

**Ministry of Education and Technical Education  
Arab Republic of Egypt**

**Arab Republic of Egypt  
Project for Enhancement of Technical  
Secondary Education**

**Project Completion Report**

**March 2022**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**PADECO Co., Ltd.**

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## **Abbreviations and Acronyms**

3S	Sort/Set in order/Shine
ATS	Applied Technology School
CBC	Competency-Based Curriculum
CEQAT	Center for the Enhancement of Quality Assurance of Technical Education
C/P	Counterpart
EC	Executive Committee
EJEP	Egypt-Japan Education Partnership
EU	European Union
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ITEC	Integrated Technical Education Cluster
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
MOETE	Ministry of Education and Technical Education
OVI	Objectively Verifiable Indicator
PDM	Project Design Matrix
PMU	Project Management Unit
PR	Production according to Request
R/D	Record of Discussion
SB	Safe Behavior
SC	Steering Committee
SEWS	Sumitomo Electric Wiring Systems, Inc.
TE2.0	Technical Education 2.0
TM	Time Management
TOT	Training of Trainers
TVETA	Technical and Vocational Teachers' Academy
USAID	U.S Agency for International Development
WTU	Work Transition Unit

## Executive Summary

The Project for Enhancement of Technical Education is part of the Egypt-Japan Education Partnership (EJEP) cooperation in the area of technical education. With the project purpose of “The model activities for technical secondary schools that introduce Japanese-style technical education are disseminated in Egypt.”, the Project was originally planned from April 2017 to December 2020, the project period was extended to December 2021, and the target departments and schools were expanded for further dissemination and promotion of sustainability.

The Project developed a training package including “Guideline for Practical Lesson Improvement”. In the Guideline, the Project defined four main competencies: Production according to Request (PR), Safe Behavior (SB), Sort/Set in order/Shine (3S), and Time Management (TM), which students should acquire in technical secondary schools and an instruction method “repetitive practice and repetitive instruction” referring to Japanese-style technical education. The Project also developed a measurement tool for impact verification of teachers, and shared information related to the education in upper secondary schools in Japan (specialized course: Industry) with MOETE. Those materials would contribute to sustainability and dissemination of the model activities after the project completion.

### [Achievement]

The Project conducted activities according to four outputs to achieve the project purpose. The specific achievement of the Project is as follows.

Output 1: School management at pilot schools is improved through introducing Japanese-style school management systems.

The Project aimed to have students acquire TM competency, which was the most important to partner companies and the most difficult for schools to improve, at Pilot Schools. Through the Guideline training, the Project introduced model activities to Pilot Schools. As a result, the punctuality rate of teachers increased, which set a good example for students, and the punctuality rate of students also increased. Thus, the achievement level is judged as high.

Output 2: Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.

The Project aimed to have students acquire PR, SB and 3S competencies through the introduction of model activities at Pilot Schools. Teachers were trained on how to teach those competencies through “repetitive practice and repetitive instruction” in the Guideline training while they were also trained to obtain basic hard skills. The Project also provided the basic training equipment, tools and materials. As a result of practical lesson improvement through those activities, students’ competencies were improved. The improvement in PR was particularly significant, with the rate of products graded as “good” improving by 57 percentage points from 2% at baseline to 59% at endline. Thus, the achievement level is judged as high.

Output 3: Local companies and pilot schools are cooperating with each other.

The Project aimed to promote collaborative activities between Pilot Schools and local companies to help teachers themselves learn about the needs of companies and communicate them to students to engage in the repetitive practice. The collaborative activities became active, but they were interrupted at the time of the endline survey by the COVID-19 outbreak. However, except in that period, Pilot Schools conducted various activities, and students obtained more opportunities to know the needs of companies and think about their future after graduation. Thus, the achievement level is judged as relatively high.

**Output 4: New model schools that introduce Japanese style technical education are in operation.**

The Project aimed to help New Model Schools in Egypt to become better model schools by supporting them to introduce the same model activities as in Outputs 1 to 3: provision of the Guideline training, skills training, and basic equipment, tools and materials. In all of the four competencies, New Model Schools reached higher achievement than Pilot Schools through the introduction of model activities in more sufficient and flexible ways. This is because New Model Schools had greater discretion regarding the model activities implementation than Pilot Schools. The close monitoring and supervision by their partner companies also accelerated the implementation of model activities. One of New Model Schools also actively conducted several training programs not only at the school, but also for other schools in every school year. Thus, the achievement level is judged as high.

**Project Purpose: The model activities for technical secondary schools that introduce Japanese-style technical education are established at pilot schools and a new model school.**

All the indicators of the project purpose were achieved by the effectiveness of the four Outputs. “Guideline for Practical Lesson Improvement” was signed by the Minister of Education. Students’ satisfaction level with Japanese-style classes at Target Schools were improved. More graduates who sought jobs in their school year obtained jobs after graduation. Thus, the achievement level of the project purpose is judged as high.

