

Country Name	<b>Industrial Automation Technology (IAT) Extension Project for Central Asian/Middle East Countries</b>
Republic of Turkey	

**I. Project Outline**

Background	<p>In Turkey, with rapid expansion of manufacturing industries in the 1990s, it was an urgent issue to fulfill the quantitative and qualitative needs of technical human resources in the manufacturing sector, especially of the mid-level technicians. Under the circumstances, JICA supported the Ministry of National Education (MoNE) through implementation of technical cooperation projects titled “Establishment of Industrial Automation Technologies Departments in Anatolian Technical High Schools” (2001–2006) and “Project on Strengthening the Program of Expanding Industrial Automation Technologies Department (SPREAD)” (2007–2010). Following those successful initiatives, MoNE and JICA planned to transfer the knowledge and experience acquired through the above-mentioned projects to vocational and technical teachers of the countries in Central Asia and the Middle East.</p>												
Objectives of the Project	<p>Through appropriate planning and effective provision of training for the target group as well as establishment of the follow-up system of the training, the project aimed to enhance the capacity of teachers for vocational and technical training on IAT in the target countries*, thereby contributing to the enhancement of such capacity of these countries.</p> <p>*Target countries:  1) Country Focused Training (CFT): Azerbaijan, Kazakhstan, Pakistan  2) Group Training (GT): Uzbekistan, Afghanistan, Kyrgyz, Palestine, Tajikistan and Turkmenistan</p> <p>The target countries were selected among neighboring countries, with consideration to the level of industrial development, the level of technical education and vocational training and the technical level as well as diplomatic relations with Turkey and political situations of the countries.</p> <ol style="list-style-type: none"> <li>Overall Goal: Technical education and vocational training capacity on IAT of target countries is enhanced.</li> <li>Project Purpose: Technical education and vocational training capacity of teachers in IAT in target countries is enhanced.</li> </ol>												
Activities of the Project	<ol style="list-style-type: none"> <li>Project Site: Ankara, Izmir (Teacher Training Center (TTC) of Mazhar Zorlu Technical and Industrial Vocational High School (MZTVH))</li> <li>Main Activities: <ol style="list-style-type: none"> <li>Training needs identification of each country, Development/improvement of training curriculum, and Preparation/improvement of training materials, etc.</li> <li>Arrangement of logistics of training, Implementation and evaluation of training, etc.</li> <li>Development of a follow-up plan, Development of a web-based information system, Follow-up of the participants through the information system as well as the foreign offices of Turkish Cooperation and Coordination Agency (TIKA), and Evaluation of the impact of the training, etc.</li> </ol> </li> <li>Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Turkish Side</td> </tr> <tr> <td>1) Experts: 5 persons</td> <td>1) Staff Allocated: 16 persons</td> </tr> <tr> <td>2) Trainees Received in Japan: 3 persons</td> <td>2) Facilities (Computer laboratory, training materials, equipment for training room, etc.)</td> </tr> <tr> <td>3) Equipment: Training equipment</td> <td>3) Local cost</td> </tr> <tr> <td>4) Local cost</td> <td></td> </tr> </table> </li> </ol>			Japanese Side	Turkish Side	1) Experts: 5 persons	1) Staff Allocated: 16 persons	2) Trainees Received in Japan: 3 persons	2) Facilities (Computer laboratory, training materials, equipment for training room, etc.)	3) Equipment: Training equipment	3) Local cost	4) Local cost	
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Project Period	May 2012 to April 2015	Project Cost	(ex-ante) 150 million yen, (actual) 206 million yen										
Implementing Agency	Ministry of National Education (MoNE)												
Cooperation Agency in Japan	IC Net Limited												

**II. Result of the Evaluation**

## &lt;Constraints on Evaluation&gt;

Constraints on collection of data and information during the ex-post evaluation:

- Only limited information was obtained about the target countries in Central Asia and the Middle East, therefore it was impossible to examine some evaluation questions. Accordingly, judgement was made in such circumstances.
- Regarding the relevance, especially at the time of project completion, the consistency with the development needs was examined mainly with the situation in Turkey, due to the limitation in period and means of this evaluation study.

