline for planning of long term strategy for TTC, such as determination of role and function, policy formulation, and operational planning of the center etc.) .* 4-2. Long term strategy of TTC is appreciated by Ministry of National Education.	1-1-(1). Written document (manual, guideline etc.) about curriculum development procedure in TTC 1-1-(2). Interview with trainers of TTC 1-2. Curriculum of teacher training courses 1-3-(1). Curriculum of teacher training courses and framework curriculum for IAT department 1-3-(2). Interview with participants of teacher training courses 2-1. Written document (manual, guideline etc.) and format for syllabi and textbooks development 2-2. List of textbooks 2-3. Interviews with the school principal and vice-principal of the Izmir AML and Japanese experts 2-4. Implementation records for the teacher training courses of TTC 2-5. Result of questionnaire survey to the participants 3-1. Written document (manual, guideline etc.) and format for training evaluation 3-2. Records and results of training evaluation 3-3. Written document and format for monitoring 3-4. Records and results of monitoring 4-1. Written document (manual, guideline etc.) for long term strategy plan of TTC 4-2-(1). Draft or final of long-term strategy of TTC 4-2-(2). Interview with the MoNE	Counterparts remain in TTC

Activities	Inputs	Important Assumptions

Activities
 	
1-1. Baseline survey of IAT Department of expansion schools is conducted.
1-2. Organizational structure of the TTC is arranged.
1-3. Mid-term training plan is reviewed.
 	
2-1. Module textbook is drafted.
2-2. Teacher training courses are planned.
2-3. Teacher training textbook is drafted.
2-4. Equipment for the TTC is installed.
2-5. Orientation for participants is conducted.
2-6. Teacher training courses are implemented.
2-7. Workshops on management of IAT Department are conducted for the expansion schools.
 	
3-1. Standard of evaluation of teacher training courses and evaluation materials are drafted.
3-2. Teacher training courses are evaluated properly.
3-3. Monitoring on VET of IAT at the expansion schools is implemented
3-4. The teacher training course and training textbook is reviewed.
 	
4-1. Role of the TTC in the Long term strategy is identified.
4-2. Long term strategy to operate the TTC is drafted and submitted to GDTVE of the MoNE.
	Inputs
	
	Turkish side:
	• Administrative personnel
	• Project counterparts
	  - Trainers of TTC
	  - Coordinator
	• Office and office equipment for JICA experts
	• Training equipment for TTC
	• Project costs
	  - Expenses for teacher training courses
	  - Salaries and other allowances for the Turkish staffs
	  - Customs clearance, inland handling of the Project equipment provided by JICA
	  - Expenses for maintenance of the Project facilities and equipment
	  - Expenses for electricity, water, gas, fuel and other contingencies
	  - Other necessary local expenses of the Project
	
	Japanese side:
	• Experts
	• Supplemental equipment
	• Counterpart training in Japan
	• Supplemental expenses
		Important Assumptions
		Teachers of IAT Department in the expansion schools are appointed in time
		
		Equipments for IAT departments of expansion schools are prepared at appropriate timing.
		
		Preconditions
		Necessary budgets of TTC are appropriately allocated.
		
		Appropriate number of the project counterparts is assigned.

Source: Minutes of the Terminal Evaluation of the Project, March 2010

A.2.2　Initial Project Design Matrix (PDM)

Table A.3 Initial Project Design Matrix (PDM) of the Project

Project Title: The Project on Strengthening the Program of Expanding Industrial Automation Technologies Department (SPREAD)   Version. No. 2.0

Duration: August 2007 to September 2010   Date: 18 April 2007

Target Groups: Management staff, lecturers of Teachers Training Center (TTC) of Izmir Mazhar Zorlu Anatolian Vocational High School, teachers to be trained at the

Indirect Target Groups: Teachers to be trained at the TTC

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Super Goal Technicians of industrial automation technologies (IAT) are raised and needs of the industrial sector in Turkey for them are substantially satisfied	XX graduates of IAT departments are employed to the relevant factories every year.	Records of carrier guidance committee of schools with IAT Department	
Overall Goal Vocational education and training (VET) for IAT at the expansion schools is practiced effectively	XX students graduate from IAT Departments.	Records of carrier guidance committee of the expansion schools	Turkish industrial sector continue to develop in same growth rate as present
Project Purpose Teacher training system of the TTC is established.	\<Indicator on teacher training course at the TTC\> 1. XX% of participants assess training courses are practically usable for their lectures and practices for IAT. 2. XX % of participants complete teacher training course. 3. Average score of tests \<Indicator on organization of the TTC\> 4. Procedures on management of teacher training course are prepared. 5. Percentage of implemented teacher training courses compared with plan. \<Indicator on long term strategy\> 6. Long term strategy of the TTC receives a due consideration from Ministry of National Education.	1. Teacher training course assessment reports by TTC 2. Records for the teacher training courses of TTC 3. Records for the teacher training courses of TTC 4. Interview with the MoNE	Entry of students to IAT Department in the expansion schools is kept in the present level at least Number of expansion schools is not reduced.
Output 1. Teacher training program of the TTC is planned. 2. Teacher training courses of the TTC are implemented.	1-1. Number of designed teacher training courses 1-2. Number of designed teacher training textbooks 2-1. Number of implemented teacher training courses	1. Records for the teacher training courses of TTC 2. Records for the teacher training courses of TTC	Counterparts remain in TTC

3. Teacher training courses of the TTC are evaluated.	3-1. Evaluation on teacher training courses is conducted XX times 3-2. Monitoring is conducted XX times at all the expansion schools	3. Records for monitoring	
4. Planning capacity of the TTC is strengthened.	4-1. Long term strategy for TTC is finalized.	4. Long term strategy plan by TTC	

Activities	Inputs		Important Assumptions

1-1 Baseline survey of IAT department of expansion schools is conducted.
1-2 Organizational structure of the TTC is arranged.
1-3 Mid-term training plan (2006-2011) is reviewed.
1-4 Module textbook is drafted.
1-5 Teacher training courses are planned.
1-6 Teacher training textbook is drafted.
 	
2-1 Equipment for the TTC is installed.
2-2 Orientation for participants is conducted.
2-3 Teacher training courses are implemented.
2-4 Seminars on management of IAT Department are conducted for the expansion schools.
 	
3-1 Standard of evaluation of teacher training courses and evaluation materials are drafted.
3-2 Teacher training courses are evaluated properly.
3-3 Monitoring on VET of IAT at the expansion schools is implemented.
3-4 The teacher training course and training textbook is reviewed.
 	
4-1 Role of the TTC in the Long term strategy is identified.
4-2 Long term strategy to operate the TTC is drafted and submitted to GDTVE of the MoNE
	Turkish side:
	
	• Administrative personnel
	• Project counterparts
	  -Trainers of TTC
	  -Coordinator
	• Office and office equipment for JICA experts
	• Training equipment for TTC
	• Project costs
	  -Expenses for teacher training courses
	  -Salaries and other allowances for the Turkish staffs
	  -Customs clearance, inland handling of the Project equipment provided by JICA
	  -Expenses for maintenance of the Project facilities and equipment
	  -Expenses for electricity, water, gas, fuel and other contingencies
	  -Other necessary local expenses of the Project
	
	Japanese side:
	
	• Experts
	• Supplemental equipment
	• Counterpart training in Japan
	• Supplemental expenses
			Teachers of IAT Department in the expansion schools are appointed in time
			
			Preconditions
			
			Necessary budgets of TTC are appropriately allocated.
			
			Appropriate number of the project counterparts is assigned.

Source: Project Document of the Project, April 2007

Appendix B   Annual Operational Plans of TTC

The annual operational plans of TTC as of August 2010 are shown in Table B.1.

Table B.1 Annual Operational Plans of TTC

	2007											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Teacher Training Courses for 10th and 11th grades												
Advanced training for teachers of Mechanics and Electronics												
Summer Seminar												

	2008											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Teacher Training Courses for 10th and 11th grades												
Teacher Training Courses for 12th grade			Mar.3-28	Apr.14 -May 9						Oct.6 -Nov.5	Nov.24 -Dec.26	
Summer Seminar					May.26 -Jun.20							
Azerbaijan Training						Jun.30 -Aug.1						
											Nov.10 -Dec.5	

	2009											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Teacher Training Courses for 10th and 11th grades												
										Sep.28 -Nov.6	Nov.16 -Dec.18	
Teacher Training Courses for 12th grade												
Summer Seminar				Mar.23 - May 29							Dec.21-25	
Training for Industrial Circles						Jun.15 - Aug.21						

	2010											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Teacher Training Courses for 10th and 11th grades												
Teacher Training Courses for 12th grade												
Summer Seminar			Mar.22 -Apr.9	Apr.26 -May 14			Jun.14 - Aug.13					
Winter Seminar			Mar.1-19									
Azerbaijan Training						May 24 - Jun.18						
Training for Industrial Circles												

／▮▮▮▮▮ Planned Schedule
▬▬▬▬▬ Actual Schedule

Source: Teacher Training Center and JICA Project Team

Appendix C   Technical Assistance from JPT

Table C.1 summarizes major technical advice and lectures that the JICA Project Team (JPT) provided through the Project, which were utilized not only in developing and enhancing the teacher training textbooks, but were also used in modifying the module textbooks for students in the IAT departments and providing actual teacher training.

Table C.1 Major Technical Assistance from JPT

Technical Assistance	Corresponding Teacher Training Textbooks
Second Phase	
Explanation on a measurement theory and how to use a Position Sensitive Detector (PSD) sensor	Textbook for 11th grade/ Sensor Technology
Preparation of Programmable Logic Controller (PLC) communication experimental equipment using Visual Basic	Textbook for 11th grade/ Programmable Logic Controller (PLC)
Preparation of a system to demonstrate Modbus system and training for using it	Textbook for 11th and 12th grades/ Programmable Logic Controller (PLC) and Supervisory Control And Data Acquisition (SCADA) System
Training exercise for designing a jack	Textbook for 11th grade/ Machine Design
Assembly of a robot for a obstacle race (hurdle race) using the PSD sensor and explanation on how to use	Textbook for 11th grade/ Sensor Technology
Introduction of practical application of a Peripheral Interface Controller (PIC) circuit	Textbook for 12th grade/ Microcontroller I
Re-establishment and repair of laboratory equipment and embedded system (L-Card) and training for using the equipment	Textbook for 12th grade/ Advanced Computer Control
Training on experimental equipment of servo and inverter controlled motors	Textbook for 12th grade/ Actuator II
Design and preparation of a Universal Serial Bus (USB) experimental set	Textbook for 12th grade/ Advanced Computer Control
Preparation of a liquid control system (simulation system using Matlab and Visual Basic)	Textbook for 12th grade/ Automatic Control
Preparation of Digital Signal Processing (DSP) experimental equipment	Textbook for 12th grade/ Advanced Computer Control
Explanation on how to use a Supervisory Control and Data Acquisition (SCADA) system	Textbook for 12th grade/ Supervisory Control And Data Acquisition (SCADA) System
Explanation of an inside mechanism of Solid State Relay (SSR) and Zero-cross function	Textbook for 12th grade/ Automatic Control
Assembly of an AC electric power controller using a PIC system and explanation of how to use	Textbook for 12th grade/ Automatic Control
Preparation of an exercise textbook on a Motor Control Simulation System (SCICOS) using a Proportional Integral Derivative (PID) control method	Textbook for 12th grade/ Automatic Control
Assembly of SCICOS and explanation of how to use	Textbook for 12th grade/ Automatic Control
Assembly of an automatic temperature control system by using PIC as a PID controller	Textbook for 12th grade/ Automatic Control
Assembly of a control circuit board for 3 axis Computer Numerical Control (CNC) machine and explanation of how to use	Textbook for 12th grade/ Automatic Production
Preparation of control programs for 3 axis CNC machine	Textbook for 12th grade/ Automatic Production

Technical Assistance	Corresponding Teacher Training Textbooks
Lecture and preparation of an exercise textbook for a robot-arm kinematics theory of sequence motion and reverse motion	Textbook for 12th grade/ Automatic Production
Introduction and explanation of practical application on a PIC circuit using Light Emitting Diode (LED)	Textbook for summer seminar/ Microcontroller II
Introduction of "Japan's creation course for a robot contest" and contest regulations	General topic
Third Phase	
Lecture on outline and usage of a programmable logic device (PLD)	Textbook for 10th grade/ Digital Electronics
Development of manual of a flow instrument and technical assistance	Textbook for 11th grade/ Sensor Technology
Explanation of theory and using a sensor of Global Positioning System (GPS)	Textbook for 11th grade/ Sensor Technology
Assistance on an interface circuit of a temperature sensor	Textbook for 11th grade/ Sensor Technology
Construction and explanation for each driver on operation and Common Gateway Interface (CGI) for embedded system laboratory equipment	Textbook for 12th grade/ Advanced Computer Control
Construction and explanation for algorism of circular interpolation motion by motor driver in preparation of XY table laboratory equipment	Textbook for 12th grade/ Flexible Manufacturing System (FMS)
Advice on improvement for liquid level control laboratory equipment	Textbook for 12th grade/ Automatic Control
Advice on preparation of PIC experimental device converts of RS-232C by using USB port	Textbook for 12th grade/ Advanced Computer Control
Advice on preparation and selection of embedded system laboratory equipment for expansion schools	Textbook for 12th grade/ Advanced Computer Control
Explanation and advice on operation of robot arm laboratory equipment	Textbook for 12th grade/ Automatic Production
Advice on laboratory equipment and contents for a robot demonstration	Textbook for 12th grade/ Automatic Production
Lecture on an embedded system experiment set including how to use real-time OS and other necessary driver installation	Textbook for 12th grade/ Advanced Computer Control
Assistance on a data acquisition system	Textbook for 12th grade/ Advanced Computer Control
Lecture and practical training on image processing and assistance for programming	Textbook for 12th grade/ Advanced Computer Control
Study equipment of Factory Automation (FA) and assistance on FA system technique	Textbook for 12th grade/ Flexible Manufacturing System (FMS)
Technical assistance on digital electronic circuit design	Textbook for 12th grade/ Advanced Computer Control
Technical guidance on regulating system using network	Textbook for 12th grade/ Advanced Computer Control
Technical assistance for material development on micro-control	Textbook for 12th grade/ Microcontroller I
Technical assistance on speed control of motors	Textbooks for 12th grade and summer seminar/Actuator II and Microcontroller II
Technical guidance on setting method of firewall and authentication method of servers	Textbook for 12th grade/ Industrial Communication System
Lecture on relationships between PLC and CAD/CAM software and CG animation	Textbook for 12th grade/ Supervisory Control And Data Acquisition (SCADA) System

Technical Assistance	Corresponding Teacher Training Textbooks
Technical assistance to control robot systems	Textbook for 12th grade/ Advanced Computer Control
Lecture on GPS application and demonstration	General topic
Lecture and material development on an e-learning system	General topic
Assistance from the Japan Assistance Committee	
Material development on a laboratory experimental set for liquid flow measurement device (Flow Meter)	Textbook for 11th grade/ Sensor Technology
Material development for establishing a SCADA System	Textbook for 12th grade/ Supervisory Control And Data Acquisition (SCADA) System
Material development for establishing an embedded system	Textbook for 12th grade/ Advanced Computer Control
Remote Learning Lecture by JICA-Net System and Turkish SMART Class System	
Lecture on PLC control by Modbus Communication	Textbook for 12th grade/ Supervisory Control And Data Acquisition (SCADA) System
Lecture on NET framework	Textbook for 12th grade/ Internet Programming and Security

Source: Teacher Training Center and JICA Project Team

Appendix D   Monitoring Sheet and Questionnaires for the Teacher Training Courses

D.1   Monitoring Sheet for the Teacher Training Courses

The lecturers of TTC directly observed and monitored lectures during the teacher training courses using the following monitoring sheet.