**[Results of Review based on DAC Evaluation Criteria]**

The relevance, coherence, effectiveness and impact are judged as high. For impact, the overall goal “The model activities for technical secondary schools that introduce Japanese-style technical education are disseminated in Egypt.”, which is to be achieved by 2025, has been largely achieved at the time of project completion, by training sessions conducted by Mudiriya in their governorate, and project dissemination webinars at the local level and nationwide. For efficiency, the project inputs were generally efficient in regard to the project outputs. The sustainability is moderate. Some of Target Schools that achieved a high achievement level will be able to be a hub of dissemination of model activities in the future. In order to enhance the sustainability, funding for training and monitoring system should be considered.

**[Recommendation for the achievement of overall goals after the project completion]**

In order to sustain and disseminate the model activities after the project, three recommendations are made for the Egyptian side as described below.

**1. Establishing an environment to realize “repetitive practice and repetitive instruction”**

To continue and disseminate to the other schools, standardized skills training to improve teachers’ competency is required. Furthermore, adequate supply of consumables every year not only for adequate training of all students but also for teachers to maintain their skills is necessary.

**2. A mechanism to promote the introduction of “repetitive practice and repetitive instruction” model activities**

It is recommended that the Center for the Enhancement of Quality Assurance of Technical Education (CEQAT) incorporate the measurement tool “Competencies that schools and teachers can acquire by introducing ‘Guideline for Practical Lesson Improvement’, and their evaluation” into the school standard to be developed so that Mudiriya and other parties can monitor, supervise, and provide guidance.



**3. Collaboration with other development partners**

In the future, it is hoped that the Guideline training will be implemented by the Technical and Vocational Teachers' Academy (TVETA) and that "Competencies that schools and teachers can acquire by introducing 'Guideline for Practical Lesson Improvement', and their evaluation" will be used by CEQAT and, to promote this, it is recommended that collaboration be strengthened with other development partners who support Technical Education 2.0 (TE2.0).

# 1. Outline of the Project

## 1.1 Background and History

The unemployment rate in Egypt showed an increasing trend from 9.0% in 2010 to 13.2% in 2013. In terms of the percentage of the total number of unemployed (3,648,900 persons) by the level of education, those who graduated from technical secondary schools had the highest percentage (41.0%, 2013<sup>1</sup>), which is about 10 percentage points higher than the percentage of unemployed with university degrees or higher (31.1%). One of the reasons for this is that the human resources of technical secondary school graduates do not meet the needs of the industry. In addition, according to the “Survey on Information Collection and Confirmation in Technical Education in Egypt” (May 2016 to February 2017) conducted by the Japan International Cooperation Agency (JICA), one of the factors that prevented technical secondary school graduates from entering the workforce was the lack of fostering basic attitudes toward working, such as a sincere attitude toward work and moral compliance. According to interviews with Japanese companies in the same survey, the most expected competencies of graduates of technical secondary schools is compliance with group discipline (punctuality, etc.), but it was also revealed that some companies are aware of problems with the level of mastery. It is necessary for technical secondary schools in Egypt to practice the contents of education reflecting the needs of these industries.

On February 29, 2016, the Egypt-Japan Education Partnership (EJEP) was signed at the Japan-Egypt Summit held when President Abdel-Fattah El-Sisi visited Japan. This is an agreement between the governments of the two countries on the comprehensive educational partnership, from early childhood education to higher education, as an important pillar of their efforts to promote peace, stability, development, and prosperity, and it is clearly stated that Japanese-style educational activities would be introduced at each stage of education. In the joint statement, President El-Sisi expressed his interest in Japanese-style education, which emphasizes the cultivation of discipline and cooperation, as well as character building, based on the recognition that it is important to develop human resources with rich humanity that contribute to social development.

The Egyptian government requested Japan to implement a technical cooperation project to improve technical education in this context. JICA conducted a detailed planning study in October 2016 to confirm the validity of the project request and the required cooperation and reached an agreement with the Egyptian Ministry of Education and Technical Education (MOETE) to implement the Project in December 2016.

## 1.2 Project Overview

An initial overview of the project is summarized in the Record of Discussion (R/D) signed on December 28, 2016, and the Project Design Matrix (PDM) Version 0 contained in the R/D. The project period was planned to be from April 2017 to December 2020.

### (1) Amendment of the Project Design Matrix

The Project did not change the overall goal, the project purpose, the outputs, and the activities during the project period. However, the PDM was updated twice.

The first change was an elaboration of the indicators, and the elaborated PDM version 1.0 was signed on June 10, 2019.