**1 Relevance**

## &lt;Consistency with the Development Policy of Turkey at the Time of Ex-Ante Evaluation and Project Completion&gt;

At the time of ex-ante evaluation, in the long-term strategy of TTC, it was clearly stated that TTC would become functioning as human resource development center of technical and vocational education and training (TVET) in the field of IAT both in Turkey and for neighboring countries. In the development plans of the target countries, industry development and human resource development for industrial promotion were prioritized. At the time of project completion, the project was in line with the Turkish national development plan, namely the “Tenth Development Plan (2014-2019)”, which emphasizes international cooperation through sharing experience with neighboring countries.

## &lt;Consistency with the Development Needs of Turkey at the Time of Ex-Ante Evaluation and Project Completion &gt;

At the time of ex-ante evaluation, it was planned in Turkey to utilize experience learned through cooperation with Japan to promote cooperation towards neighboring countries with the needs for human resource development in the field of IAT. No change in the needs was observed at the time of project completion.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

Assistance in South-South cooperation was one of the five priority areas agreed by Japan and Turkey in the economic cooperation policy dialogue in 2008<sup>1</sup>.

<Evaluation Result>

In light of the above, the relevance of the project is high.

## 2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

At project completion, there were differences in the achievement level of each indicator of the Project Purpose and it is judged that the Project Purpose as a whole was partially achieved. As to the indicators to examine the improvement of capacity in introduction of IAT programs in the CFT countries, all the four indicators were achieved in Kazakhstan (Indicator A), and all the three indicators were achieved in Pakistan (Indicator B). In Azerbaijan, out of the three indicators, one was achieved while the other two (the selection of a pilot college to introduce IAT programs and the number of trained teachers in the Basic IAT Course) were not achieved (Indicator C). In regard to the six GT countries, the awareness on importance of IAT was observed in each country, although the level of awareness varied among countries (Indicator D-1). The target for the number of teachers trained in the Basic IAT Course was not achieved (Indicator D-2).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The project effects have partially continued to the time of ex-post evaluation. In Kazakhstan, although the four pilot colleges selected during the project were not functioning due to budget shortage of the Ministry of Education and Science, the trained teachers have been implementing IAT training. In addition, preparation of establishing an IAT department has been under progress though there was a delay. In Pakistan, IAT training has not been implemented at the seven institutions selected during the project, but it has been implemented at the departments where the trained teachers are assigned. In Azerbaijan, the importance of IAT has been recognized. However, pilot institutions have not been selected and IAT departments have not been established either, therefore the trained teachers have not been implementing IAT training. Among the GT countries, in Kyrgyz and Palestine, as government policies for IAT promotion were established, the recognition of importance of introduction of IAT programs has been observed, and trained teachers have been implementing IAT courses. In Kyrgyz, additional three teachers became capable of teaching IAT courses. Out of the six GT countries, information on the other four countries was not obtained. Follow-up activities towards the target countries by Turkey are supposed to be provided based on requests by each country. However, as none of the target countries issued such requests, TTC/MZTVH has not provided training or follow-up. In addition, during the project period, a web-based training support information system was developed to promote communications among participants and between participants and TCC teachers as well as to provide support to participants after they went back to their own countries. TTC conducted updating the information and the system was utilized, However, the system was not fully utilized among participants expect for Pakistani participants, due to the English proficiency and the degree of access and skill of internet. Under these circumstances, the web-based information system developed during the project has not been appropriately maintained after the project completion and the web site cannot be accessed at the time of ex-post evaluation.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal was partially achieved at the time of ex-post evaluation. Among the three CFT countries, in Azerbaijan, trial IAT programs were not introduced, and no information was available on the situations in Kazakhstan and Pakistan. Among the GT countries, IAT training has been introduced in Kyrgyz and Palestine, therefore the indicator was achieved in these two countries. No information was obtained from the other four countries.

<Other Impacts at the time of Ex-post Evaluation>

In Kyrgyz, the Automation & Robotics Department was established, achieving the Indicator of the Super Goal, namely establishment of IAT department in one of the participant's institution. No negative impact has been observed.

<Evaluation Result>

In light of the above, the Project Purpose was partially achieved, and the capacity to introduce IAT programs has partially continued in the target countries. The Overall Goal has been partially achieved. Some countries achieved the Overall Goal although information was not available in other countries. Another positive impact has been observed. Therefore, the effectiveness/impact of the project is fair.

### Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results		
(Project Purpose)	(Indicator A: Kazakhstan)	Status of the Achievement: achieved (partially continued) (Project Completion) (Ex-post Evaluation)		
Technical education and vocational training capacity of teachers in IAT in target countries is enhanced.	A-1: Technical and Vocational Education (TVE) administrators are aware of what and how to introduce IAT program into the TVE. A-2: At least 4 TVE colleges are selected as IAT pilot college. A-3: At least 3 teachers		Project Completion	Ex-post Evaluation
		A-1	Participants of the executive training and the manager training developed action plans to introduce IAT programs to their schools.	It is judged that the training participants understood the procedure and method to introduce IAT programs, as they have been teaching IAT at their schools.
		A-2	Kazakhstan's Ministry of Education and Science selected 4 TVET colleges in Kazakhstan as the IAT pilot colleges.	Due to budget shortage of the Ministry of Education and Science, the selected pilot colleges have not been functioning as planned.
		A-3	3 teachers from each of the 4 pilot	Although the pilot colleges have not

<sup>1</sup> ODA Data Book (2010)

<p>from each pilot college become capable of teaching basic and intermediate IAT course as team.</p> <p>A-4: Basic IAT course program(s) are developed based on the training at TTC.</p>	<p>colleges attended the Basic IAT Course at TTC and successfully completed and achieved the goal of the course. According to the survey during the project period, the participants started teaching a part of theoretical subjects at the colleges where they belonged.</p>	<p>been functioning yet, the training participants, who are master teachers, have been implementing IAT-related training in the curriculum at the departments where trained teachers are assigned. Also the master teachers are expected to provide training to other teachers at other expanding schools.</p>	
	<p>A-4</p>	<p>The participants developed action plans to introduce Basic and Intermediate IAT Courses in their schools. As a result, all 4 colleges developed the programs and proposed the opening of them to the local education authorities.</p>	
<p>(Indicator B: Pakistan)</p> <p>B-1: TVE administrators are aware of what and how to introduce IAT program in their schools.</p> <p>B-2: At least 3 or more institutions are selected for the participation to training in TTC.</p> <p>B-3: 10 teachers are trained in Basic, Intermediate and Advance IAT course at TTC.</p>	<p>Status of the Achievement: achieved (partially continued) (Project Completion) (Ex-post Evaluation)</p>		
		<p>Project Completion</p>	<p>Ex-post Evaluation</p>
	<p>B-1</p>	<p>High-ranking administrators who attended the Executive Managers Course appropriately selected the candidates for the CFT training courses at TTC and provided support, so that teachers would be dispatched to TTC for training for 3 consecutive years.</p>	<p>It is judged that the training participants understood the procedure and method to introduce IAT programs, as they have been teaching IAT at their schools.</p>
	<p>B-2</p>	<p>A total of 7 institutions in Pakistan were selected and their teachers were sent to the Basic (2012), Intermediate (2013) and Advanced IAT Courses (2014).</p>	<p>Training has not been implemented and the training institutions have not been functioning as budget was not allocated by local governments.</p>
	<p>B-3</p>	<p>10 Pakistani teachers took part in all 3 courses, i.e. the Basic, Intermediate and Advanced IAT Courses.</p>	<p>Training related to IAT has been implemented in the curriculum at the departments where trained teachers are assigned.</p>
<p>(Indicator C: Azerbaijan)</p> <p>C-1: TVE administrators are aware of what and how to introduce IAT program in their schools.</p> <p>C-2: At least one institution is selected as IAT pilot college.</p> <p>C-3: 20 teachers are trained in Basic IAT course at TTC.</p>	<p>Status of the Achievement: not achieved (Not continued) (Project Completion) (Ex-post Evaluation)</p>		
		<p>Project Completion</p>	<p>Ex-post Evaluation</p>
	<p>C-1</p>	<p>A total of 8 administrators attended the Executive Managers Course. The Managers developed action plans to introduce the IAT programs to their schools.</p>	<p>Managers understand the procedure and method to introduce IAT programs (Source: The self-assessment of training participants).</p>
	<p>C-2</p>	<p>No IAT pilot college was selected. This is because it was not probable to introduce the IAT programs as the budget to purchase IAT equipment was not secured.</p>	<p>No pilot college has been selected as support by related government agencies has not been provided.</p>
	<p>C-3</p>	<p>There was no course to introduce IAT programs in vocational training schools in Azerbaijan and the Ministry of Education did not establish IAT pilot college as was planned because of budget shortage. Therefore, appropriate candidates were not convened, and the total number of participants of the Basic IAT Course was 15.</p>	<p>Trained teachers have not been implementing an IAT course, as no IAT department has been established. Meanwhile, the Ministry of Education of Azerbaijan is implementing a project “EU Support to Vocational Education and Training (VET) in Azerbaijan” (2017-2019) in collaboration with EU, targeting mainly for curriculum development of VET qualification (education standard). After the project, it is expected that the policies of VET development be clarified.</p>
<p>(Indicator D: GT countries- Uzbekistan, Afghanistan, Kyrgyz, Palestine, Tajikistan and Turkmenistan)</p> <p>D-1: TVE administrators</p>	<p>Status of the Achievement: partially achieved (partially continued) (Project Completion) (Ex-post Evaluation)</p>		
		<p>Project Completion</p>	<p>Ex-post Evaluation</p>
	<p>D-1</p>	<p>Based on the level of participation in managers’ course as well as assignment of appropriate human resources to Training of Trainers on TVET, it is</p>	<p>Uzbekistan: No information Afghanistan: No information Kyrgyz: Importance of IAT has been recognized as there are government</p>