Code Number: (   )

Monitoring Record (No.)	Observers	Persons Accompanied	Creation Date
Name of Training Course	Name of Subject (Lesson)		
Name of Lecture	Participants	Place	Date

1.   Planning and preparation of lectures
2.   Lecture style
3.   Teaching methods
4.   Participants
5.   Training environment and equipment

Feedback	
Overall comment (Strength, improvement, etc.)	
Self-reflection of the trainer	

D-1

			Exceed Expectation	Satisfy Expectation	Progress to Expectation	Below Expectation
1.Planning and Preparation of Lectures	1	Relevance of introduction/conclusion remarks (Does the lecture provide information about lecture contents at the beginning and/or end of the course?)	4	3	2	1
	2	Preparation of teaching materials (Textbooks, handouts, laboratory equipment, etc.) (Were the textbooks and/or handouts prepared and provided? Are the contents of the textbooks and handouts appropriate for the lectures?)	4	3	2	1
	3	Preparation of course contents by the lecturer (Does the lecturer prepare for the lecture and understand the contents appropriately?)	4	3	2	1
	4	Link with other related subjects (Does the lecture link with other courses well?)	4	3	2	1
	Comments on planning and preparation of lectures.					
2. Lecture Style	1	Voice volume (Is lecturer's voice enough to hear at the back of the classroom?)	4	3	2	1
	2	Effective use of display (Whiteboard, projector, etc.) (Are the lecture contents presented by display equipment such as a whiteboard and projector?)	4	3	2	1
	3	Effective use of teaching materials, experiment sets, equipment, etc.	4	3	2	1
	4	Lecture style in general (Does the lecturer move a lot in the classroom and provide an active lecture?)	4	3	2	1
	Comments on lecture style					

			Exceed Expectation	Satisfy Expectation	Progress to Expectation	Below Expectation
3. Teaching Methods	1	Lecture contents for a participants' level (Are the lecture contents appropriate for participants' level?)	4	3	2	1
	2	Teaching approach (Is a level of the lecture appropriate for the participants? Does the lecturer motivate the participants and draw attention of them?)	4	3	2	1
	3	Understandability of the lecture (Does the lecturer introduce examples and utilize practice in a theoretical lecture and explain theoretical background in practical exercise?)	4	3	2	1
	4	Answers to questions from the participants (Does the lecture appropriately answer to questions from the participants?)	4	3	2	1
	Comments on teaching methods					
4. Participants	1	Participants' understanding of the lecture (Do the participants seem to understand the lecture contents?)	4	3	2	1
	2	Participants' attitude towards the lecture (Motivation, concentration, etc.)	4	3	2	1
	3	Participants' interest in the lecture (Interest in laboratory equipment and practical exercise etc.)	4	3	2	1
	4	Participants' activeness (Do the participants freely ask questions and actively discuss?)	4	3	2	1
	Comments on the participants					
5. Training Environment and Equipment	1	Appropriateness of the classroom (Size, lighting facility, etc.)	4	3	2	1
	2	General equipment (Desks, chairs, etc.)	4	3	2	1
	3	Computers and experimental equipment	4	3	2	1
	4	Tidiness and safety of the classroom and laboratory	4	3	2	1
	Total (Comment for teaching styles in general)					

Source: Teacher Training Center and JICA Project Team

D.2 Questionnaire Surveys at the Last Lecture of Each Subject

D.2.1   Questionnaire

Questionnaire surveys were conducted for the participants in the teacher training courses at the last lecture of each subject. The following questionnaire was newly developed in March 2010.

Mazhar Zorlu Technical and Industrial Vocational High School **Teacher Training Center** **Questionnaire for Evaluation of the Teacher Training Course**			
Please mark the most suitable answer.			
A. Planning and program of the teacher training course	**3 - GOOD** **2 - UNDECIDED** **1 - NOT AT ALL**		
A.1 Duration of the training.	☐ 3	☐ 2	☐ 1
A.2 Dates of the training.	☐ 3	☐ 2	☐ 1
A.3 Consistency between the program and objective of the training	☐ 3	☐ 2	☐ 1
A.4 Appropriateness of the program to the times.	☐ 3	☐ 2	☐ 1
A.5 Suitability of the textbooks and handouts.	☐ 3	☐ 2	☐ 1
B. Lecturers	**3 - SUFFICIENT** **2 - UNDECIDED** **1 - NOT AT ALL**		
B.1 Knowledge and skill on the subject.	☐ 3	☐ 2	☐ 1
B.2 Presentation with appropriate methods and techniques.	☐ 3	☐ 2	☐ 1
B.3 Time management.	☐ 3	☐ 2	☐ 1
B.4 Clarity, understandability, and appropriateness level of the lectures.	☐ 3	☐ 2	☐ 1
B.5 Preparation prior to the lectures.	☐ 3	☐ 2	☐ 1
B.6 Raising motivation of the participants.	☐ 3	☐ 2	☐ 1
B.7 Communication with the participants.	☐ 3	☐ 2	☐ 1
B.8 Conducting of the lectures according to the plan.	☐ 3	☐ 2	☐ 1
B.9 Ability to use educational equipment and tools such as a projector and screen.	☐ 3	☐ 2	☐ 1
B.10 Appropriateness of evaluations such as exams and questionnaire.	☐ 3	☐ 2	☐ 1
B.11 Teaching methods for adult education.	☐ 3	☐ 2	☐ 1
B.12 Methods for having the participants actively join the lectures.	☐ 3	☐ 2	☐ 1
B.13 Consistency between the program and the subject.	☐ 3	☐ 2	☐ 1
B.14 Consistency between the program and fields of the participants.	☐ 3	☐ 2	☐ 1

C. Achievements from the training	3 - YES
	2 - UNDECIDED
	1 - NO

C. Achievements from the training			
C.1 The training satisfied my expectation.	☐ 3	☐ 2	☐ 1
C.2 The training contributed to my technical and teaching skills.	☐ 3	☐ 2	☐ 1
C.3 The training contributed personal improvement such as a communication skill.	☐ 3	☐ 2	☐ 1
C.4 The training gave me necessary knowledge and skills on the subject.	☐ 3	☐ 2	☐ 1
C.5 The training gave me knowledge and skill adapted to the times.	☐ 3	☐ 2	☐ 1
C.6 The training increased my motivation.	☐ 3	☐ 2	☐ 1
C.7 The training gave me new knowledge and skills that I can use in my own field.	☐ 3	☐ 2	☐ 1
C.8 The training gave me new knowledge and skills that I can share with my colleagues.	☐ 3	☐ 2	☐ 1
C.9 The training increased my interest in the subject.	☐ 3	☐ 2	☐ 1
C.10 The training was valuable for me to sufficiently educate students.	☐ 3	☐ 2	☐ 1

D. General Evaluation	YES / NO	
D.1 The number of lecturers was enough for the training.	☐ E	☐ H
D.2 Equipment, devices, and tools used in the training were enough.	☐ E	☐ H
D.3 The participants had necessary basic knowledge and skills prior to the training.	☐ E	☐ H
D.4 Interest and contributions of the other participants were enough.	☐ E	☐ H
D.5 Difficulty level of the training was suitable for my level.	☐ E	☐ H
D.6 The training was beneficial for you in general.	☐ E	☐ H
D.7 Do you want to join the next training course?	☐ E	☐ H
D.8 Do you want to join other training at TTC?	☐ E	☐ H

In order to enhance the teacher training courses at TTC, please state your opinions and suggestions.

A) Teacher Training Center (TTC)

B) Organization and Management of TTC

C) Others

Source: Teacher Training Center and JICA Project Team

D.2.2   Results from the Questionnaire Surveys

This section compiles the results from the recent questionnaire surveys for the participants in the teacher training courses. Questionnaire surveys for the following courses were conducted using a previous form:

- Teacher training course for 10th and 11th grades, basic level 1 (Sep. – Nov. 09);
- Teacher training course for 10th and 11th grades, basic level 2 (Nov. – Dec. 09); and
- Teacher training course for 12th grade, advanced level 2 (Dec. 09).

Teacher Training Course for 10th and 11th Grades, Basic Level 1 (Sep. – Nov. 09)

#	Questions	Percentages of Answers (%)			# of Valid Responses
		Yes	Neutral	No	
1	The training at TTC was valuable for educating students.	80.4	14.3	5.4	112
2	Equipment and materials for the training were sufficient.	88.4	3.6	8.0	112
3	All the subjects were sufficiently taught.	76.8	14.3	8.9	112
4	Amount of practice during the lectures was enough.	58.0	26.8	15.2	112
5	Duration of the training course was enough.	47.3	22.3	30.4	112
6	Information on the equipment and materials were appropriately provided by the lecturers.	87.5	10.7	1.8	112
7	Teacher training textbooks were sufficient to understand the lecturers.	87.5	9.8	2.7	112
8	Subjects were appropriate and fitted the times.	88.4	8.9	2.7	112
9	Classrooms are suitable for the lectures.	94.6	5.4	0.0	112
10	The number of the lecturers was enough.	74.1	4.5	21.4	112
11	Knowledge of the lecturers was sufficient.	98.2	1.8	0.0	112
12	Teaching methods and techniques of the lecturers were adequate.	96.4	2.7	0.9	112

Source: Teacher Training Center and JICA Project Team

Teacher Training Course for 10th and 11th Grades, Basic Level 2 (Nov. – Dec. 09)

#	Questions	Percentages of Answers (%)			# of Valid Responses
		Yes	Neutral	No	
1	The training at TTC was valuable for educating students.	80.6	2.9	16.5	103
2	Equipment and materials for the training were sufficient.	83.5	4.9	11.7	103
3	All the subjects were sufficiently taught.	62.1	7.8	30.1	103
4	Amount of practice during the lectures was enough.	56.3	9.7	34.0	103
5	Duration of the training course was enough.	34.0	31.1	35.0	103
6	Information on the equipment and materials were appropriately provided by the lecturers.	82.5	1.9	15.5	103
7	Teacher training textbooks were sufficient to understand the lecturers.	90.3	1.9	7.8	103
8	Subjects were appropriate and fitted the times.	91.3	1.0	7.8	103
9	Classrooms are suitable for the lectures.	90.3	0.0	9.7	103
10	The number of the lecturers was enough.	77.7	10.7	11.7	103
11	Knowledge of the lecturers was sufficient.	93.2	0.0	6.8	103
12	Teaching methods and techniques of the lecturers were adequate.	90.3	1.9	7.8	103

Source: Teacher Training Center and JICA Project Team

Teacher Training Course for 12th Grade, Advanced Level 2 (Dec. 09)

#	Questions	Percentages of Answers (%)			# of Valid Responses
		Yes	Neutral	No	
1	The training at TTC was valuable for educating students.	75.0	12.5	12.5	16
2	Equipment and materials for the training were sufficient.	100.0	0.0	0.0	16
3	All the subjects were sufficiently taught.	62.5	6.3	31.3	16
4	Amount of practice during the lectures was enough.	56.3	25.0	18.8	16
5	Duration of the training course was enough.	25.0	43.8	31.3	16
6	Information on the equipment and materials were appropriately provided by the lecturers.	75.0	0.0	25.0	16
7	Teacher training textbooks were sufficient to understand the lecturers.	81.3	0.0	18.8	16
8	Subjects were appropriate and fitted the times.	100.0	0.0	0.0	16
9	Classrooms are suitable for the lectures.	100.0	0.0	0.0	16
10	The number of the lecturers was enough.	100.0	0.0	0.0	16
11	Knowledge of the lecturers was sufficient.	81.3	0.0	18.8	16
12	Teaching methods and techniques of the lecturers were adequate.	87.5	0.0	12.5	16

Source: Teacher Training Center and JICA Project Team

Questionnaire surveys for the following courses were conducted using the new form showed in the previous section, D.2.1:

- Teacher training course for 12th grade, advanced level 1 (Mar. – Apr. 2010);
- Teacher training course for 12th grade, advanced level 2 (Apr. – May 2010); and
- Summer seminar (Jun. – Aug. 2010).

Teacher Training Course for 12th Grade, Advanced Level 1 (Mar. – Apr. 2010)

Questions	Percentages of Answers (%)			# of Valid Responses
A. Planning and program of the teacher training course	**Good**	**Undecided**	**Not at all**	
A.1 Duration of the training.	56.4	22.3	21.3	112
A.2 Dates of the training.	77.8	14.2	8.0	112
A.3 Consistency between the program and objective of the training	73.4	20.3	6.3	112
A.4 Appropriateness of the program to the times.	75.7	14.4	9.9	112
A.5 Suitability of the textbooks and handouts.	55.4	26.0	18.7	112
B. Lecturers	**Sufficient**	**Undecided**	**Not at all**	
B.1 Knowledge and skill on the subject.	55.9	35.7	8.5	112
B.2 Presentation with appropriate methods and techniques.	60.2	26.8	13.0	112
B.3 Time management.	55.7	30.3	14.0	112
B.4 Clarity, understandability, and appropriateness level of the lectures.	61.4	26.1	12.4	112
B.5 Preparation prior to the lectures.	61.5	25.4	13.2	112
B.6 Raising motivation of the participants.	59.6	29.8	10.6	112
B.7 Communication with the participants.	74.2	18.8	7.1	112
B.8 Conducting of the lectures according to the plan.	75.9	18.1	6.0	112

Questions	Percentages of Answers (%)			# of Valid Responses
B.9 Ability to use educational equipment and tools such as a projector and screen.	73.7	21.5	4.8	112
B.10 Appropriateness of evaluations such as exams and questionnaire.	65.5	26.8	7.7	112
B.11 Teaching methods for adult education.	69.0	21.7	9.2	112
B.12 Methods for having the participants actively join the lectures.	58.2	33.6	8.2	112
B.13 Consistency between the program and the subject.	60.2	28.6	11.3	112
B.14 Consistency between the program and fields of the participants.	62.2	27.5	10.3	112
C. Achievements from the training	**Yes**	**Undecided**	**No**	
C.1 The training satisfied my expectation.	45.4	34.0	20.5	112
C.2 The training contributed to my technical and teaching skills.	65.3	16.7	18.0	112
C.3 The training contributed personal improvement such as a communication skill.	60.3	20.4	19.3	112
C.4 The training gave me necessary knowledge and skills on the subject.	68.4	16.9	14.7	112
C.5 The training gave me knowledge and skill adapted to the times.	59.1	25.2	15.7	112
C.6 The training increased my motivation.	60.3	20.9	18.8	112
C.7 The training gave me new knowledge and skills that I can use in my own field.	59.2	26.1	14.7	112
C.8 The training gave me new knowledge and skills that I can share with my colleagues.	61.3	21.9	16.8	112
C.9 The training increased my interest in the subject.	71.4	12.7	15.9	112
C.10 The training was valuable for me to sufficiently educate students.	46.0	35.0	18.9	112
D. General Evaluation	**Yes**		**No**	
D.1 The number of lecturers was enough for the training.	48.4		51.6	112
D.2 Equipment, devices, and tools used in the training were enough.	67.7		32.3	112
D.3 The participants had necessary basic knowledge and skills prior to the training.	58.0		42.0	112
D.4 Interest and contributions of the other participants were enough.	72.8		27.2	112
D.5 Difficulty level of the training was suitable for my level.	81.9		18.1	112
D.6 The training was beneficial for you in general.	76.3		23.7	112
D.7 Do you want to join the next training course?	77.7		22.3	112
D.8 Do you want to join other training at TTC?	76.4		23.6	112

Source: Teacher Training Center and JICA Project Team

Teacher Training Course for 12th Grade, Advanced Level 2 (Apr. – May 2010)