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<sup>1</sup> Egypt in Figure 2015 (Labor). According to the latest Egypt in Figure 2021 (Labor), the figure is 34.6% (2019).

The second amendment was concluded on January 31, 2021. This amendment was concluded in response to MOETE's request for: (1) a trial of improving outputs by implementing activities in all departments, (2) expansion of results by the addition of one New Model School etc. Egypt and Japan sides agreed to extend the project for one year, and include the following activities in the R/D: (1) support for an additional New Model School, (2) dissemination of the model activities in all departments of one Pilot School (School T), (3) continuous follow-up of Pilot Schools and one New Model School, and (4) trial of the evaluation model by measuring the effect on mechanical teachers of one New Model School (School EA). PDM version 2.0 was included in the R/D. The R/D on January 31, 2021, including PDM version 2.0 is included in Appendix 1.

A summary of the project as described in the R/D and PDM is as follows.

## **(2) Overall Goal**

The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt.

## **(3) Project Purpose**

The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school.

## **(4) Expected Outputs**

Output1: School management at pilot schools is improved through introducing Japanese style school management systems.

Output2: Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.

Output3: Local companies and pilot schools are cooperating with each other.

Output4: New model schools that introduce Japanese style technical education are in operation.

## **(5) Counterpart Agency of the Project**

The counterpart (C/P) of the Project is the Technical Education Sector of MOETE.

## **(6) Pilot Schools**

Table 1-1 shows the target schools where the Project has introduced the model activities. The target schools are classified into two categories, Pilot Schools, and New Model Schools. Pilot Schools were selected from the existing technical secondary schools, i.e., conventional technical secondary schools and dual education schools<sup>2</sup>. New Model Schools refer to Applied Technology School (ATS)<sup>3</sup> that MOETE introduced in the 2018/2019 school year. Each school is given an abbreviation in Table 1-1, and this abbreviation will be used within this report.

The Project was initially launched with four Pilot Schools (School A, School P, School T, and School O). Output 2 was for one pilot department selected from each school while Outputs 1 and

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<sup>2</sup> The study hours for conventional technical secondary schools and dual education schools are different. Study hours at conventional technical secondary schools are organized into general subjects, common subjects, and elective subjects. The study hours at dual education schools are used for general subjects, technical subjects, and specialized practical lessons, which are training sessions in a factory.

<sup>3</sup> ATSS are technical secondary schools that are co-operated by MOETE and private companies with the purpose of providing international standards level technical education. Private companies are required for support for the improvement of school facilities and practical lesson equipment, as well as to provide opportunities for factory training, but the content of support can be changed flexibly between each school and each private company.

3 were for the whole school. The selected departments were the electronics department for School A, School P, and School T, and the mechanical maintenance department for School O. In September 2018, one New Model School (School EA) which had just opened was added to the list of target schools. The pilot department of School EA was the mechanical department.

**Table 1-1 Target Schools of the Project**

Type	School Name	Location/ Governorate	School Type	Abbreviation in the Report	Pilot Department
Pilot School	Dr. Ahmed Zewail school for dual education for girls	Port Said city, Port Said Governorate	Dual	School A	Electronics (Dual)
	Port Said Technical Secondary School for Girls	Port Said city, Port Said Governorate	Conventional	School P	Electronics
	El Tahrir Technical Secondary School for Girls	Port Said city, Port Said Governorate	Conventional / Dual <sup>4</sup>	School T	Electronics, Electricity(*), Computers(*), Decoration(*) and Ready-Made Garment(*)
	Al Obour Industrial Secondary School	Obour city, Kalyoubia Governorate	Dual/ Conventional	School O	Mechanical maintenance (Dual)
New Model School	El Araby School for Applied Technology	Quesna city, Monufia Governorate	ATS	School EA	Mechanics
	El Sewedy School for Applied Technology(*)	Diyarb Negm city, Sharqia Governorate	ATS	School ES	Mechanics, and Electric

Source: PDM version 2.0

Schools and departments with an asterisk (\*) were added in the project extension period