	are aware of the importance of the IAT. D-2 : At least 10 teachers from each country are trained in Basic IAT course.		judged that the importance of IAT was recognized in each country.	policies on IAT program introduction and IAT education has been implemented at the pilot college. Palestine: Importance of IAT has been recognized as there are government policies on use and promotion of the latest IAT technologies. Tajikistan: No information Turkmenistan: No information
		D-2	Number of training participants at the time of project completion Kyrgyz 12 Tajikistan: 11 Turkmenistan: 6 Uzbekistan: 2 Afghanistan: 0 Palestine: 12 Total: 43 (Planned: 60 consisting of 10 from each country)	Uzbekistan: No information Afghanistan: No information Kyrgyz: Trained teachers teach students. Palestine: Trained teachers teach students. Tajikistan: No information Turkmenistan: No information

(Overall Goal) Technical education and vocational training capacity on IAT of target countries is enhanced.	(Indicator 1) Trial IAT program(s) is/are introduced to the participant's institution.	(Ex-post evaluation) Partially achieved Kazakhstan: No information Pakistan: No information Azerbaijan: IAT department has not been established yet but its importance has been recognized. Uzbekistan: No information Afghanistan: No information Kyrgyz: The Automation & Robotics Department was established. Palestine: IAT department has been established and the Ministry of Education and Higher Education has issued the policies on promotion of the IAT department. Tajikistan: No information Turkmenistan: No information
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The indicators for the Project Purpose and the Overall Goal were defined, taking the situations of each target country into consideration.

Source: Terminal Evaluation Report, Project Completion Report, Questionnaires to MZTVH and training participants in each target country

### 3 Efficiency

Although the project cost exceeded that plan, the project period was within the plan (ratio against the plan: 138% and 100%, respectively). Outputs of the project were produced as planned. Therefore, the efficiency of the project is fair.

### 4 Sustainability

#### <Policy Aspect>

In Turkey, "Vocational and Technical Education Strategy Paper and Action Plan (2014-2018)" describes the plan to strengthen TVET and to promote international cooperation in TVET. Among the target countries, development of vocational training is considered as important in the current global trends. In Kyrgyz, the President declared 2018 and 2019 as years of digitalization, emphasizing the importance of TVET as well as industry promotion. In Palestine, development of the curriculum and introduction of the latest equipment are under progress, in accordance with the declaration by the Minister of Education and Higher Education.

#### <Institutional Aspect>

In Turkey, sufficient number of teachers and administrative staff are assigned to TTC to implement training courses, according to the information of MoNE. Among the target countries, in Kyrgyz, organizational structures are developed to conduct training and related activities based on government policies. In Pakistan and Palestine, it can be judged that the organizational structure for IAT training has not been established due to problems such as the gap between the needs required in the industry and the contents and level of college curriculum, shortage of information, and access to training institutions. To cope with the situation in Pakistan, a practical curriculum responding to the needs is being developed and disseminated, and the collaboration with the industry is being promoted. Among the nine target countries, no information was obtained from six countries.