Questions	Percentages of Answers (%)			# of Valid Responses
A. Planning and program of the teacher training course.	Good	Undecided	Not at all	
A.1 Duration of the training.	62.8	20.1	17.1	160
A.2 Dates of the training.	82.9	11.6	5.5	160
A.3 Consistency between the program and objective of the training	83.1	15.1	1.8	160
A.4 Appropriateness of the program to the times.	84.4	15.6	0.0	160
A.5 Suitability of the textbooks and handouts.	60.1	29.3	10.7	160
B. Lecturers	**Sufficient**	**Undecided**	**Not at all**	
B.1 Knowledge and skill on the subject.	73.4	25.9	0.7	160
B.2 Presentation with appropriate methods and techniques.	69.8	27.1	3.2	160
B.3 Time management.	72.1	26.6	1.4	160
B.4 Clarity, understandability, and appropriateness level of the lectures.	73.6	23.0	3.4	160
B.5 Preparation prior to the lectures.	72.5	25.5	2.0	160
B.6 Raising motivation of the participants.	76.2	18.4	5.4	160
B.7 Communication with the participants.	79.6	20.4	0.0	160
B.8 Conducting of the lectures according to the plan.	72.2	27.8	0.0	160
B.9 Ability to use educational equipment and tools such as a projector and screen.	78.9	19.7	1.4	160
B.10 Appropriateness of evaluations such as exams and questionnaire.	80.3	17.5	2.2	160
B.11 Teaching methods for adult education.	86.3	12.3	1.4	160
B.12 Methods for having the participants actively join the lectures.	75.1	19.4	5.4	160
B.13 Consistency between the program and the subject.	73.1	25.4	1.4	160
B.14 Consistency between the program and fields of the participants.	68.3	28.1	3.7	160
C. Achievements from the training	**Yes**	**Undecided**	**No**	
C.1 The training satisfied my expectation.	60.2	30.3	9.4	160
C.2 The training contributed to my technical and teaching skills.	76.0	22.0	2.0	160
C.3 The training contributed personal improvement such as a communication skill.	76.0	18.6	5.4	160
C.4 The training gave me necessary knowledge and skills on the subject.	80.6	19.4	0.0	160
C.5 The training gave me knowledge and skill adapted to the times.	77.1	22.9	0.0	160
C.6 The training increased my motivation.	76.6	21.4	2.0	160
C.7 The training gave me new knowledge and skills that I can use in my own field.	74.3	23.7	2.0	160
C.8 The training gave me new knowledge and skills that I can share with my colleagues.	73.8	24.2	2.0	160
C.9 The training increased my interest in the subject.	77.4	20.6	2.0	160
C.10 The training was valuable for me to sufficiently educate students.	67.1	19.2	13.7	160

Questions	Percentages of Answers (%)		# of Valid Responses
D. General Evaluation	**Yes**	**No**	
D.1 The number of lecturers was enough for the training.	90.3	9.7	160
D.2 Equipment, devices, and tools used in the training were enough.	78.3	21.7	160
D.3 The participants had necessary basic knowledge and skills prior to the training.	79.9	20.1	160
D.4 Interest and contributions of the other participants were enough.	86.8	13.2	160
D.5 Difficulty level of the training was suitable for my level.	97.0	3.0	160
D.6 The training was beneficial for you in general.	94.2	5.8	160
D.7 Do you want to join the next training course?	89.3	10.7	160
D.8 Do you want to join other training at TTC?	74.2	25.8	160

Source: Teacher Training Center and JICA Project Team

Summer Seminar (Jun. – August, 2010)

Questions	Percentages of Answers (%)			# of Valid Responses
A. Planning and program of the teacher training course.	**Good**	**Undecided**	**Not at all**	
A.1 Duration of the training.	62.4	9.0	28.7	178
A.2 Dates of the training.	84.3	3.9	11.8	178
A.3 Consistency between the program and objective of the training	91.5	6.2	2.3	177
A.4 Appropriateness of the program to the times.	92.7	5.1	2.2	178
A.5 Suitability of the textbooks and handouts.	82.5	12.4	5.1	177
B. Lecturers	**Sufficient**	**Undecided**	**Not at all**	
B.1 Knowledge and skill on the subject.	90.4	9.0	0.6	177
B.2 Presentation with appropriate methods and techniques.	85.3	14.7	0.0	177
B.3 Time management.	80.5	16.7	2.9	174
B.4 Clarity, understandability, and appropriateness level of the lectures.	82.2	14.9	2.9	174
B.5 Preparation prior to the lectures.	89.6	8.7	1.7	173
B.6 Raising motivation of the participants.	90.2	8.7	1.2	173
B.7 Communication with the participants.	94.2	4.7	1.2	172
B.8 Conducting of the lectures according to the plan.	93.1	6.4	0.6	173
B.9 Ability to use educational equipment and tools such as a projector and screen.	97.0	3.0	0.0	169
B.10 Appropriateness of evaluations such as exams and questionnaire.	92.0	8.0	0.0	163
B.11 Teaching methods for adult education.	93.1	5.7	1.3	159
B.12 Methods for having the participants actively join the lectures.	87.0	11.7	1.3	154
B.13 Consistency between the program and the subject.	90.3	9.1	0.6	154
B.14 Consistency between the program and fields of the participants.	86.7	11.3	2.0	150

Questions	Percentages of Answers (%)			# of Valid Responses
C. Achievements from the training	**Yes**	**Undecided**	**No**	
C.1 The training satisfied my expectation.	82.4	14.4	3.3	153
C.2 The training contributed to my technical and teaching skills.	96.1	2.6	1.3	153
C.3 The training contributed personal improvement such as a communication skill.	92.2	4.5	3.2	154
C.4 The training gave me necessary knowledge and skills on the subject.	94.7	2.6	2.6	152
C.5 The training gave me knowledge and skill adapted to the times.	90.5	8.2	1.4	147
C.6 The training increased my motivation.	91.2	6.1	2.7	147
C.7 The training gave me new knowledge and skills that I can use in my own field.	95.1	4.2	0.7	142
C.8 The training gave me new knowledge and skills that I can share with my colleagues.	95.8	3.5	0.7	142
C.9 The training increased my interest in the subject.	95.8	2.1	2.1	143
C.10 The training was valuable for me to sufficiently educate students.	83.2	11.2	5.6	143
D. General Evaluation	**Yes**		**No**	
D.1 The number of lecturers was enough for the training.	98.6		1.4	143
D.2 Equipment, devices, and tools used in the training were enough.	95.1		4.9	143
D.3 The participants had necessary basic knowledge and skills prior to the training.	84.0		16.0	144
D.4 Interest and contributions of the other participants were enough.	93.7		6.3	143
D.5 Difficulty level of the training was suitable for my level.	89.5		10.5	143
D.6 The training was beneficial for you in general.	99.3		0.7	142
D.7 Do you want to join the next training course?	99.3		0.7	141
D.8 Do you want to join other training at TTC?	97.8		2.2	134

* The total number of respondents was 160.
Source: Teacher Training Center and JICA Project Team

D.3 Questionnaire Surveys Six Months after the Training Courses

D.3.1 Questionnaire

The lecturers of TTC conducted the questionnaire surveys for the chiefs of the IAT departments of the expansion schools as well as the participants in the teacher training courses six months after the implementation of each course. The questionnaire includes the following questions:

For the Participants in the Teacher Training Courses

1) What is your expertise and background (academic experience)?

  1. Electricity   2. Electronics   3. Computer   4. Mechanics   5. Mechatronics

2) Based on your experience in your classes for students, was the training course at TTC practically valuable for the classes?

  1. Very Valuable   2. Valuable   3. Not Valuable

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3) Which field do you prefer to mainly teach at your school after receiving the teacher training at TTC?

    1. Electrics   2. Electronics   3. Computer   4. Mechanics
    5. Industrial Automation (Combination of the other 4 subjects)

4) Which courses do you want to join at the next time?

5) Which courses should be provided considering needs in your school and region?

For the Chiefs of the IAT departments

1) Do you think that teachers of your department enhanced their technical knowledge and skills for educating students through the teacher training at TTC?

    1. Enhanced Very Much   2. Enhanced   3. Not Enhanced (No change)

2) Please describe your opinions and suggestions.

D.3.2   Results from the Questionnaire Surveys

The following tables show the results from the questionnaire surveys conducted in February and June 2010.

Was the training course at TTC practically valuable for the classes?

Answers	The Numbers of Answers and those Percentages			
	February 2010		June 2010	
Very valuable	2	(6.5%)	2	(15.4%)
Valuable	28	(90.3%)	11	(84.6%)
Not valuable	1	(3.2%)	0	(0.0%)
Total	31	(100.0%)	13	(100.0%)

Source: Teacher Training Center and JICA Project Team

Did the teachers enhance their technical knowledge and skills through the teacher training?

Answers	The Numbers of Answers and those Percentages			
	February 2010		June 2010	
Enhanced very much	1	(7.1%)	1	(25.0%)
Enhanced	13	(92.9%)	3	(75.0%)
Not enhanced (No change)	0	(0.0%)	0	(0.0%)
Total	14	(100.0%)	4	(100.0%)

Source: Teacher Training Center and JICA Project Team

Appendix E   Evaluation Sheet and Reports of the Teacher Training Courses

Appendix E shows the forms of a self-evaluation sheet, evaluation meeting report, and final evaluation sheet.

E.1   Self-evaluation Sheet

Subject of the course:	Lecturer:
Target group:	Lecture hours:

Objectives of the lecture:

The level of achievements based on the examination results:

Your opinion about the participants in the lecture:

Provided topics:

Topics	Supported by application?	Completed?

Your opinions for teaching methods of the course subjects and applications:

Source: Teacher Training Center and JICA Project Team

E.2 Evaluation Meeting Report

Training subject:	
Dates of the training:	
Date and time of the evaluation meeting:	
Participants in the training:	
Lecturers:	
Persons in charge of monitoring:	
Participants in the evaluation meeting:	
Opinions from the participants in the training (Based on the questionnaire etc.):	
Opinions and suggestions from the lecturers on the training subject and its implementation	
Opinions and suggestions from the participants in the evaluation meeting:	
Results and decisions:	
Participants' signatures:	

Source: Teacher Training Center and JICA Project Team

E.3 Final Evaluation Report

Final Evaluation Report		Report Number	
Persons in Charge		Date	
Outline of Training Course			
Title			
Period		Place	
Participants			
Lecturers			
Objectives			
Evaluation of the Training Course			
Evaluation Criteria	Description	Comments	
Comparison with the Training Purpose			
Relationship between lectures and practices			
Teaching Methods			
Others (Training Materials and Equipment)			
Affirmative Evaluation from the Participants			
Overall Evaluation (Including Suggestions for Improvement)			

Source: Teacher Training Center and JICA Project Team

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Appendix F   Graduates and Teachers of the IAT Departments

F.1 Graduates of the IAT Departments

Table F.1 shows the number of graduates of the IAT departments.

Table F.1 Graduates of the IAT Departments (2006–2010)

(Persons)

School		2006	2007	2008	2009	2010	Total
1	Izmir	70	48	47	51	47	263
2	Konya*	29	28	23	54	62	196
3	Adana*	---	---	---	28	48	76
4	Ankara*	---	---	---	35	58	93
5	Antalya*	---	---	---	32	46	78
6	Eskişehir*	---	---	---	47	58	105
7	Gaziantep*	---	---	---	32	45	77
8	İstanbul*	---	---	---	42	55	97
9	Kayseri*	---	---	---	35	31	66
10	Kocaeli*	---	---	---	45	43	88
11	Mersin*	---	---	---	36	50	86
12	Van*	---	---	---	15	18	33
13	Afyon**	---	---	---	---	46	46
14	Bursa**	---	---	---	---	41	41
15	Denizli**	---	---	---	---	46	46
16	Erzurmu**	---	---	---	---	52	52
17	Kahramanmaraş**	---	---	---	---	13	13
18	Maltaya**	---	---	---	---	22	22
19	Ordu**	---	---	---	---	54	54
20	Şanlıurfa**	---	---	---	---	14	14
21	Tekirdağ**	---	---	---	---	54	54
Total		99	76	70	452	903	1,600

* First group expansion schools
** Second group expansion schools
Source: Ministry of National Education (MoNE) and each school

F.2 Courses after Graduation of the IAT Department Graduates

The following tables show courses after graduation of the IAT department graduates.

Table F.2 Courses after Graduation of the IAT Department Graduates (2006–2009)

(Persons)

School		Year	Go to University			Find Employment	Total	All Graduates
			2 years	4 years	Sub-total			
1	Izmir	2006	17	27	44	11	55	70
		2007	9	17	26	1	27	48
		2008	24	21	45	1	46	47
		2009	17	28	45	0	45	51
2	Konya*	2006	6	15	21	8	29	29
		2007	12	10	22	5	27	28
		2008	4	14	18	3	21	23
		2009	7	32	39	8	47	54
3	Adana*	2009	16	0	16	2	18	28
4	Ankara*	2009	13	5	18	8	26	35
5	Antalya*	2009	7	19	26	1	27	32
6	Eskişehir*	2009	31	7	38	0	38	47

School		Year	Go to University			Find Employment	Total	All Graduates
			2 years	4 years	Sub-total			
7	Gaziantep*	2009	25	1	26	0	26	32
8	İstanbul*	2009	24	4	28	6	34	42
9	Kayseri*	2009	24	3	27	5	32	35
10	Kocaeli*	2009	36	7	43	2	45	45
11	Mersin*	2009	15	14	29	0	29	36
12	Van*	2009	8	1	9	0	9	15
Total		2009	223	121	344	32	376	452
		2006–2009	295	225	520	61	581	697

* First group expansion schools
The numbers of graduates who go to universities count only those who go to universities in the same year of graduation. Graduates who go to universities after the year of graduation are not included in the figures.
Source: Ministry of National Education (MoNE) and each school

Table F.3 Courses after Graduation of the IAT Department Graduates (2010)

(Persons)

School		Year	Go to University			Find Employment	Total	All Graduates
			2 years	4 years	Sub-total			
1	Izmir	2010	---	---	---	0	---	47
2	Konya*	2010	---	---	---	0	---	62
3	Adana*	2010	---	---	---	0	---	48
4	Ankara*	2010	---	---	---	0	---	58
5	Antalya*	2010	---	---	---	1	---	46
6	Eskişehir*	2010	---	---	---	0	---	58
7	Gaziantep*	2010	---	---	---	4	---	45
8	İstanbul*	2010	---	---	---	3	---	55
9	Kayseri*	2010	---	---	---	0	---	31
10	Kocaeli*	2010	---	---	---	0	---	43
11	Mersin*	2010	---	---	---	0	---	50
12	Van*	2010	---	---	---	0	---	18
13	Afyon**	2010	---	---	---	7	---	46
14	Bursa**	2010	---	---	---	0	---	41
15	Denizli**	2010	---	---	---	0	---	46
16	Erzurmu**	2010	---	---	---	0	---	52
17	Kahramanmaraş**	2010	---	---	---	0	---	13
18	Maltaya**	2010	---	---	---	0	---	22
19	Ordu**	2010	---	---	---	0	---	54
20	Şanlıurfa**	2010	---	---	---	0	---	14
21	Tekirdağ**	2010	---	---	---	15	---	54
Total		2010	---	---	---	30	---	903

All the data is as of July 2010 and the number of graduates who go to universities has not been become clear.
* First group expansion schools
** Second group expansion schools
Source: Ministry of National Education (MoNE) and each school

F.3   Teachers of the IAT Departments

Table F.4 shows the number of teachers from the IAT departments and their backgrounds.