## (7) Project Implementation Structure

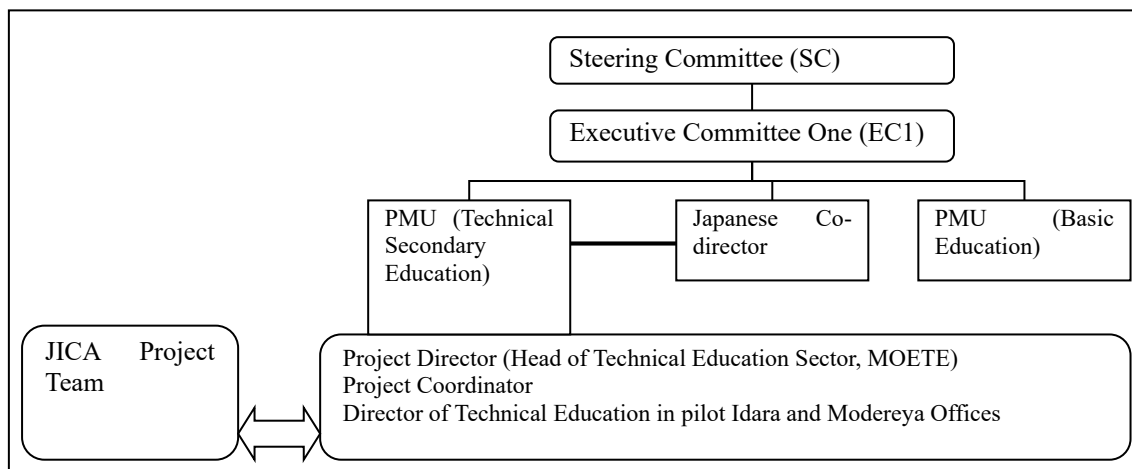
The Project is part of the EJEP's cooperation in the area of technical secondary education, and is integrated into the structure that promotes the EJEP. The EJEP has a Steering Committee (SC) chaired by Ms. Abulnaga, Advisor to the President for Security Affairs, under which is the Executive Committee 1 (EC1, chaired by the Minister of Education, and Technical Education), responsible for basic and technical education. Although not the C/P for the Project, an Executive Committee 2 (EC2, Chairperson: Minister of Higher Education) has been established to oversee the development of highly skilled human resources.

Under EC1, a Project Management Unit (PMU) was established to be in charge of technical secondary education. The members of the PMU, as defined in the R/D on December 28, 2016, are listed below. Figure 1-1 shows an implementation structure diagram including the below list.

- Project Director (Head of Technical Education Sector)
- Project Coordinator (Technical Education Department)
- Director of Technical Education in pilot Idara and Mudiriya Offices

<sup>4</sup> Only the Ready-Made Garment (RMG) department has both conventional classes and dual classes. The other departments have only conventional classes.

In addition, a Deputy Project Director has been appointed from March 2019.



Source: R/D (signed on December 28, 2016)

**Figure 1-1 Project Implementation Structure**

The Joint Coordination Committee (JCC) was not established in the Project, but this EC1 played its role.

### 1.3 Input

#### 1.3.1 Input from the Japanese Side

##### (1) Dispatch of Japanese Experts

Table 1-2 shows the technical areas and man-months (MM) of experts dispatched, and Appendix 2 shows the results of experts dispatched.

**Table 1-2 Dispatch Result of JICA Experts**

No	Technical Area	Total MM (Apr 2017–Mar 2022)		
		Field	Home	Total
1	Chief Advisor/Training Planning Management and Coordination 1	19.33	7.70	27.00
2	Training Planning Management and Coordination 2	5.47	0.55	6.02
3	School Industry Partnership	6.97	5.00	11.97
4	Industrial Training (Mechanical)	9.07	1.91	10.98
5	School Management 1/ Industrial Training (Electrical & Electronics)	11.47	0.90	12.37
6	School Management 2/ Training Planning Management and Coordination 2	20.77	8.91	29.68
7	Training Planning	0.00	1.90	1.90
8	Industrial Training (Ready Made Garment)	4.30	0.67	4.97
9	Industrial Training (Mechanical)	1.67	1.23	2.90
10	Industrial Training (Electricity/Computer)	0.00	5.98	5.98
	<b>Total</b>	<b>79.05</b>	<b>34.75</b>	<b>113.80</b>

Source: JPT

## (2) Local Staff

Table 1-3 shows the planned staffing on the PDM and the actual allocation.

**Table 1-3 Local Staff Deployment Result**

No	Plan in PDM	Actual Allocation
1	Interpreter/translator	Interpreter/translator (English-Arabic)/Project coordinator (part-time)
2		Interpreter (Japanese-Arabic) (part-time)
3	Local administrative coordinator	Local administrative coordinator 1
4		Local administrative coordinator 2
5	N/A	Senior Consultant 1 (part-time)
6		Senior consultant 2 (part-time)

Source: JPT

## (3) Equipment

Table 1-4 shows the procurement results of the equipment supplied by the Project. Table 1-5 shows the list of equipment provided to School EA by the JICA Egypt Office instead of the Project budget. The list of equipment is shown in Appendix 3.