#### <Technical Aspect>

In Turkey, General Directorate of Vocational and Technical Education (GDVTE), under MoNE, has experience of training for both Turkey and foreign countries. Teachers have experience to conduct training in collaboration with the European Union, with sufficient communication skills in English. The staff at MoNE who had involved in the project have been still engaged in their duties, while the number of staff at MZTVH was increased from six (during the project period) to ten. Therefore, it is judged that the knowledge and experience related to the project have been continuously utilized. Training to the target countries has not been implemented since project completion, because there was no request from the target countries. However, MoNE has enough capacity to select appropriate institutions in Turkey and to conduct training, when a training request is issued by a target country. Among the target countries, in Kyrgyz, the staff have a sufficient technical level to continue IAT training. In Pakistan and Palestine, the trained teachers have been continuously teaching IAT courses. Among the nine target countries, no information was obtained from six countries.

#### <Financial Aspect>

In Turkey, the budget for TVET is allocated to GDVTE and MZTVH, then allocated to TTC by MZTVH. According to the questionnaire, the allocation of the budget for MZTVH and TTC is sufficient. In regard to training for neighboring countries, MZTVH and TIKA were respectively allocated

#### Budget for TVET (Unit: USD)

	2015	2016	2017	2018
MoNE/GDVTE	1.37 bn.	1.83 bn.	2.20 bn.	2.07 bn.
MZTVH	108,420	134,833	242,000	192,500

Source: MoNE, Formal Education Statistics 2017-2018

with approximately USD 10,000 and collaborated on providing training to neighboring countries. Regarding the target countries, information was obtained only from Kyrgyz and Palestine, and neither countries have secured financial resources for TVET on IAT as was planned at each school, and the budget is not sufficient, according to the questionnaire. These two countries are examining the possibility to secure the budget through financial assistance by overseas agencies. It is expected that the budget may be increased if the importance of the development of vocational training system is recognized in policies.

<Evaluation Result>

In light of the above, no problem has been observed in terms of the policy, institutional, technical and financial aspects of the implementing agency in Turkey, while in the target countries, some problems have been observed in the institutional, technical and financial aspects. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The project partially achieved the Project Purpose of enhancing TVET capacity of teachers related to IAT. It is said that the capacity of teachers have partially continued in general, as, among nine target countries, the capacity is continued in four countries but not continued in one country and information was not available for the remaining four countries. The Overall Goal of enhancing TVET capacity related to IAT in the target countries was achieved in some countries but no information was obtained from five countries out of nine, which means that the Overall Goal has been partially achieved. As to the sustainability, in Turkey, sustainability is high in the policy, institutional, technical, and financial aspects, while in the target countries, some problems have been observed in the institutional, technical, and financial aspects, because of the gap between market needs and technology taught at schools as well as the lack of budget and information. As to the efficiency, the project cost exceeded the plan. Considering all of the above points, this project is evaluated to be partially satisfactory.

**III. Recommendations & Lessons Learned**

Recommendations for Implementing Agency:

Follow-up of participants is important to conduct survey on the future trends of training and to plan and implement appropriate training. Therefore, it is necessary to actively discover the follow-up needs. The implementing agency is requested to facilitate the requests for the follow-up training by the target countries through collecting information about the situation of the target countries, instead of just waiting for such requests. Specifically, it is recommended to conduct follow-up once in one or two years, with the initiative of relevant departments of MoNE and in collaboration with each school.

Lessons learned for JICA:

It was difficult to trace the current status of training participants after the project completion, as there were many target countries. To efficiently conduct follow-up of the participants, it is necessary to establish a system to develop and maintain a web-site and to collect information of ex-participants. In order to follow up the participants for several years after the training, it may be advisable to formulate a mailing list and an information system during and soon after the training, so that the system would serve as a means of regular information sharing among the participants. In addition, it is important to appropriately maintain the developed mailing list and information system by the implementing agency. In conducting follow-up, it is important to obtain leadership of decision-makers of schools where the participants belong and to share the follow-up results with the ministry in charge. Therefore, it is desirable to send follow-up formats not only to participants but also to the responsible person of schools/institutes of the participants (signers of application form to dispatch participants) and person in charge of the ministry in charge. Furthermore, in south-south cooperation including training to neighboring countries, it is necessary to examine the monitoring and follow-up system to neighboring countries after the project completion at the early stage of the project formulation and to incorporate the monitoring and follow-up system into the project plan.



The equipment introduced to MZTVH is still being utilized during training.



One of the counterparts (right) was dispatched to Djibouti as expert and had discussions on the training in Turkey.