Table F.4 Teachers of the IAT Departments

(Persons)

School		Mechanics	Electricity	Electronics	Computer	Total
1	Izmir	5	4	4	5	18
2	Konya*	2	5	4	2	13
3	Adana*	2	2	3	2	9
4	Ankara*	3	0	4	1	8
5	Antalya*	3	2	1	1	7
6	Eskişehir*	4	3	1	2	10
7	Gaziantep*	2	0	2	1	5
8	İstanbul*	2	3	2	1	8
9	Kayseri*	3	1	3	3	10
10	Kocaeli*	2	2	4	0	8
11	Mersin*	4	1	1	0	6
12	Van*	0	0	0	0	0
13	Afyon**	3	1	3	1	8
14	Bursa**	0	1	2	0	3
15	Denizli**	3	2	2	0	7
16	Erzurmu**	1	1	0	0	2
17	Kahramanmaraş**	1	1	0	1	3
18	Maltaya**	2	1	2	1	6
19	Ordu**	2	1	2	1	6
20	Şanlıurfa**	1	1	0	1	3
21	Tekirdağ**	0	2	0	0	2
Total		45	34	40	23	142

All the data is as of July 2010.
* First group expansion schools
** Second group expansion schools
Source: Ministry of National Education (MoNE) and each school

Appendix G   Long-term Strategy of the Teacher Training Center

Long-term Strategy of TTC

February 24, 2010

Introduction

The Project was required to provide the Ministry of National Education (MoNE) with the Long-term Strategy of the Teacher Training Center (TTC) and clarify its development procedure. One of reasons for formulating the Strategy is presumed that a TTC's position and its expected roles and missions were not fully specified at the beginning of the Project. In order to meet the requirements, the Project clarified the TTC's position and expected roles and missions, and subsequently formulated the feasible Strategy of TTC that includes "Missions", "Policies", "Objectives" and "Activities" as well as a chart describing main activities and relevant organizations of TTC.

1.   Precondition

All of the relevant organizations and parties of the Project agreed that TTC is an affiliated organization of the Izmir Mazhar Zorlu Technical and Industrial Vocational High School (Izmir TML), and the Strategy was developed based on this precondition.

2.   Missions of TTC

TTC had been established and have been managed based on achievements from cooperation projects between the Turkish and Japanese governments. TTC is expected to be continuously operated even in the future, in accordance with projects' objectives that aim to provide industry sectors with qualified mid-level technical human resources in a rapidly-advancing Industrial Automation Technologies (IAT) field.

The Turkish industrial sectors, especially manufacturing industries, are on course to develop and also expected to continue to grow in the future. There is no doubt that needs for the qualified human resources in IAT and IAT related fields maintain an upward trend even in the future.

As one of the organizations to realize the objectives and an unprecedented organization in Turkey, TTC clarified missions of TTC as follows:

i.   TTC accumulates the latest information and technologies on IAT and its related fields;
ii.   TTC becomes a human resource development center in technical and vocational education areas of IAT and relevant technical fields, involving neighboring countries of Turkey; and
iii.   TTC provides information and technical services for schools and industrial sectors.

3.   Policies of TTC

i.   TTC continuously improves its technical expertise in the advancing IAT field, including international technical exchanges with similar organizations to TTC in other countries.
ii.   TTC provides technical and vocational training for teachers and industrial members under the current information and technology.
iii.   TTC creates a new teacher training model in the Turkish national education system.
iv.   TTC cooperates with the regional industrial sectors for its technical development;.
v.   TTC aims to become an information and technical center in IAT and its related technology fields in Turkey.
vi.   TTC plans its activities to fully utilize accommodation facilities of TTC throughout the year.

4.   Objectives of TTC

i.   Accumulate information and technologies in IAT and IAT-related fields to provide appropriate services for customers.
ii. Enhance professional and practical competence of teachers in IAT and its related fields.
iii. Fulfill a role as the information and technical support center for IAT departments and its adjacent departments.
iv. Promote cooperation activities between industry and academia.
v.   Provide information, technical and engineering services for industrial members in the region.

5.   Activities of TTC

i.   Information gathering and enhancement of the TTC's expertise
   • Information gathering in the IAT field as daily activities.
   • Collaborative study meeting on different technical topics by members of TTC (twice a year).
   • Technological exchange with Mechatronics departments of universities (once a year).
   • Workshop with the industrial sectors (once a year).
   • Public lecture on topics of the IAT field (twice a year).
   • International technical exchange with the same kinds of organizations in foreign countries.

ii. Implementation of teacher training courses
   • Teacher training courses for teachers from the IAT departments (normal and brush-up training courses).
   • Package training for the teachers of the IAT departments (one/two-week(s) package depending on subjects).
   • Long-distance training by a Video-TV conference system.
   • Package training for teachers from other relevant departments of the IAT field, not only in Turkey but also in neighboring countries (three different simultaneous packages).

iii. Holding of project-based workshops for enhancing teachers' expertise
   • One-week workshop for enhancing teachers' expertise targeting one topic, organized every two months by 7 or 8 team members including TTC staff.

iv. Provision of consulting service
   • Professional service to promote appropriate utilization of technologies through support of teaching, learning, and leadership for the teachers and the industrial members.
   • Project activities for productivity improvement at companies.

v.   Provision of technical and engineering services and training for the industrial members
   • Package training for industrial members in IAT and IAT-related fields.
   • Technical training workshops.
   • Certification training program.
   • Training for unemployed persons.
   • Technology fair targeting the IAT field.

vi. Management of TTC
   • Material preparation for training and services.
   • Revision of module textbooks and teacher training textbooks of the IAT departments.
   • Management and operation of TTC.
   • Documentation management for the activities of TTC.

Conclusion

A strategy of an organization is their guiding principle for the future goals and to give relevant parties a firm intention for the present and future existence of the organization. An action plan for attaining objectives should be separately prepared according to the strategy. Necessary resources such as human and financial resources should be decided based on the action plan.

Table 1 General Annual Program of TTC after SPREAD

Activities	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Description
i) Information gathering and enhancement of expertise															
Collaborative study meeting				⇧						⇧					
Technological exchange with universities						⇩									
Workshop with the industrial sectors	△												△		
Public lecture		◎						◎							
International technical exchanges															Not yet identified
ii) Teacher training courses															
Normal training course for the IAT dept.*	◄——►			◄——►								◄——			
Brush-up training course for the IAT dept.		▭							▭						
Package training for the IAT dept.	◇		◇		◇		◇		◇		◇ ◇		◇		
Package training for other relevant dept.		○		○		○		○		○	○ ○			○	3 simultaneous packages
Training for teachers from neighboring countries															Not yet identified
iii) Project-based workshops															
One-week workshops	⬍		⬍		⬍		⬍		⬍		⬍		⬌		
iv) Consultancy Services															Not yet identified
v) Technical and engineering services															
Package training for industrial members	∑			∑			∑			∑			∑		
Technical training workshops					▷						▷				
Certification training program															Not yet identified
Training for unemployed persons															Not yet identified

* Including teachers from other new 15 IAT departments and new teachers with a background of "Mechatronics"

Table 2 Summary of the Long-term Strategy of TTC

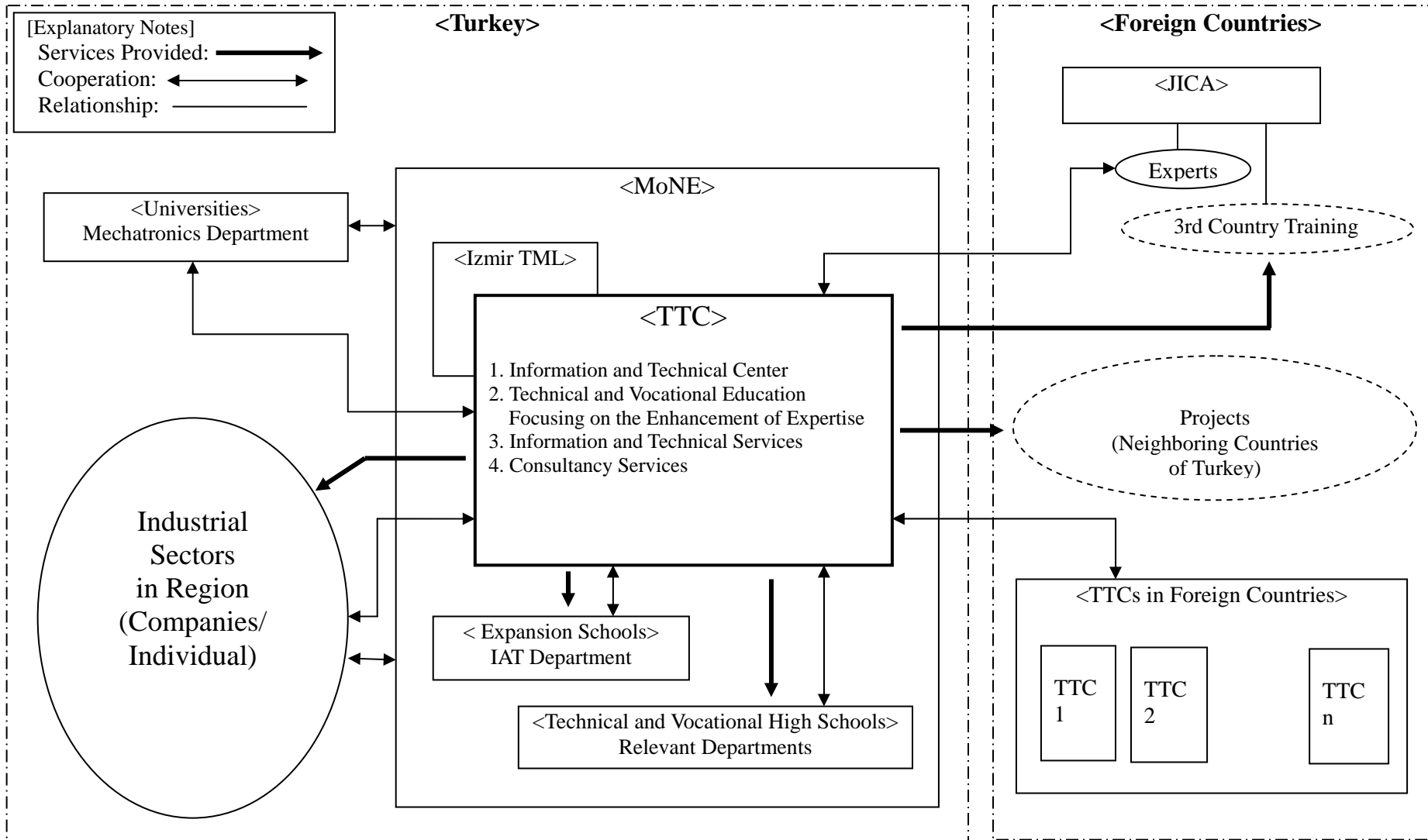|	Item	Description
1	Precondition	TTC is an affiliated organization of the Izmir Mazhar Zorlu Technical and Industrial Vocational High School (Izmir TML).
2	Missions	i. TTC accumulates the latest information and technologies on IAT and its related fields. ii. TTC becomes a human resource development center in technical and vocational education areas of IAT and relevant technical fields, involving neighboring countries of Turkey. iii. TTC provides information and technical services for schools and industrial sectors.
3	Policies	i. TTC continuously improves its technical expertise in the advancing IAT field, including international technical exchanges with similar organizations to TTC in other countries. ii. TTC provides technical and vocational training for teachers and industrial members under the current information and technology. iii. TTC creates a new teacher training model in the Turkish national education system. iv. TTC cooperates with the regional industrial sectors for its technical development;. v. TTC aims to become an information and technical center in IAT and its related technology fields in Turkey. vi. TTC plans its activities to fully utilize accommodation facilities of TTC throughout the year.
4	Objectives	i. Accumulate information and technologies in IAT and IAT-related fields to provide appropriate services for customers. ii. Enhance professional and practical competence of teachers in IAT and its related fields. iii. Fulfill a role as the information and technical support center for IAT departments and its adjacent departments. iv. Promote cooperation activities between industry and academia. v. Provide information, technical and engineering services for industrial members in the region.
5	Activities	i. Information gathering and enhancement of the TTC's expertise. ii. Implementation of teacher training courses. iii. Holding of project-based workshops for enhancing teachers' expertise. iv. Provision of consulting service. v. Provision of technical and engineering services and training for the industrial members. vi. Management of TTC.

[Explanatory Notes]
Services Provided:
Cooperation:
Relationship:

<Turkey>

<Foreign Countries>

<Universities>
Mechatronics Department

<MoNE>

<JICA>

Experts

3rd Country Training

<Izmir TML>

<TTC>

1. Information and Technical Center
2. Technical and Vocational Education
   Focusing on the Enhancement of Expertise
3. Information and Technical Services
4. Consultancy Services

Projects
(Neighboring Countries
of Turkey)

Industrial
Sectors
in Region
(Companies/
Individual)

< Expansion Schools>
IAT Department

<Technical and Vocational High Schools>
Relevant Departments

<TTCs in Foreign Countries>

TTC
1

TTC
2

TTC
n

Figure 1 Main Activities and Related Organizations of TTC

Appendix H   Minutes of the JCC Meetings

Appendix G compiles brief minutes of the four Joint Coordinating Committee (JCC) meetings.

H.1   1st JCC Meeting in November 2007

Date: November 20, 2007
Venue: Izmir Mazhar Zorlu Anatolian Vocational High School (Izmir Mazhar Zorlu AML)
Participants: 44 (MoNE, SPO, Regional Education Directorate, TTC, Chamber of Industry, Expansion Schools, JICA Turkey Office, and JPT)
Program:

1. Welcome Address

2. Opening Remarks

3. Speeches   • Mr. Kâmil AYDOĞAN, National Education Director of Izmir Province   • Mr. Satoshi UMENAGA, Deputy Resident Representative, JICA Turkey Office   • Mr. Nadir ERDİR, Member of Education Committee of EBSO (Aegean Region Chamber of Industry)   • Mr. Hüseyin ACIR, Director General, GDTVE, MoNE   • Mr. Mustafa DÜNDAR, Head of Bornova District

4. Presentations on Project Activities   Mr. Yücel YÜKSEL, Head of Department, GDTVE, MoNE

5. Presentation on the Project Implementation Plan   Dr. Hideo NAKAMURA, Chief Advisor, JPT

6. Presentation on the Teacher Training Center (TTC)   Mr. Satı ÇALIŞKAN, Principal, Izmir Mazhar Zorlu AML

7. Presentation and Speeches   • Principals from the Expansion Schools   • In-Service Training Department   • Training Materials and Equipment Department   • Investments and Facilities Department   • State Planning Organization (SPO)

8. Discussion

9. Closing Remarks

Speech by Mr. Kâmil AYDOĞAN, National Education Director of Izmir Province
Mr. AYDOĞAN made a speech, focusing on the importance of expanding vocational education in all over the country.

• We always aim to raise all our technical and vocational schools to a higher standard and make them possible to send well trained technicians to the industry. A required level of

expanding vocational education is being obtained in recent years.

- Generally, in case of having a problem in education, the most incorrect way is to look for reasons at external factors. But actually, first of all, quality of education and teachers has to be examined in order to eliminate potential problems as well as raise the quality of education. After starting to follow this way, parents became more willing to send their children to vocational education schools.
- When making speeches for media, I always mention Izmir Mazhar Zorlu AML as an example because of its high quality education. Students can have chances to find employment in industry even after 11th grade. It can be definitely stated that schools, having the same quality with Izmir Mazhar Zorlu AML, do not have any trouble to find new students.
- The project to expand IAT departments will not only contribute to expanding the departments, but also contribute to expanding vocational education in all over the country. An image of technical and vocational education in Turkey will be changed in positive aspect.
- On behalf of the National Education Directorate of Izmir, I would like to express that we are so glad to have such a meeting in our province and wish success.

Speech by Mr. Satoshi UMENAGA, Deputy Resident Representative, JICA Turkey Office

Mr. UMENAGA made a speech and mentioned the importance of human resource development in education fields as well as technical cooperation between the Turkish and Japanese governments.

Speech by Mr. Nadir ERDİR, Member of Education Committee of EBSO (Aegean Region Chamber of Industry)

Mr. ERDİR focused on the importance of cooperation between technical and vocational schools and industry circles in each region.