**Table 1-4 Procured Equipment**

Equipment	Qty	Location for Use	Purpose
Laptop computer	1 pc	MOETE	For local staff
Multifunction copier	1 pc	PMU office	For print and distribution of materials
Basic items for the practical lessons (including fully automatic bells)	5 sets	School A, P, T, O, and EA	For trial and development of model practical lessons at four Pilot Schools and one New Model school
Lathe	1 pc	School O	For mechanical practical lesson
Bench drilling machine	2 pcs	School EA	For mechanical practical lesson

Source: JPT

**Table 1-5 List of Equipment Supplied from JICA Egypt Office to School EA**

No	Classification	Equipment	Qty
1	Lathe	Lathe	6
2	Grinding	Surface grinding machine	1
3		External cylindrical grinding machine	1
4	Milling	Vertical milling machine	1
5		Horizontal milling machine	1
6		Operation milling machine	1
7	Drilling	Bench drilling machine	2
8		Upright drill machine	1
9		Drill polishing machine	1
10	Welding	Arc welding machine	4
11		Oxyacetylene welding machine	4

Source: JPT

### 1.3.2 Input from the Egyptian Side

#### (1) Assignment of Counterpart Personnel

Of the personnel agreed upon in the R/D, those other than “other administrative staff” and “drivers” were assigned. The assignment history of the C/P is shown in Table 1-6.

**Table 1-6 C/P Deployment History**

No	Personnel Plan in R/D	Name	Position	Note
1	Director of PMU	Mr. Mohamed Ibrahim Hassan ElHalawany	Project Director	April - July 2017
2		Ms. Entsar Aly Abdelmaaboud Gomaa	Acting Project Director	August 2017 - February 2018
3		Ms. Habiba Ahmed Ezzeldine Hosny	Project Director	March 2018 - June 2020
4		Dr. Amr Bosila	Project Director	July 2020 -
5	Deputy Director of PMU	Mr. Ahmed El-Ashmawi	Deputy Director of PMU	March 2019-
6	Project Coordinator	Ms. Hala Naeim Abdelghafar Farahat	PMU Coordinator	April 2017 -
7		Ms. Noha Mohamed Nazmy	PMU Coordinator	April 2017 - June 2020
8	Director of Technical Education in Pilot Idara and Mudiriya Offices	Mr. Hassan Abdou Taher Mohamed	Director of Technical Education in Port Said Mudiriya	April 2017 – July 2019
9		Mr. Gamal Elsenosy Nagy Salem	Acting Director of Technical Education in Port Said Mudiriya	July 2019 - February 2020
10		Ms. Venus Ibrahim Ali El-Gneidy	Acting Director of Technical Education in Port Said Mudiriya	March 2020 - Aug 2020
11		Mr. Mohamed Mazan	Acting Director of Technical Education in Port Said Mudiriya	Aug 2020 -
12		Mr. Mohamed Ahmed Tammam Salama Sarhan	Manager of Technical Education in North Port Said Idara	April 2017 - July 2019
13		Mr. Ashraf Ibrahim Mosaad Shetiwy	Manager of Technical Education in North Port Said Idara	July 2019-
14		Mr. ElSadek ElSayed Mohamed ElSadek Hassanein Hassan	Director of Technical Education in Kalyoubia Mudiriya	April 2017-
15		Mr. Mohamed ElSayed Abdel Moaty Aly	Manager of Technical Education in Obour Idara	April 2017 -

Source: JPT

**(2) Facilities and Equipment**

An office for this project had been secured within the MOETE from April 2017 to December 2020. Along with the decision that the Government of Egypt is relocating administrative functions to New Capital, MOETE will also move there. Thus, the Project relocated the office to a new office of the PMU of the basic education in December 2020.

## 2. Japanese-Style Technical Education in the Project

The overall goal of the project is “The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt”. There is also a description of “Japanese-style technical education” on each output. Thus, this project is meant to refer to “Japanese-style technical education”. However, no document or book defines Japanese-style technical education in Japan. Nevertheless, practical lesson instruction methods used in Japan’s upper secondary schools (specialized course: industry) are quite different from those used in technical secondary schools in Egypt, and roughly the same methods are used throughout Japan. This is thought to be a result of Japanese culture. Therefore, the Project defined “Japanese-style technical education” by using the knowledge of two Japanese experts who have more than 30 years of teaching experience in Japan’s upper secondary schools (specialized course: industry) since April 2017, right after the project started. This chapter reports the definition of Japanese-style technical education in the Project and the dissemination tools developed in the Project.

### 2.1 Definition of Japanese-Style Education in the Project

The Project developed dissemination tools, including “Guideline for Practical Lesson Improvement”, which refers to Japanese-style technical education. These dissemination tools contain the definition of Japanese-style technical education (for example, the Project defined “repetitive practice and repetitive instruction” as its instruction method). This section introduces Japanese-style technical education defined by the Project in these tools.

#### Defining “Competencies” that students should acquire in technical secondary schools<sup>5</sup>

In the industry, having knowledge and skills is not enough to be useful. The industry seeks talents who have a sense of purpose and attitude to always perform work to satisfy the accuracy required by the client by utilizing knowledge and skills based on the knowledge. The person who has the knowledge, skill, and sense of purpose and attitude to perform using the knowledge and skills is called a person with competency.

#### **Competency is to have a combination of:**

- **Knowledge**
- **Skills based on the knowledge**
- **Sense of purpose and attitude to perform using the knowledge and skills**

#### **To do something**

#### Four main competencies that students should acquire in technical secondary schools

Although there are various types of competencies, the Project defined that technical secondary schools should focus on teaching the following four competencies required by companies and aim to have students acquire them through practical lessons<sup>6</sup>.

#### **Four Main Competencies**

- **PR: Production according to Request**
- **SB: Safe Behavior**
- **3S: Sort/Set in order/Shine**
- **TM: Time Management**

<sup>5</sup> To define this, the Project refers to the definition of Competency used in Technical Education 2.0 promoted by MOETE.

<sup>6</sup> These competencies are selected by interviews with the Project’s partner companies, Unicharm and Sumitomo Electric Wiring System, Inc (SEWS).



Definition of expected learning outcome

The Project defined teachers shall provide instructions to students so that they can reach the following performance levels concerning four main competencies.

**Table 2-1 Expected Learning Outcome**

Competency	Expected Performance Level (Learning Outcome)
<b>PR:</b> Production according to Request	Independently perform the basic steps (check requirements – work – confirm results) in order to produce work according to requests.
<b>SB:</b> Safe Behavior	Independently perform safe behavior to ensure safety at corporate manufacturing sites.
<b>3S:</b> Sort/Set in Order/Shine	Independently perform sort/set in order/shine at the workshop to increase product quality and to enable work efficiency.
<b>TM:</b> Time Management	Independently perform time management expected at companies.

Source: Guideline for Practical Lesson Improvement

Use “repetitive practice and repetitive instruction” as the instruction method.

In Japan, there are no special classes to learn these four main competencies. These are practiced repeatedly by the students in their daily school life and practical lessons, and if there is a mistake, the teachers repeat the instruction to make it a habit for the students. In other words, “repetitive practice and repetitive instruction” is a well-established instruction method. The Project adopted this as an instruction method of Japanese-style technical education.

How to teach the four main competencies using “repetitive practice and repetitive instruction”.

The following are typical instruction methods and preparations for teaching.

- **PR:** Improve instructions with the aim of enabling students to experience the more repetitive practice of basic steps (check requirements - work - confirm results). Specifically, the following should be done.
  - Introduction of small group system: In departments where the amount of equipment owned by the school is small (such as the mechanical department), small group practical lessons should be introduced to increase the time for many students to work. The appropriate number of students per group should be 4 to 10 students who can be supervised by teachers.
  - Introduction of small steps: Break down the work into small processes to increase the practice of the basic steps.
  - Devising the teaching sequence: After acquiring basic knowledge and skills, proceed to advanced topics.
  - Develop a system so that students can easily and repeatedly confirm the results of their work over and over. For example, distribute the specifications to each student so that they can easily refer to them.
- **SB:** The following should be done to enable students to act in accordance with the organization’s safety standards.
  - Create safety standards in the workshop. It is recommended that the three areas, dress code, safe behavior, and work environment be developed.
  - The standards should be posted in the workshop.
  - Practice this standard in every class.

- 3S: The following should be done to enable students to act in accordance with the organization's standards.
  - Create and display rules for sort/set in order/shine that students should implement.
  - Hold initial training of students.
  - Show a model by teachers themselves to practice sort/set in order/shine in the workshop.
- TM: The following should be done to enable students to independently perform time management expected at companies.
  - Create the standard of preparation time for the next class and communicate to students (five-minute break and display of timetable).
  - Introduce a system that allows the teachers and the students to know the time to start the next class (installation of clocks and chimes).
  - Communicate to the students what responses are to be provided if they fail to follow the standard for time management behavior (tardiness).

In this way, the Project showed how to practice Japanese-style technical education.

## 2.2 Training Package for Dissemination to School/Education Personnel

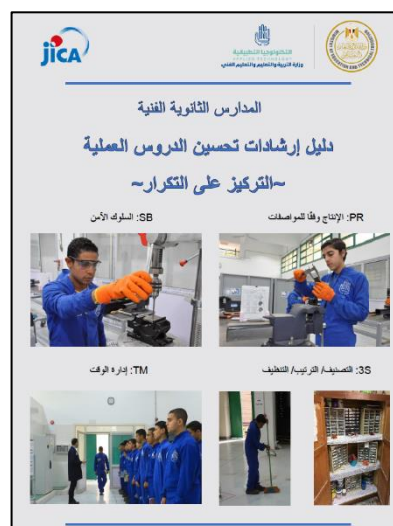
The following materials and resources have been prepared as a training package for dissemination to school and education personnel. It will be used in the Technical and Vocational Teachers' Academy (TVETA), which will be established as a training institute for technical and vocational teachers in the future, and will be published on Egypt Knowledge Bank.