- We, Education Committee of the EBSO, are so glad to be together with authorities from the MoNE and Japanese Experts as well as the school principals again after a long time.
- Izmir Mazhar Zorlu AML has high-level education and it should be known that it is because of close cooperation of this school with Izmir industry from 2000. The school principal and his staff always make great effort to keep this close relationship with us through inviting industrial people to the school, organizing meetings to discuss necessary points, and receiving comments on their educational programs.
- It is clear that the Turkish industry needs well trained qualified mid-level technical human power. Industry expects to receive students as trainees from technical and vocational high schools. Therefore, industry needs more these kinds of schools, providing mid-level technicians with high level technological knowledge and skills.
- We also know other vocational schools in our region, but there is an obvious difference to Izmir Mazhar Zorlu AML. My recommendation to the principals of the expansion schools is to keep close contact with the industry in their region and request any kind of support for ensuring consistency between needs of industry and educational programs of the schools.
- The Education Committee of the EBSO received two requests from the GDTVE, based on our observations and discussions with the schools.
    - Some renovations on a revolving fund system in vocational schools should be done. We believe that the share, given to vocational teachers from the revolving fund, is not enough. Since the most important key factor is teachers for providing high quality education, they should be improved to better conditions.

- There is a big request for enrolling to vocational schools, but new enrollments are accepted based on a certain system in schools. Another request from the GDTVE is to have a certain quota for children of industrial people in related regions.

Speech by Mr. Hüseyin ACIR, Director General, GDTVE, MoNE
Mr. ACIR mentioned the following points in his speech.

- When I was first assigned to my duty in 2003, the previous JICA project was being implemented in two pilot schools in Izmir and in Konya. This project was very important for us because very significant activities, such as development of a new educational program, new textbooks, training materials, etc., were conducted by Japanese experts and Turkish Counterparts. In order to ensure smooth project implementation, various meetings were held with participation of all concerned people from the Japanese and Turkish sides. In accordance with an agreement between two governments, this project was terminated in April 2006.
- After a new project was proposed to JICA, several studies were done in Turkey by Japanese study teams and a new project was approved. The agreement for the project was signed in May 2007 and then assigned Japanese experts came to Turkey in September 2007 for performing project activities.
- As known, technical and vocational education is an inevitable field for development in all over the world. GDTVE's main targets are:
  - To raise technical and vocational education system to standards of the EU and other developed countries,
  - To strengthen the system through socio-economic needs and life-long learning principles.
  This approach will provide an infrastructure for the establishment of a modern, flexible and qualified technical and vocational education system, which is integrated with the higher education systems and can meet needs of industrial sectors.
- In our country, technical and vocational education has a structure, supported by development plans, government plans, and council decisions. Financial resources, used for the technical and vocational education, can be listed as:
  - Resource from general government budget;
  - Resource from international projects; and
  - Resource from the industrial sector as donation.
  The MoNE is always trying to increase the quality of education by using these financial resources.
- For the time being, various national and international projects are under implementation in different fields. These projects play an important role for quality improvement of technical and vocational education. For this reason, our Ministry cooperates with the European Union, World Bank and some countries like France, Germany, Italy, Japan, Spain, Slovenia as well as leading enterprises in our country, and implements various projects in order to:
  - Develop educational programs;
  - Train technical teachers in and out of the country;
  - Transfer new technology to schools;
  - Equip laboratories and workshops; and
  - Provide financial resource except general government budget.
- Among the international projects, besides the JICA projects, one of the most important projects is MEGEP = SVET (The Project on Strengthening the Technical and Vocational Education System in Turkey). The SVET was inaugurated on September 30, 2002, with a total period of 5 years. General purposes of the project are:

- To provide quality and appropriateness of vocational education system at secondary education level through creating and implementing a national qualification system;
- To strengthen institutional capacity of public institutions, social associations and enterprises, based on national, regional and local levels; and
- To accelerate localization process of a system through including local partners into the implementation of reforming process.

A total budget of the project is 58.2 million euro. 51 million euro of that is provided by the European Union, and the other part is financed by the Turkish Government.

- Through this project, the Turkish education system was renewed as 4 years for all kinds of secondary education schools. Based on the new system, 9th grade is common for all schools. 10th and 11th grades give basic technical and vocational subjects and 12th grade focuses on specialty education on related fields.

- Students can leave schools after each grade and obtain certificates by the Vocational Qualification Institution. After graduation from 4 year-education, diploma, transcript and a certificate for opening an independent working place will be given.

- The educational programs were completely rearranged. Departments, around 300 all over Turkey, were carefully searched through human power survey studies. As a result of these studies, the departments in related fields were combined under 42 main fields and 197 branches.

- The Vocational Qualification Institution was officially established and regulation studies of this institution are still carried on.

- Since monitoring graduates is very important, a section called "Education-Employment and Graduate Monitoring Section" is created under the Educational Research and Development Department. Total 63 technical and vocational secondary education institutions were decided as pilot schools in total 24 cities, for monitoring the graduates of 2002, 2003 and 2004. Related to the monitoring, a web page is also prepared for students, graduates, schools and employers, with the address of "http://emezun.meb.gov.tr".

- As a result, our main target can be summarized as "to bring our country to a competitive and dynamic level in the world with advanced technological knowledge and sustainable economy, by rising up quality of technical and vocational education".

Speech by Mr. Mustafa DÜNDAR, Head of Bornova District

Mr. DÜNDAR, as a host in Bornova District, made a short welcome speech to participants from different cities and expressed his good feelings for having such a successful international project in a school in Bornova, by wishing success to the expansion schools.

Presentation on the Project Activities by Mr. Yücel YÜKSEL, Head of Department, GDTVE, MoNE

Mr. YÜKSEL made a presentation on project activities by summarizing the following points:

- Project preparation;
- Signing a project agreement and inauguration of the project;
- Project activities;
- Inputs by Turkish and Japanese sides; and
- Relationship between the project and national strategy.

Presentation on the Project Implementation Plan by Dr. Hideo NAKAMURA, Chief Advisor, JPT

Dr. NAKAMURA made a presentation on the project implementation plan.

- Project's outlines;
- TTC training management system;
- Implementation policy;
- Implementation structure;
- System establishment steps;
- PDCA approach;
- IAT departments and teacher training;
- General annual plan;
- Main project activities;
- Main modifications in the Project Design Matrix (PDM) and Inception Report; and
- Considerations for a success of the project.

Dr. NAKAMURA stated that the main modifications in PDM were made on expressions of verifiable indicators of the Super Goal and Project Purpose, which were decided in accordance with the results of the baseline survey, conducted by the project. After his presentation, Mr. ACIR, chairman/Director General, expressed that the modifications in the PDM and Inception Report were already examined by related authorities of the GDTVE and found as suitable. He also announced that the Inception Report is officially confirmed.

Presentation on the Teacher Training Center (TTC) by Mr. Satı ÇALIŞKAN, Principal, Izmir Mazhar Zorlu AML

Mr. ÇALIŞKAN made a presentation on TTC's training activities. He proposed to Turkish authorities to re-open the IAT departments in Anatolian Technical High Schools. He also showed a demonstration video to introduce a 2nd Robot Contest and provide information about the contest.

The 2nd Robot Contest will be organized on February 22-23, 2008 by the cooperation of the MoNE and JICA Turkey Office and a main theme of the contest is "Conquest of Istanbul". The contest will be open for any kind of high school and university students individually as well as groups formed by students and their teachers jointly. The contest will be composed of three categories: category with defined theme; line tracer category; and free category.

Presentation and Speeches

Among 20 expansion schools, 19 school principals joined the meeting. A principal of Sanlıurfa was absent because of an important private problem. Principals made presentations on current situation of their schools and operation of the IAT Departments.

Antalya
- As a first group expansion school, school building modification studies for the IAT department were started in 2004. There are a total of 156 students in our department as 9th, 10th and 11th grades.
- Except 12th grade's equipment provision, there is not any problem in both educational and equipment point of view. The laboratories and workshops were ready before starting related grade education.
- Our school is always in cooperation with industrial companies and related chambers in our region. Industrialists are willing to accept our graduates as employees. Necessary contacts were already made with the industrial companies to arrange factory training places of the students.

Gaziantep
- 90% of equipment provision is completed. At present, 60 computers are in use in our school. One important point about equipment is a warranty period of a CIM laboratory

that is established for 12th grade education. Expiry date will be over this year. We would like to ask related authorities if there is any way to extend the warranty period of the CIM laboratory equipment.

- The current department' students are 140 in total. In order to improve a success rate of students, mathematics subject was taken into educational program as compulsory subject. We also opened short-term courses of needed subjects for the students.
- A "Bomb Destroying Robot by Remote Control" was made by our teachers. Additionally, our students join fairs and contests using robots made by themselves.
- We proposed to the Ministry to give summer seminars (in-service-training) in 2008.

Konya
- Education in our school is successfully carried on by our specially selected and well-trained department teachers.
- Since Konya school was also a pilot school of the previous project, there is not any problem on both completion of laboratories and technical level of teachers. We hope all the expansion schools reach to the same level with our school.
- Summer seminars are provided every year.

Mersin-Tarsus
- 6 teachers of the department received training in the TTC for 9th, 10th and 11th grades.
- Almost all necessary equipment and materials are provided.
- Most of the students, who want to enroll this department, aim to go to universities after graduation. But, when they learn that it is very difficult to go to universities after graduation from an Anatolian Vocational High School, they give up enrolling this department. Because of this reason, we believe that it is necessary to open IAT departments in Anatolian Technical High Schools again.

After presentations by the expansion schools' principals, the chairman stated that all the problems that the schools faced with are known by the GDTVE. Necessary actions will be taken to the extent possible.

Other important topics in speeches by concerned people were as follow.

In-Service Training Department:
- In-service-training courses in 2008 are already announced.
- It is great pleasure to see successful training activities in the TTC as results of enormous efforts, given by all the concerned people of the both sides, from the beginning of the previous project.
- We believe that TTC's teacher training in an industrial automation field will be very useful for teachers, who will have duty in the IAT departments in the expansion schools. As the In-Service-Training Department of the MoNE, we will try to do our best for continuation of these activities.

Training Materials and Equipment Department
- The IAT Department has the first priority in our department the first group 10 schools were equipped almost completely. For the second group 10 schools, we included necessary procurement into our first procurement plan in 2008.
- We believe that feedback should be taken for procured equipment about their suitability for the aim. Necessary detailed discussions should be done on this point.

Investments and Facilities Department
- If schools need to make some modification or repair their school buildings, they should send necessary documents in April 2008, including details of works and total cost calculated by a related department. In this case, a needed amount of budget will be sent to the schools from the budget of the GDTVE.

State Planning Organization (SPO)
- On behalf of the SPO, I am very happy to be involved in the meeting, organized at the building of the Teacher Training Center (TTC). We, as the SPO, tried to give our best effort for the construction of this building.
- Although the SPO is not the unit allocating budget to related institutions, we will have necessary discussions with related departments and request budget allocation and equipment procurement for the TTC.
- Besides requesting equipment from the government, schools should also request to get some equipment donations from a related industry in their region. Because a main aim of these departments is to train qualified technical human resource for the industrial sector.

Board of Education
- There is an ambience here, which motivates the concerned people to do their best. It is very impressive to see that all regional differences are overcome successfully. The main reason, I suppose, is to believe the main aim as a team.
- I will convey all my positive impressions to my authorities in Ankara. And I wish success to all the concerned people, who succeeded to establish and operate the TTC successfully.

Discussion about the Speeches and Presentations
Mrs. BARKÇIN from the SPO gave a comment about an indicator of the Super Goal in the PDM: "Graduates from the IAT departments of the expansion schools are employed at the highest rate". She suggested that a numerical percentage, which is targeted as an employment rate for graduates of the IAT departments, should be expressed in this indicator.

Dr. NAKAMURA replied that it is difficult to set a common target for all the expansion schools because industry of each region greatly differs. The compulsory military service is another factor that affects the employment rate in Turkey. These are reasons of describing "employed at the highest rate".

Mrs. BARKÇIN also expressed that she agreed with Mr. NAKAMURA about the importance of providing better motivation to the counterparts as well as all the teachers in this project, in order to be able to get better results from the project activities and the training courses.

Mr. ACIR, Director General, stated the following two points.

Insufficient motivation of the counterparts and other expansion schools' teachers
This situation is because of a regulation made in December 2006 that is related to a payment of a lecture fee. A series of studies are still carried on for getting requested improvements for the teachers and requests for necessary changes on the mentioned regulation were already conveyed to the Personnel Department of our Ministry. But changing this regulation is not related only with our Ministry, but also the Ministry of Finance and other related Ministries, and then the last decision has to be made by the Council of Ministers. We hope we can get satisfactory results from the studies on this matter.

<u>Necessary equipment for 12th grade</u>
Equipment procurement is the first priority of the project and almost all equipment has been already procured for the first 10 schools. For the second 10 schools, a procurement study continues and all the necessary equipment will be provided as much as possible.

Mr. ÇALIŞKAN, Principal of Izmir AML, pointed out that eight module textbooks for 12th grade of IAT departments have not been developed yet. These are related to the CIM laboratory and there are 22 teachers in expansion schools who received training on it. It will be more effective to assign some of these teachers to the module development.

Mr. ACIR, Director General, requested the expansion schools' principals to select some of their teachers for this duty and inform a related department of the GDTVE of their names.

H.2 2nd JCC Meeting in February 2009

Date: February 27, 2009
Venue: Sanliurfa Anatolian Technical High School
Participants: 40 (MoNE, SPO, Regional Representatives, TTC, Expansion Schools, Mid-term
               Review Team, JICA Turkey Office, and JPT)
Program:

1. Welcome Address

2. Opening Remarks • Mr. Huseyin ACIR, Director General, GDTVE, MoNE • Mr. Masato WATANABE, Team Leader, Japanese Mid-term Review Team, JICA • Provincial Directorate of Education • Chamber of Industry

3. Report on Project Activities Mr. Yücel YÜKSEL, Head of Department, GDTVE, MoNE

4. Presentations on an Outline and Results of the Mid-term Review Mid-term Review Team

5. Discussion

6. Presentation on Sustainability of the Project and JICA's Cooperation Mr. Yücel YÜKSEL, Head of Department, GDTVE, MoNE

7. Closing Remarks Mr. Huseyin ACIR, Director General, GDTVE, MoNE

The participants in the 2nd JCC meeting confirmed results from the Mid-term Review as well as progress and future schedule of the project.

The Mid-term Review was conducted from February 17 to March 7, 2009 to examine the progress and achievements of the project, identify issues and find desirable measures for the successful completion of the project, and confirm these among relevant organizations and parties. The review team concluded that the project had made a certain level of progress by efforts and strong eagerness of the stakeholders though there were a few issues to be resolved to achieve the project purpose.

The following table summarizes the conclusions and recommendations from the Mid-term Review.

Conclusions of the Mid-term Review
Positive factors
(1)   Strong commitment of the Turkish Government to IAT education and training.
(2)   Eagerness of the stakeholders.
(3)   Many beneficiaries widen their knowledge and perspective.
(4)   Most stakeholders are positive/optimistic/willing to the project.
(5)   Japanese experts are well respected by the counterparts (C/Ps).

(6)   C/Ps are highly motivated and well appreciated by trainees.

(7)   The TTC is highly expected to play an important role in IAT development in Turkey.

(8)   Many kinds of improvement are recognized in the progress of the project.

Factors to be improved

(1)   Unstable TTC position: budget, legal position, and independency.

(2)   Invisible future: TTC, trainers of TTC, and teacher training.

(3)   Whole picture of the teacher training courses is invisible for the expansion schools.

(4)   Positions of C/Ps and IAT teachers.

(5)   Incentive provided to C/Ps.

(6)   Current teacher training course structure needs further improvement.

(7)   Lack of budget for equipment of the TTC.

(8)   Delay of textbook development.

(9)   Delay of the course schedule (12th grade).

(10)   Insufficient information on the teacher training courses sent to the expansion schools in advance.

(11)   Budget: equipment, material for the lecture at the expansion schools.

(12)   Check and action parts of a PDCA cycle are week both in educational activities and project management.

Recommendations from the Mid-term Review

Action to be taken by the MoNE

(1)   Provide necessary budget urgently for the procurement of equipment at the TTC.

(2)   Amend a regulation of teacher assignment at the IAT departments.

(3)   Consider TTC's positioning.