### (1) Bound Version of “Guideline for Practical Lesson Improvement”

The Project developed “Guideline for Practical Lesson Improvement” referring to Japanese-style technical education. The Guideline is a basic document of Japanese-style technical education as defined above. The Guideline includes how to instruct the four main competencies by using “repetitive practice and repetitive instruction”, partnership with companies, and recommended implementation procedures. The first draft version was developed in February 2018 and the second draft version in June 2018 and was trialed in each school in 2018. The third version, reflecting the results of the trial, was developed in June 2019. The third draft version was signed by the Minister in January 2020 and became the MOETE approved version (the first bound version).

This bound version is 112 pages long because of the emphasis on detailed descriptions and the inclusion of two sample lesson plans (one for the mechanical department and another for the electronics department).

While the curriculum indicates “what to teach”, “Guideline for Practical Lesson Improvement” indicates to teachers “how to teach (instruction methods)”.

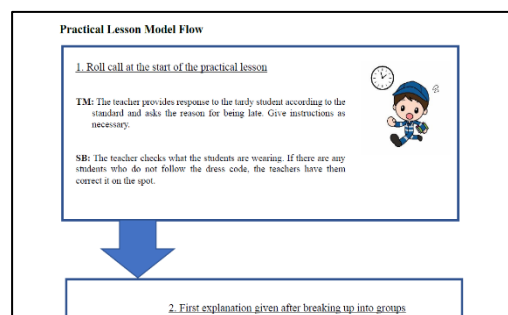


## (2) A Summary Version of “Guideline for Practical Lesson Improvement”

As a tool for easy reference, the Project created the seven-page summary version. The summary version includes a model practical lesson flow (Figure 2-1), which is not included in the bound version. In the model practical lesson flow, the practice has been divided into the following four scenes.

1. Roll call at the start of the practical lesson
2. The first explanation is given after breaking up into groups
3. During work
4. After work

Repetitive practice of the four main competencies is possible at each scene.



Source: Summary of “Guideline for Practical Lesson Improvement”

**Figure 2-1 Part of Model Practical Lesson Flow**

## (3) Video Materials of “Guideline for Practical Lesson Improvement”

The following six videos were produced to disseminate “Guideline for Practical Lesson Improvement” to non-project target schools. They were completed in July 2019.

1. Project Overview
2. PR: Production according to Request
3. SB: Safety Behavior
4. 3S: Sort/Shine/Set in order
5. TM: Time Management
6. Model practical lesson flow

Each video material corresponds to one of chapters 1-5 and the summary of “Guideline for Practical Lesson Improvement”. Each video is three to six minutes long so that the viewer’s concentration is not interrupted.



## (4) Best Practice Collection of “Guideline for Practical Lesson Improvement”

To promote the dissemination of “Guideline for Practical Lesson Improvement”, best practices from Pilot Schools and one New Model School were collected and prepared. It was completed in November 2021.

## (5) Competencies that Schools and Teachers Can Acquire by Introducing “Guideline for Practical Lesson Improvement”, and Their Evaluation

The Project developed competencies that are necessary for school organizations and individual teachers to introduce “Guideline for Practical Lesson Improvement” and evaluation methods of those competencies. These competencies will be acquired through the implementation of “Guideline for Practical Lesson Improvement”.

## (6) Standard Training Time

Table 2-2 shows the standard training time and materials for the training of “Guideline for Practical Lesson Improvement”. It can be implemented in a short time of three hours and 15

minutes. It is possible to conduct the training in about four hours even if opening speeches and break time are included.

**Table 2-2 Standard Training Time and Materials for the Guideline Training**

Topic	Standard Time	Standard Teaching Materials
Chap 1: What students learn in technical secondary schools	25 minutes	Bound version, video materials, and presentation materials for the training of “Guideline for Practical Lesson Improvement”
Chap 2: Production according to Request	35 minutes	
Chap 3: Safe Behavior	30 minutes	
Chap 4: 3S (Sort/Set in order/Shine)	30 minutes	
Chap 5: Time Management	20 minutes	
Chap 6: Partnering with companies	20 minutes	
Practical lesson model flow	20 minutes	Summary version and video materials of “Guideline for Practical Lesson Improvement”
Achievement test	15 minutes	Achievement test
Total	195 minutes	

Source: JPT

### (7) Presentation Materials for Training

The standard training hours were developed assuming to the use of mainly the presentation material for this training as well as the bound version and video materials of “Guideline for Practical Lesson Improvement”.