(4)   Consider incentive for C/Ps.

Action to be taken by the project team

(1)   Improve the teacher training courses such as re-organizing a segmentation of a class and curriculum.

(2)   Hasten textbook and course development after the procurement of the necessary equipment.

(3)   Strengthen Check and Action parts of the PDCA cycle.

(4)   Inform the expansion schools in advance of attendance, curriculum and syllabus, annual schedule, etc.

Action to be taken with the joint initiative

(1)   Start considering how to keep sustainability after the project.

The study also recommended establishing a task force to stimulate communication and mutual understanding among the stakeholders for the successful completion of the project.

H.3   3rd JCC Meeting in April 2010

Date: April 14, 2010
Venue: MoNE, Ankara
Participants: 14 (MoNE, SPO, TTC, JICA Turkey Office, and JPT)
Program:

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1.   Report on Summary of Project Activities
Mr. Yücel YÜKSEL, Head of Department, GDTVE, MoNE

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2.   Presentations on the Teacher Training Center (TTC)
Mr. Satı ÇALIŞKAN, Principal, Izmir TML

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3.   Discussion

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4.   Report on Strategies and Future Activities
Mr. Murat ÖZDEVECİ, Chief of the IAT Department, Izmir TML

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5.   Report on Future Schedule of the Project
Mr. Takeshi SHIMOMURA, JPT

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6.   Closing Remarks
Mr. Yücel YÜKSEL, Head of Department, GDTVE, MoNE

The 3rd JCC meeting was held in the MoNE, Ankara and participants discussed challenges and future activities, considering the results and recommendations from the Terminal Evaluation Study conducted between February and March 2010.

__Summary of Project Activities__
Mr. YÜKSEL started the meeting by summarizing the project activities as follow:

- The JICA terminal evaluation mission came to Turkey from February 24 to March 10, 2010 and conducted surveys in Istanbul, Kocaeli, Ankara, Bursa, Antalya, and Izmir by questionnaire surveys and interviews with relevant people of the TTC and expansion schools as well as the related industries in these cities. At the end of the study, the mission reported that they evaluated the project activities as successful. The details in an evaluation report was discussed in a meeting that was held in Izmir on March 10, 2010.
- One of the issues, maybe the biggest one, which was faced during the project period, was permanent assignment of IAT department's teachers to the IAT field, and it was affecting motivation of the TTC lecturers negatively. In the meeting on March 10, the Director General announced that this issue was solved and official assignment papers were sent to the related teachers.
- SPREAD is a well known project by other General Directorates and departments of our Ministry. Same as the previous Minister of National Education, the new Minister also knows SPREAD well and gives all the possible supports. Lately, she approved 1 year-leave of a TTC counterpart, Mr. Egemen, for staying in Japan for his doctorate degree. This is also an indication of her positive approach to the project.
- Mr. Suat İYİGÜN, Section Manager of Training Materials and Equipment Department, is working like a member of the project team and supporting the TTC and the project

as much as he can, by sending required training materials and allocating budget for the procurement of training equipment at the TTC.
- Dr. Fatma BARKÇIN, expert at the Human Resources Development Department of GD of Social Sectors and Coordination at the SPO, has also involved from the previous project. She is acting like our representative in the SPO by giving all necessary support in the project implementation.
- All these supports are because of our successful activities altogether. On the other hand, a key point of this success is Japanese experts and Turkish counterparts, who are the main actors of SPREAD.

Mr. TAKADA, JICA Turkey Office, firstly stated that he agreed with all the topics, pointed out by Mr. YÜKSEL. Then, he added that there are 4-5 months left to complete SPREAD. Within this period, both sides should realize necessary actions to take the necessary measurements for the recommendations, given by the terminal evaluation study team.

Teacher Training Center
Mr. ÇALIŞKAN reported recent activities of the TTC.

- Participants in the teacher training courses would like to receive much higher technological training; mostly focusing on industry based subjects rather than students' education. But, since their background is not so high, they cannot get higher level training subjects.
- These participants are evaluating and criticizing the TTC and lecturers as well as Mazhar Zorlu's school management through questionnaire surveys conducted by the TTC lecturers. We also would like to criticize and evaluate the trainees. To do that, a database is planning to be prepared for each trainee, all the given training subjects, their success rate at the end of each course, and their general approach during the training. These data can be shared with their schools and the Ministry, which will be also very helpful for deciding further training courses for those teachers.
- Same teachers are sometimes sent to same courses two times, first for a mechatronics course and second for an industrial control course. However, same subjects are actually, given in both the courses. This situation must be resolved by the school principals and related section of the GDTVE.
    - Mr. YÜKSEL explained that this problem sometimes arose because there is not enough number of teachers in the IAT departments of the expansion schools. But, from June 2010, university graduates from mechatronics departments will be assigned to schools as IAT department's teachers and they will receive training at the TTC at the end of this year. This problem will be accordingly solved automatically.
- Trainees receive certificates at the end of the training courses. The TTC lecturers would like to learn if they can be also given certificates and these certificates can be accepted as an extra point for their promotional procedures in the future.
    - Mr. Osman Nuri ARIKAN stated that it is really an important topic and gets the In-Service-Training Department staffs feel uncomfortable. He said that the TTC lecturers should be motivated by providing certificates, since they are the key persons of effective TTC activities. Then he proposed to Mr. YÜKSEL to include this topic to a meeting agenda that will be held in the In-Service-Training Department on next Monday.
    - Ms. Leyla ORAL added that, based on the latest decision of the State Council, certificates are not accepted as the extra point for the promotional procedures of teachers.

- It was proposed to invite the IAT department chiefs to the next Project Progress Meeting together with their principals. Because the chiefs are the people who know actual problems faced during the implementation and management of the IAT departments.
  - Mr. YÜKSEL replied that 20 department chiefs and 20 principals will be very crowded altogether and it may cause accommodation problem at the site of the meeting. Another meeting can be organized with only the IAT department chiefs. This matter will be decided through further discussions in more details later.
- Related to the Azerbaijan training program and future training with other neighboring countries, it is considered to invite the president and relevant staff of TIKA to the TTC, which cause quite positive effect for relationship with TIKA.
  - Mr. YÜKSEL firstly gave some information on the next Azerbaijan training at the TTC.
    - ✓ First training was provided to technical teachers from Azerbaijan at the TTC in 2008.
    - ✓ Because of some budgetary problem, training in 2009 was postponed. Now, second training will be conducted from May 24 to June 18, 2010. The training schedule has already been sent to Azerbaijan. A participant list that was sent from Azerbaijan was requested to be revised because one of them already joined the first training.
    - ✓ Inviting TIKA's staff to the TTC is a good idea for showing them TTC's facilities and activities and making them understood the main concept of TTC's training in the IAT field.
  - Mr. TAKADA stated that "expanding TTC achievements to neighboring countries" is one of the recommendations from the terminal evaluation study team. Therefore, the JICA Turkey Office also would like to be invited to the TTC together with TIKA, if possible, during the Azerbaijan training for enhancing relations with TIKA.
- Many studies and visits are being realized within a concept of EU projects. Our school is now preparing a project with a title of "Teacher Training and Life-Long Learning" and will submit it to the National Agency that belongs to the SPO.
- The TTC intends to schedule short term summer seminars as package training courses. Any teacher who wants to get higher-level training can continue to participate in other levels of the package later on.
- We signed a protocol with Philip Morris Co. and Chamber of Mechanical Engineers in Izmir. The TTC lecturers accordingly started providing training for their technical staff. We also signed a protocol with SMC Company-Spain, which produces training sets on the automation field. Within a signed protocol's concept, SMC company-Spain will support the TTC by sending technicians or inviting the TTC lecturers to training in Spain for improving their specialty. On the other hand, the TTC will be one of training centers of SMC for giving training of SMC training sets.
- Under a frame of cooperation between JICA and SMC/Japan, SMC engineers will be asked to give training to Turkish teachers from Japan by a TV conference system. In Turkey, there are a total of 7 schools including the TTC that have smart class with the TV conference system. Now, we are studying on deciding required training subjects from SMC. Once the subjects are decided, we will apply to our General Directorate to get official approval and take the necessary official procedures.
- We also conduct joint studies with Manisa Organized Industry Zone, İzmir Atatürk Organized Industry Zone and Izmir Kemalpaşa Organized Industry Zone. Mr. NAGAI, one of the experts, is also working for another JICA project, in Ghana. If JICA approves, Ismir TML would like to invite Ghanaian technical teachers to training at the TTC. Another idea for supporting the Ghanaian project is to prepare some training sets by the TTC lecturers and send to Ghana, and TTC needs additional budget of total 20,000 TL

for this. We also an idea to send 2-3 TTC lecturers to Ghana for about 2 weeks to improve Ghanaian teaches' technical level. For realizing this idea, a budget of 4,500 Euro/person is necessary. Is it possible to get these budgets from TIKA?

- Mr. YÜKSEL stated that those topics need to be examined in details and will be replied later.

Comments and Discussion

Dr. Fatma BARKÇIN, SPO Expert, pointed out the following:

- The TTC was decided to be established through the previous JICA project with the efforts of the JICA experts and Mr. Yücel YÜKSEL to get the necessary official approvals. Then, the TTC's building was constructed within a short period of time.
- Now, we are honored to observe that the TTC is used for teacher training very actively. However, TTC's infrastructure needs to be improved to international standards as I pointed out at the final evaluation meeting. As the SPO, we will give necessary contribution to do this.
- I have been involved in many other international projects before SPREAD and observed that the most important point for a project is its sustainability. And we believe that this project will be sustainable through the great efforts and strong leadership of the principal of Izmir TML and lecturers of TTC.
- After the termination of the project, monitoring and follow-up studies will show us progress in the TTC activities. It is also important to follow IAT department graduates' employment situation. Within a framework of a World Bank project, "vocational guidance" will be combined with "e-graduate" in order to follow and evaluate the employment of graduates. IAT department graduates can be also involved in this follow up system.
- Finally, as an SPO expert, I am very happy to work with such a successful project team.

Mr. TAKADA stated the following points:

- The most important topic to be focused on is the monitoring system of the training courses. Before studying a third country training program (TCTP), the TTC needs to be focused on strengthening the existing monitoring system. First of all, target countries should be decided and then the details need to be discussed between JICA, TIKA and the TTC.
- The JICA Turkey Office will start to work on developing a policy for preparing a new project next month.
- On behalf of JICA, we would like to give our appreciation to the proposal of the TTC to support the Ghanaian project. Cooperation for African countries is a priority area of JICA HQ.

Mr. YÜKSEL added that TCTP is directly related with the Ministry of Foreign Affairs and it is necessary to be decided and approved the by them.

Mr. Ali BEKİN reminded that the next PPM will be conducted at the end of May 2010 and proposed to the MoNE to invite only the chiefs of the IAT departments of the 20 expansion schools, instead of the principals, since all the outputs of today's meeting has to be shared with them too.

After discussions on this matter for a while, another common idea has arisen to organize another meeting for only 20 IAT department chiefs, preferably in Izmir. That meeting should be

organized before the PPM, so that all issues and requests stated by the chiefs and other teachers can be conveyed to the PPM and discussed for getting effective solutions.

Mr. TAKADA suggested organizing the last JCC meeting that will be held in August in Izmir with a larger concept by inviting the Minister of National Education and Japan Ambassador. Further details can be discussed between the related authorities of the both sides later.

Mr. Suat İYİGÜN, Section Manager of Training Material and Equipment Department, expressed that they are very pleased to observe positive progress of this project from the first steps of the studies. Then, he added that his department tried to give all the needed support to the project on the related matters and will continue to support the expansion schools and TTC, even after the termination of SPREAD.

Recommendations from Terminal Evaluation & Strategy and Future Activities
Mr. ÖZDEVECİ pointed out the recommendations from the Terminal Evaluation Study as well as the strategy and future activities of TTC based on those recommendations.

- Related to a recommendation on "linkage with other organizations for the sustainability of the TTC", Mr. ÇALIŞKAN already explained the cooperation and signed official protocols between the TTC and local industrial companies and organizations as well as SMC Company in Spain.
- Two cooperative studies are being carried out by TKNIKA (Innovation Center for Training and Lifelong Learning) in Bask Region of Spain. One of them is an EU project which is coordinated by TKNIKA. Its aim is to combine all the training centers of other countries through a network. If this project is approved by the EU, the TTC will be a member of the network and always be in contact with all the other training centers in the world.
- For the other cooperation with TKNIKA, the studies are still going on to sign a protocol between the TTC and TKNIKA for carrying out joint project based studies as well as improving the lecturers' specialties of both sides by conducting exchange programs.

Future Schedule
Mr. SHIMOMURA explained expected schedules for further meetings and reports.

Acknowledgement and Closing
Mr. YÜKSEL summarized all the discussed topics during the meeting and stated that both sides will try to do their best to take necessary measurements. Then, he expressed his appreciation to all the related people of both sides.

H.4   4th JCC Meeting in August 2010

Date: August 2, 2010
Venue: Konya Chamber of Industry
Participants: 53 (MoNE, SPO, TTC, Provincial Representatives, JICA Turkey Office, and JPT)
Program:

1.   Welcome Address

2.   Opening Remarks
   • Mr. Halil ŞAHİN, Provincial National Education Director
   • Mr. Hiroyuki TAKADA, Senior Representative, JICA Turkey Office
   • Mr. Hüsamettin KAYA, Deputy Director, GDTVE, MoNE

3.   Speeches by Graduates from Konya Adil Karaağaç School

4.   Presentations on Project Activities Mr. Yücel YÜKSEL, Head of Department, GDTVE, MoNE

5.   Presentation on Future Activities Dr. Hideo NAKAMURA, Chief Advisor, JPT

6.   Presentation on the Teacher Training Center (TTC) Mr. Satı ÇALIŞKAN, Principal, Izmir TML

7.   Discussion

8.   Closing Remarks

The 4th JCC meeting was held in Konya on August 2, 2010. Various actual outcomes from the project were reported at the meeting and confirmed among the participants. It was also mentioned and affirmed that the TTC is the first and unique model in Turkey and will continue and expand teacher training and other various activities even after the project.

Welcome Address
Mr. Hasan Hüseyin SÜRÜCÜ, Principal of Konya Adil Karaağaç Technical and Industry Vocational High School, welcomed all the participants and presented a meeting program. Then he completed his words by wishing a fruitful meeting.

Opening Remarks

Mr. Halil ŞAHİN, Provincial National Education Director, described the following points in his speech.

- A name of the project and topic of the meeting are really very impressive, since "industrial automation technologies" and "teacher training" are the fields that are completely matching with the development in the world. It is also great happiness to know that Konya Adil Karaağaç School is involved in this important project. But, there is no doubt that it is because of the success of the school and big importance given by

Konya industry to technical and vocational education.

- Globalization is making the world smaller and also increasing international competition. The only way of coping with the competition is to catch up the highest quality in most economical method, which is possible only with well-trained technical human power.
- As Provincial National Education Directorate, we think that we should meet the expectations of Konya and Turkey industry. Within this concept, we are always in contact with our vocational high schools and higher education institutions as well as other civilian organizations.
- We are always trying to have successful studies as a model for us. In 2000, an official agreement of a project was signed between the Turkish and Japanese Governments and Konya school was involved into this important project. From that time, we, as the educational management side, are trying to give our best effort for supporting the project activities as well as meeting needs of industry side.
- I wish today's meeting will be very beneficial with fruitful outcomes for the educational and industrial sides. And I give my appreciation to the JICA representatives, MoNE authorities and all the other related people of the project.

Mr. Hiroyuki TAKADA, Senior Representative of the JICA Turkey Office, made a speech as follows.

- On behalf of JICA, I would like to say that it is great honor for me to give few words to you about SPREAD. As JICA, we are trying to support Turkish human resource development, particularly technical and vocational human resources, through technical project activities for more than 35 years. SPREAD is the last model of that kind of technical cooperation with Turkey, and we are almost in the final stage of the project.
- In March 2010, the Terminal Evaluation Study Team shared all the evaluation results with the MoNE and SPO. And both sides agreed on the points, which need to be improved until the termination and which need to be completed after the project.
- As JICA, we wish this JCC meeting would be fruitful for achieved improvements and future activities of the project. I also hope, today's meeting will provide us with a good atmosphere for the sustainability that is the most important matter towards the termination of the project.

Mr. Hüsamettin KAYA, Deputy Director General of GDTVE, stated the following in his speech.

- We are very happy to be together with the Japanese and Turkish authorities in such an industrial developed city. As all of us know, we started the previous project in two pilot schools in 2001 and then expanded to 20 more cities all over the country. Now, we are coming to the termination of the project. In this instance, the most important questions to be replied are:
    - What was our target in these projects?
    - Did we achieve our target?
- We have determined as the MoNE that the IAT field is the most successful application field among a total of 52 fields all over the country. And we know that the most important factor in that success is firstly support from JICA and then that from industry.
- At the end of the project, rates of graduates who continue to higher education and get employment at the industry, and also positive comments from the industry side on our graduates' quality are all very satisfactory points for us.
- The MoNE is receiving many requests from other provinces for opening new IAT fields. But, it is known that total cost of opening an IAT field at a school is very high because of very expensive equipment. So, in order not to decrease the quality of this field, we have stopped opening new IAT fields all over the country.

- The MoNE is organizing nation-wide robot contest in cooperation with the JICA Turkey Office every year. We organized the 4th one this year, which was much more enthusiastic rather than previous years because the year 2010 was Japan Year in Turkey. For this reason, we accepted participants not only from technical and vocational high schools and universities but also from the Institute of National Colleges of Technology, Japan (INCT). By expanding the IAT Fields over the country, the participation in the contest from the IAT was much more this year and IAT field students were awarded many prizes in different categories. We believe that this kind of events encourages students to do their best, and therefore we think that we are on the right way.
- I hope results of today's meeting provide large contribution to the technical and vocational education of our country.

Presentation on Project Activities

Mr. Yücel YÜKSEL, Head of Department of the GDTVE reported achievements from the project activities.

- First of all, I would like to express my happiness and excitement for obtaining successful results of our projects that was firstly started 10 years ago. The previous project was implemented in two pilot schools in Izmir and in Konya between 2001 and 2006 and terminated successfully. Then it was decided to expand to 20 more cities all over the country.
- In 2007, the project named as SPREAD started in the Teacher Training Center (TTC) of Izmir TML with a main purpose of "establishment of a teacher training system at the TTC". I personally know how it was difficult to implement like this project. Mr. Satı ÇALIŞKAN, principal of Izmir TML, also knows how difficult it was to cope with issues that are faced during different stages of project implementation. He successfully managed the project activities. We know that he always tried to overcome the issues, especially financial one, by himself. On behalf of the General Directorate and also personally, I would like to give him our appreciation for his high-performance working life. Although he was already retired in the end of July 2010, he accepted to join this meeting and make his presentation as the principal of Izmir TML. We also give our thanks for that.
- Expansion schools' principals and IAT departments' chiefs and teachers share in the success of the project too. On the other hand, we have to give our appreciation to Educational Tools and Equipment Department Management, General Directorate of Personnel Affairs, Board of Education and of course State Planning Organization for their permanent support. The JICA Turkey Office continuously supported the Turkish side for achieving the project targets. Japanese experts, who were dispatched to a project site (Izmir) for certain periods, always worked for the project activities devotedly. So, as the Turkish side, we give them our highest gratitude for their contribution.
- Through all the training courses that were conducted under the concept of the project, a total of 319 teachers in the IAT field received the training. On the other hand, a total of 967 teachers from other related fields received training in Konya and in İzmir.
- Equipment provision of the TTC is highly completed. The equipment and materials of expansion schools' laboratories are almost provided with the local procurement in each.
- The most important outcome from SPREAD is the establishment of a teacher training system at the TTC.
- I would like to give some information about two other projects on technical and vocational education.
    - One of them is MEGEP.
        - ✓ Educational system was re-structured as a modular system.
        - ✓ Needs of teachers were defined.

  ✓ In-service-training courses will be started based on those needs from 2011.
  - The other project is UMEM (Specialized Job Providing Centers).
    ✓ Unemployed people will receive training for obtaining hobs.
    ✓ A total of technical and vocational high schools were selected as training centers of this project all over Turkey.
    ✓ Those schools will be analyzed on which school can give which field's training.
    ✓ Equipment needs of those schools will be determined.
    ✓ New textbooks will be prepared for those training.
    ✓ Teachers of those schools will receive training more specifically and their training programs are planned to be started in August 2010.
- Now, I would like to present what we did and what we will do for the sustainability of SPREAD that is the most important criteria for the successful evaluation of the project.
  - Equipment and material provision of the TTC laboratories were completed.
  - The TTC will be kept as an attachment institution, officially belonging to Izmir TML.
  - Depending on the current legislation, it is impossible to assign teachers as TTC's permanent staff. However their temporary assignment of the TTC lecturers will be secured even after the termination.
  - The TTC continues training not only for the expansion schools' teachers but also other related fields' teachers as well as technical staff of industrial companies. In this concept, the cooperation with the Aegean Region Chamber of Industry and Chamber of Mechanical Engineers in Izmir is still going on.
  - Studies for giving training to other countries' technical teachers continue. Only Azerbaijani teachers received training at the TTC two times until now. From now on, other neighboring countries will be included into this program.
  - The TTC will give technical information and service to other schools and industry on IAT field.
  - The TTC will support the development of regional industry.
  - The technical qualification of the TTC lecturers will be improved to a level that is enough to be able to provide technological consultancy for industrial companies.
  - Close cooperation will be kept with universities.
  - Many workshops and meetings will be organized at the TTC on different vocational topics.
  - The TTC will be a technology center for the IAT field and teachers of other projects will receive training by the TTC lecturers.
  - Distance training will be conducted through video conference system that is available at the TTC.
  - Training courses for unemployed people continue at the TTC.
  - All these activities are summarized in the Long-term Strategy of the Teacher Training Center that is important for both the Turkish and Japanese sides on the future position of the TTC after the termination of the project.

Speeches by Graduates from Konya Adil Karaağaç School
Mr. YÜKSEL stated that some graduates from Konya Adil Karaağaç School are here as observers of today's meeting. Then he requested them to give a few words to the participants, explaining their school life and their way after graduation.

Mr. Selman TAŞAR
- First of all, I would like to give my deepest appreciation to everybody who gave effort for our education.

- I can say that I was always feeling the difference of being a student at the IAT department because we were always one step ahead of students from other departments. And I believe that we have proved that difference with our success at contests that we competed with students from other departments and universities.
- I graduated from the Mechatronics Teacher Faculty of Marmara University. This year. When I started my university education 4 years ago, I felt difference compared to other students who had different backgrounds from the first day. I was again one step ahead of them. I understood how big opportunities and high-quality education we received at our high school because there were not same equipment and opportunities at my university.
- I am now a university graduate and carrying heavy responsibility of being a teacher in near future. Because, I will continue a way of my teachers and educate new generations in the IAT field. Thank you very much for giving me such a chance for expressing my feelings to you.

Mr. Hasan VERİNÇ
- I graduated from the IAT department of Konya Adil Karaağaç High School 4 years ago and directly launched out into working life. Now, I am working at Bilim Pharmaceuticals Company. First, I started to work as a technician and now as a control systems' team leader. From the first day of my working life, I have felt the difference and importance of my education at my high school.
- We are now conducting a project and have a chance to work with many people from 9 different countries. Area of the project is most modern automated warehouse systems without man-power. Except this project, there are two other projects and we are really having big role in these projects as a team.
- We here two persons, coming from Adil Karaağaç High School and working in my team. And the most frequent question, coming from my managers, is when new graduates from Konya Adil Karaağaç School are going to be graduated and involved into business life.
- As graduates from the IAT department of Konya Adil Karaağaç, we are in sense of our responsibilities and try to represent our school successfully with support of our teachers and also our close contacts with the industry side.

Mr. KAYA expressed that he was very happy to hear these words from the graduates, since they are very good examples both of university education and working at industry after graduation.

Presentation on Future Activities
Dr. Hideo NAKAMURA, Chief Advisor of JPT, reported future activities in his presentation. He mainly explained a chart showing relations between the TTC and other related organizations and subsequently stated that future activities will be focused on teachers and industry not only in Turkey but also in foreign countries. Then he emphasized three main activities of the TTC:

- Development of human resource for teachers and industry;
- Being an information and technology center for schools and industry; and
- Accumulation of the latest technology for the IAT field and assist the two activities mentioned above.

Presentation on the Teacher Training Center (TTC)
Mr. Satı ÇALIŞKAN, Principal of Izmir TML made a presentation on activities of the TTC and stated the following topics.

- The official agreement of the project for establishing the IAT departments in Izmir and in Konya was signed in 2000. We now completed almost 10-year project activities;

mainly established the IAT departments in the two pilot schools through the previous project, decided to expand the IAT departments to all over country, constructed the TTC for training expansion schools' teachers, and established the TTC teacher training system through SPREAD.

- I am now very happy to inform you that we have almost arrived to the same level of technical qualification as the industry in this field. Even industrial enterprises started to apply to the TTC to provide training for their technicians and engineers.

- I did not intend to get retired before completing the project and now we have very short time to complete the project. But a regulation was approved by the MoNE, and all the principals who completed 5 years in schools will be assigned to other schools as principals and a deadline of application for new schools was the end of July. I decided not to apply for a new school and get retired.

- The most important matter for me is to having implemented all the activities at my school and TTC without any interruption. Therefore, if I leave now, a new principal will be able to keep going on.

- My plan is to continue my working life as an active member of the Mazhar Zorlu Foundation and support the school and TTC, if needed. I would like to give my appreciation to all my Japanese colleagues during 10 years for their great efforts for the project activities and also for their hospitality in Japan. I also would like to give my appreciation to all the expansion schools' principals, their teachers and all my teachers for their great efforts and for their friendship as well.

After Mr. ÇALIŞKAN's presentation, Mr. KAYA gave a few words.

- On behalf of the General Directorate, I would like to give our appreciation to Mr. ÇALIŞKAN for his great performance during 10 year-project at Izmir TML and TTC. Additionally, I am very happy to hear that he will keep working for the Mazhar Zorlu Foundation.

- Additionally, I am very happy to hear that he will keep working for the Mazhar Zorlu Foundation.

- A name of the person in charge of a duty always changes from time to time. The most important point is that a new person newly being assigned to a duty should try to take the success rate to much higher levels. Within that frame, we believe that new principals who will be assigned to schools their will perform their duty with this understanding.

- Finally, we would like to give our appreciation to all the principals for their great effort for the project.

Discussion
A workshop was held on the same date of the JCC meeting and the following comments and discussions were made for both the JCC meeting and workshop.

Mr. Sami ÖNAL, Section Director of the Board of Education
- We have known the projects since 2000 though we had not been directly involved in. The outcomes of the project absolutely meet with our primary target: providing high-quality education.

- The Board of Education is an institution, trying to make overall educational system a good quality and effective model. Therefore we always support this project and wish that this kind of projects bring many innovations to our educational system.

- The TTC is a very different training center from other existing in-service-training centers located in different cities of Turkey and providing training with a target of multifunctionality. Therefore the current regulation should be revised for more benefits of the TTC.

- We know that the TTC have many duties, including providing training courses for industrial sectors. But, we believe that each expansion school can have a capacity to serve as such a training center too. Therefore the expansion schools should improve their training ability and conduct training courses for the industrial sectors. They should also establish strong cooperation with universities.
- As the most important matter to be considered, the TTC lecturers might need to receive some training for updating their knowledge and skills. The TTC should cooperate with universities as well because universities are quite developed technologically in recent years.
- TTC's most important duty should be the development of training program. They have to develop modular training programs. So, the people who have different training needs can be provided the most suitable module of training programs.

Mr. İzzet FAKILI, Section Director, General Directorate of Personnel
- As the General Directorate of Personnel, our main duty is to assign most appropriate personnel to projects or other kind of duties. In that sense, we allocated additional number of personnel cadres to the project implemented at Izmir TML. We also realized permanent assignment of teachers who received training at the TTC to the IAT departments.
- We will keep giving our support whenever needed for more effective implementation of TTC's activities and educational activities of the IAT field.

Mr. Suat İYİGÜN, Section Director, Department of Educational Tools and Equipment
- The difference on procured equipment between the TTC and expansion schools have been revived again. So it is better to explain once more how the official procurement process worked for this project.
- A commission, consisting 8 technical teachers, who were experienced the development of mechatronics programs, were sent to universities for searching mechatronics equipment. After completing the studies, they prepared technical specifications of necessary equipment. The specifications were sent to companies and then finalized. After that, tenders of companies were invited for bids and procurement was done based on its results.
- If we would have a chance to open the IAT departments at the 20 expansion schools at the same time, all the schools could have the same brand equipment. But, since we separated the schools to 2 groups, we had to differently procure two times. The first group 10 expansion schools have a FESTO CIM Laboratory and second group 10 expansion schools will probably procure a FESTO or SMC. But the important point here is not a name of brand, but to understand basic knowledge and its application.
- Some points were stated about insufficiency of TTC accommodation. Since I am involved in the TTC from the beginning of its construction, I can say that the accommodation conditions of rooms are quite sufficient. Only kitchen is missing at the TTC. A necessary study will be done for that and the kitchen will be brought to the TTC as soon as possible.
- We already allocated total 200,000 TL for the second group 10 expansion schools for the equipment procurement. As they will decide which brand to buy, those 10 schools should discuss and come to a common decision in order to have a standard equipment at their laboratories.

Ms. Fatma BARKÇIN, Expert of SPO
- I have been involved in many different projects. But since I have been involved in this project from its beginning, almost 10 years ago, I am now very honoured to see the fruitful outcomes at the final stage.

- This project, terminating next month, provided many experience to all the related people. The most important point after the termination should be to continue the activities using those experience with our own resources and efforts. Monitoring and evaluation questionnaire surveys for trainees and lecturers should be seriously taken into considerations.
- New graduates from the mechatronics faculties of the universities should join orientation courses at the TTC.
- A survey team should be built for searching the latest teaching methods and techniques. If the TTC lecturers brush up themselves with newest teaching methods, it will directly affect the development of the country through more quality teacher training.
- As I expressed in previous meetings of this project, the follow-up system for graduates of this field is very essential for further improvements.
- Izmir TML has much bigger responsibilities rather than the other expansion schools. All the criticisms and complaints about the teacher training are being conveyed to the TTC lecturers. But it is fairly sure that a smooth operation of the training courses needs a well-established training system. And establishment of the system needs a long-term study together with support of related higher authorities.
- I would like to give my appreciation to the principal first of all, then the TTC lecturers and Japanese experts for their enormous efforts.

Mr. Satı ÇALIŞKAN, Principal, Izmir TML
- Although we have already shared all those comments and suggestions about teacher training courses with expansion schools' teachers at the TTC during their training, we had one more chance to hear from them. We have recorded all the points stated by the expansion schools. All of them will be seriously taken into consideration for the further activities.
- We prepared an equipment list in March and sent to the MoNE. Its total amount was 1,250,000 TL. Then our General Directorate could allocate an amount of 850,000 TL in financial year of 2009. So equipment procurement was mostly completed.
- Practical training programs started to provide for teachers with newly procured equipment. It has directly increased their satisfaction.
- All the module textbooks and teacher training textbooks were completed.
- For provision of other necessary furniture and kitchen equipment, we already sent a list to the General Directorate. We are now waiting for their necessary action.
- Our only expectation for the General Directorate is the completion of remained missing equipment at the TTC.

Closing Remarks

Mr. TAKADA, Senior Representative of the JICA Turkey Office made closing remark.

- I initially express my sincere gratitude, on behalf of the JICA Turkey Office, to everybody who made contribution for the implementation of this project.
- As can be understood from the recommendations, the project attained positive results.
- It is also verbally underlined by the graduates that the education level of the IAT Departments is high and their contribution to the industry is higher than that of university.
- Even though there are still challenges, sustainability of the outcomes from teacher to teacher, from school to school, and from country to country is crucial from JICA's point of view.

- Our experiences at the TTC showed that technological infrastructure is not solely important for success, but ways/methods of teaching are also the important part of the project.

Mr. KAYA, Deputy General Director, also make closing remark.

- IAT is a new field, consisting of four sub-fields: electricity, electronics, computer and mechanics. Of course, as the new field, we felt many difficulties in finding appropriate quality of teachers to be trained, establishment of infrastructure and following the technology. But, in spite of all those difficulties, it is clear that this project put a distinct mark on the history of technical and vocational education.
- The other ordinary in-service-training centers have an independent management with an independent budget allocation. So that, the accommodation and other service conditions are better than the TTC. But the TTC is an attached institution under Izmir TML with no separate budget. All its expenditures are charged from school budget. It means that the TTC is still being tried to keep alive by overcoming many legislative difficulties.
- This project is given quite big importance by our General Directorate. Namely; there are total 36 fields with total 680,000 students under our General Directorate. On the other hand, the total number of IAT field's students is only 2,000 to 3,000. If we compare their budget allocated to the IAT field and all other fields, it can be understood that the major part of other fields' budgets are transposed to the IAT field. It clearly shows the importance of the IAT field.
- Minor problems can be overcome easily. Even if the project will be officially terminated next month, it is going to be sustained after the termination too.
- We are now working on another project on establishment of "centers of excellence". We will select 36 schools and will make each of them a center of excellence for a field. It means that there will be a total of 36 centers of excellence in 36 different fields all over the country. And the TTC will be the center of excellence for the IAT field, of course.
- Our main aim is to expand teacher training, adult training, unemployed training, life-long learning, etc., to all over Turkey. By using all the experience, acquired from this project implemented at the TTC, we will try to carry technical and vocational education to much better levels with other projects.

Appendix I   Actual Inputs into the Project

I.1   Experts of the JICA Project Team (JPT)

The Project was implemented by the MoNE and TTC in partnership with the JPT that consists of the experts from PADECO Co., Ltd. and the Institute of National Colleges of Technology, Japan (INCT) commissioned by JICA. Names, positions, and assignment duration of the experts are shown in Table I.1. Various activities were conducted, receiving assistance from Ms. Neslihan Bildir, Ms. Sachi Kono, and other relevant organizations and persons.

Table I.1 Experts of the JICA Project Team (JPT)

(Person-Month)

Name and Position	Duration of Assignment			
	1st Phase	2nd Phase	3rd Phase	Total
Dr. Hideo Nakamura	3.83	3.00	5.30	12.13
Chief Advisor/Center Management	(0.20)	(0.20)	(0.17)	(0.57)
Mr. Yoshinori Shirakawa	5.17			5.17
Training Management	(0.20)			(0.20)
Ms. Kumiko Ara	2.40			2.40
Teacher Training Management				
Mr. Tamon Nagai		8.43	7.00	15.43
Training Management/Task Force Management		(0.20)	(0.13)	(0.33)
Ms. Tomoko Maeda		2.60	1.33	3.93
Training Management		(0.20)	(0.03)	(0.23)
Mr. Takeshi Shimomura			10.40	10.40
Training Management/			(0.13)	(0.13)
Industry-Government-Academia Partnership				
Dr. Yoshio Sorimachi	4.73			4.73
PLC	(0.10)			(0.10)
Dr. Masatoshi Tokita		3.97	3.63	7.60
PLC		(0.10)	(0.03)	(0.13)
Dr. Hidekazu Kajiwara		4.17		4.17
PLC		(0.10)		(0.10)
Dr. Yosuke Asano			3.67	3.67
PLC			(0.03)	(0.03)
Dr. Hisashi Ito			2.20	2.20
PLC			(0.03)	(0.03)
Mr. Masaki Naito	4.73			4.73
Electricity/Electronics	(0.20)			(0.20)
Dr. Ray Nakashima		8.13		8.13
Electricity/Electronics		(0.10)		(0.10)
Dr. Osamu Okamoto			3.37	3.37
Electricity/Electronics			(0.03)	(0.03)
Dr. Keitaro Hori			4.30	4.30
Electricity/Electronics			(0.03)	(0.03)
Dr. Kenichi Iida			1.50	1.50
Electricity/Electronics			(0.03)	(0.03)
Mr. Keiichi Sato	2.87			2.87
Computer Network	(0.10)			(0.10)
Dr. Yozo Takizawa		2.00		2.00
Computer Network		(0.10)		(0.10)
Dr. Hisayuki Sasaoka			2.00	2.00
Computer Network			(0.07)	(0.07)
Dr. Takumi Nakano			1.50	1.50
Computer Network			(0.03)	(0.03)

Name and Position	Duration of Assignment			
	1st Phase	2nd Phase	3rd Phase	Total
Dr. Jiro Shimonishi Automatic Control	2.13 (0.10)			2.13 (0.10)
Dr. Tadateru Ishide Machinery		(0.33)		(0.33)
Dr. Takaharu Kuroda Factory Automation System		(0.33)		(0.33)
Mr. Kunihito Usui Control System		(0.33)		(0.33)
Total	25.86 (0.90)	32.30 (1.99)	46.20 (0.76)	104.36 (3.65)

Parenthetic figures indicate duration of home assignment.
The total duration of assignment does not necessarily correspond with the sum of each expert's figure due to round-off.
Source: JICA Project Team

I.2   Equipment and Books Purchased by JICA for the Project Activities

Table I.2 and Table I.3 show the equipment and books purchased by JICA for the project activities. These equipment and books were transferred to the MoNE and TTC at the end of the Project to continue activities.

Table I.2 Equipment Purchased for the Project Activities

Equipment	Specification	Quantity	Year Purchased
Desktop PC	HP M8150	2	2007
Laptop PC	TOSHIBA A200	3	2007
PC Software	Adobe Acrobat	1	2007
PC Devices	Extension codes, transformer, etc.	1 set	2007
Printer (Color)	HP 2600N	1	2007
Printer (B/W)	HP 1018	1	2007
Copier	MITA MC1116	1	2007
Cellular Phone	Nokia 1110i	4	2007
PLC	Siemens	2 set	2008
Experiment Parts	Tamiya and others	1 set	2008
Servo Motor and Control Unit	Omron	1 set	2009
CIM Lab	FMS 202 Bearing selection set	1 set	2009
Flow Meter	Horiba DU-5tGS	1 set	2009
Flow Meter Display	Horiba LM102AT. AR	1 set	2009
Electro hydro set	SMC	1 set	2009
USB Cable for Embedded System	ARM-USB-OCD	1 set	2009
Device Net Interface Unit	Omron DRM 21/CLT1-DR7	1 set	2009
Server	HP DL160G6 Quad-Core Xeon 5504 2.00 GHz 4MB L3 4GB 1P Rack Server	1 set	2010

Source: JICA Project Team

Table I.3 Books Purchased for the Project Activities

Title	Publisher	Year of Publication
Robot Building for Beginners	APRESS	2002
Intermediate Building	APRESS	2004
Controlling with SIMATIC	PUBLICIS CORPORATE PUBLISHING	2005
Stepping Motors and Their Microprocessor Control	CLARENDON PRESS - OXFORD	2003
Securing SCADA Systems	WILEY PUBLISHING, Inc.	2005
Workbook for Machine Tool Practices	PRENTICE HALL	2006
Programmable Logic Controllers / Fourth Edition	ELSEVIER / NEWNESS	2006
Absolute Beginner's Guide to Home Automation	QUE PUBLISHING	2005
Mechanical Movements	DOVER PUBLICATIONS	2005
Workbook for Machine Tools	McGRAW-HILL	2005
Mechanisms and Mechanical Devices	McGRAW-HILL	2007
Embedded C Programming	ELECTRONIC PRODUCTS	2008
Interfacing PIC Microcontrollers	ELSEVIER / NEWNES	2006
Robot Modeling and Kinematics	DA VINCI ENGINEERING PRESS	2006
Electric Motors and Control Techniques	TAB PRODUCTS	1994
Intelligent Sensor Design	NEWNES	2007
Creating Human Machine Interfaces Using Visual Basic	INDUSTRIALVB	2000
Technology of Machine Tools	McGRAW-HILL	2005
Machine Devices and Components	McGRAW-HILL	2005
Modern Controlling Engineering	PRENTICE HALL	2002
Advanced Microcontroller Projects in C	NEWNES	2008
Digital Control Systems	SPRINGER	2006
Measurement Systems and Sensors	ARTECH HOUSE, Inc.	2005
Manufacturing Execution System - MES	SPRINGER	2007
PLC Programming for Industrial Automation	EXPOSURE PUBLISHING	2007
Automating Science Engineering Laboratories with Visual Basic	JOHN WILEY & SONS, Inc.	1999
Electronic Motors and Drives	NEWNES	2006
Creating HMI / SCADA Industrial Applications Using Microsoft Access	INDUSTRIALVB	1999
Visual C++ 2008	WILEY PUBLISHING, Inc.	2008
Visual C++ 2005	WILEY PUBLISHING, Inc.	2006
Visual C#2008	WILEY PUBLISHING, Inc.	2008
USB Mass Storage	LAKEVIEW RESEARCH lnc.	2006
Computer Interfacing Via the Parallel port with Visual Basic Programming	AUSTRALIAN SCHOLARLY PUBLISHING PTY. Ltd.	2005
Developing Web Applications with Visual Basic.Net and ASP.NET	WILEY COMPUTER PUBLISHING	2002
Ingenious Mechanisms for Designers and Inventors /Volume 1	INDUSTRIAL PRESS Inc.	1930
Ingenious Mechanisms for Designers and Inventors /Volume 2	INDUSTRIAL PRESS Inc.	1936
Ingenious Mechanisms for Designers and Inventors /Volume 3	INDUSTRIAL PRESS Inc.	1951
Ingenious Mechanisms for Designers and Inventors /Volume 4	INDUSTRIAL PRESS Inc.	1967
Microsoft Visual C++	PACKT PUBLISHING	2008
Programlanabilir Kontrolörler	BİLEŞİM YAYINEVİ	2003

Title	Publisher	Year of Publication
Endüstriye Dönük Uygulamalı Radyo Mühendisliği ve Telemetri	BİLEŞİM YAYINEVİ	2003
Robotik Mekatronik ve Yapay Zeka	BİLEŞİM YAYINEVİ	2003
Gömülü Sistemlerde TCP / IP ve Internet Üzerinden Kontrol	BİLEŞİM YAYINEVİ	2003
Gömülü Mikroişlemcilerle Analog Arayüz Kurma	BİLEŞİM YAYINEVİ	2001
ERP Kurumsal kaynak Planlaması	BİLEŞİM YAYINEVİ	2003
Elektrik Şebeke Otımasyonu ve İletim Sistemleri	BİLEŞİM YAYINEVİ	2003
Enstrümantasyon ve Kontrol Sistemleri ve very Edinimi	BİLEŞİM YAYINEVİ	2003
SCADA for Industry	BİLEŞİM YAYINEVİ	2003
TCP / IP ve Eternet Ağları	BİLEŞİM YAYINEVİ	2003
Gömülü Sistemlerde Bulanık Mantık	BİLEŞİM YAYINEVİ	2004
Analog ve Dijital Filtre Tasarımı	BİLEŞİM YAYINEVİ	2005
İmalat Sektöründe Proses Planlama	MAKİNA MÜHENDİSLERİ ODASI / BİLEŞİM YAYINCILIK	2008
Microsoft Visual Studio.NET'I Kavramak	ARKADAŞ YAYINEVİ	2004
A'dan Z'ye MATLAB ile Çalışmak	BİLEŞİM YAYINEVİ	2004
Net ve Mobil Teknolojileri	SEÇKİN YAYINCILIK	2007
PIC ve PC İletişim Projeleri	BİLEŞİM YAYINEVİ	2004
Automatisieren mit SIMATIC	PUBLICIS PUBLISHING	2010
Mitsubishi FX Programmable Logic Controllers	ELSEVIER	2004
Automas Programables y Sistemas de Automatizacion	MARCOMBO EDICIONES	2009
Control Electroneumatico y Electronico	MARCOMBO EDICIONES	1997
Como y Cuando Aplicar un Robot Industrial	MARCOMBO EDICIONES	1988
Automatizacion Neumatica y Electroneumatica	MARCOMBO EDICIONES	1995
Potencia Hidraulica Controlada por PLC	RA – MA	2008
Fundamentos de Robotica	McGRAW-HILL	2007
Automas Programbles Enterno Aplicaciones	THOMSON PARANINFO	2004
Programacion de Automatas Industriales OMRON	MARCOMBO EDICIONES	1995
Programacion de Automatas Omron Sysmac com1/com1h	CANO-PINA, S.L. – EDICIONES CEYSA	2006
Comuncaciones Industriales	MARCOMBO EDICIONES	2009
Sistemas SCADA	MARCOMBO EDICIONES	2006
Sistemas SCADA Guia Practica	MARCOMBO EDICIONES	2007
STEP7 Una Manera Facil de Programar PLC de Siemens	MARCOMBO EDICIONES	2009
WinCC Flexible ile Operatör Panel ve SCADA Programlama	CELİSA TANITIM ve REKLAM HİZMETLERİ Tic. Ltd. Şti.	2010
Mekatronik	DAHİ YAYINLARI	2009
PLC Programlama ile S7 - 300	EGE REKLAM BASIM SANATLARI Ltd. Şti.	2008
STEP7 ile S7300, S7400 PLC Programlama	CELİSA TANITIM ve REKLAM HİZMETLERİ Tic. Ltd. Şti.	2005
Using Moodle: Teaching with the Popular Open Source Course	O'REILLY MEDIA Inc.	2007
Moodle 1.9 E-Learning Course development: A Complete Guide to Successful Learning Using Moodle 1.9	PACKT PUBLISHING	2008
Moodle Administration: An administrator's guide to configuring, securing, customizing and extending Moodle	PACKT PUBLISHING	2008

Title	Publisher	Year of Publication
Moodle teaching Techniques: Creative ways to use Moodle for constructing online learning solutions	PACKT PUBLISHING	2007
Moodle 1.9 Multimedia [Paperback]	PACKT PUBLISHING	2009
Moodle 1.9 Extension Development [Paperback]	PACKT PUBLISHING LIMITED	2010
Moodle 1.9 for Design and Technology [Paperback]	PACKT PUBLISHING LIMITED	2010
Moodle 1.9 Theme Design: beginner's Guide [Paperback]	PACKT PUBLISHING LIMITED	2010
Measurement and Control Experiment with Visual Basic	C-TASK Co., Ltd.	2002
First-time PC Practical Work with Visual Basic	CQ Publishing Co., Ltd.	2002
Introduction to Measurement and Control Experiment with USB	C-TASK Co., Ltd.	2007
Design of USB 2.0 Interface	Denpa Publishing	2008
Application Guidebook of dsPIC for Electronic Control and Signal Processing	Gijutsu-Hyohron Co., Ltd.	2006
Open CV Programming Book	Mainichi Communications Ink.	2007

Source: JICA Project Team

I.3   Project Cost Contributed by JICA for the Project Activities

Table I.4 shows the project cost in each phase and total amount that JICA directly contributed to the Project. The cost of the third phase is an estimated amount as of August 2010.

Table I.4 Project Cost Contributed by JICA

Phase	Amount (Thousand JPY/Thousand TRL)
First Phase	90,669 (1,619)
Second Phase	118,333 (2,112)
Third Phase	159,549 (2,848)
Total Amount	368,551 (6,579)

Parenthetic figures indicate each equivalent amount in Turkish Lira (TRL) converted by an exchange rate as of August 24, 2010: 1 TRL = 56.02 Japanese Yen (JPY).
Source: JICA Project Team