Of the above seven types of materials, materials other than video materials and standard training hours are included in the appendix.

**Attachment 4: A bound version of “Guideline for Practical Lesson Improvement” (English and Arabic)**

Attachment 5: Summary version of “Guideline for Practical Lesson Improvement” (English and Arabic)

Attachment 6: Best Practices of “Guideline for Practical Lesson Improvement” (English and Arabic)

Attachment 7: Competencies that schools and teachers can acquire by introducing “Guideline for Practical Lesson Improvement”, and their evaluation (English and Arabic)

Attachment 8: Presentation materials for “Guideline for Practical Lesson Improvement” (English and Arabic)

### (8) Training Personnel

During the Project period, private improvement (Kaizen) consultants served as the training facilitators. However, the Project developed the training package including six videos which are three to six minutes long each so that the training can be conducted without trainers with special knowledge and skills. Thus, trainers would not be necessary, but facilitators would be sufficient. Teachers from School EA and School A who have fully practiced the contents of “Guideline for Practical Lesson Improvement” are also fully capable as facilitators and can be used after the project is completed.

### **2.3 Resources for Policy Level Stakeholders**

“The Education in Upper Secondary School (Specialized Course: Industry) in Japan”, a report on vocational courses (industry) in Japan, was developed to help policy-level people better understand Japanese-style technical education. This document is included in Appendix 9.

### 3. Project Activities

With the overall goal in mind, the Project conducted activities according to the following four outputs of PDM to achieve the project purpose: “The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school”. Outputs 1 to 3 target Pilot Schools and Output 4 targets New Model Schools.

Output1: School management at pilot schools is improved through introducing Japanese style school management systems.

Output2: Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.

Output3: Local companies and pilot schools are cooperating with each other.

Output4: New model schools that introduce Japanese style technical education are in operation.

In the R/D signed on 28 December 2016, the opening of New Model School (School EA) was planned in September 2017. However, as the opening of the school was delayed by one year, the activities for Output 4 were also delayed by one year. In addition, PDM 2.0 was agreed between Japan and Egypt on 31 January 2021 to extend the project period by one year. A summary of the activities during the extension period is as follows:

- Support of an additional ATS
- Dissemination of the model activities in all departments of one Pilot School
- Continuous follow-up of the Pilot Schools and one New Model School
- Measurement of Project’s impact on the mechanical teachers of one New Model School (School EA), and
- Sharing information related to mechanisms to ensure the quality of technical education in Japan

In this chapter, the Project reports the results based on the activities described in PDM. A work flow chart is attached in Attachment 10, and a comparison table of planned and actual activities is attached in Appendix 11.

The impact of the COVID-19 outbreak since February 2020 has been enormous, resulting in a significantly shortened second semester of the 2020/2021 school year and the cancellation of many lessons at Pilot Schools. The instruction method of Japanese-style technical education, “repetitive practice and repetitive instruction”, was greatly restricted online. Although teachers continuously instructed wearing work clothes (SB) and returning tools after use (3S) in the limited practical lessons, the instruction opportunities for TM and PR were limited.

#### 3.1 Activities for Output 1

**1-1. The organizational framework of the pilot schools is improved.**

**1-2. Teachers and management positions of the pilot schools are trained to improve school management.**

The Project conducted the training to teach the instruction method “repetitive practice and repetitive instruction” referring to Japanese-style technical education for Output 1, Output 2 (except skills training), and Output 3. It is called “Guideline training” in the Project. In the Project, the Guideline training was conducted for teachers in Pilot Schools every year from 2017 to 2019.

Until the completion of the bound version of “Guideline for Practical Lesson Improvement”, the details were amended although a training framework referring to Japanese-style technical education did not change. This was because the Project improved the training contents based on feedback from trials of model activities at each Pilot School after the training. For example, because competencies and the type of main competencies had not yet been defined, they were not included in the training content in 2017. For training materials, a PowerPoint presentation referring to a Japanese vocational course (industry) was used in 2017, and the draft version of “Guideline for Practical Lesson Improvement” was used in 2018. From 2019, the bound version of the Guideline became available with the video materials, and it made the training content easier to understand. The number of participants in the Guideline training before the extension period is shown in Table 3-1. A total of 358 school management (principals and heads of departments) and all teachers of target departments received training directly from the Project’s Egyptian facilitators.

**Table 3-1 Number of Participants in the Guideline Training**

School	2017	2018	2019	Total
School A	44 (70)	46 (64)	27 (241)	275 (817)
School P	27 (126)	39 (89)		
School T	65 (152)	27 (72)		
School O	24 (70)	42 (113)	17 (118)	83 (301)
Total	160 (418)	154 (338)	44 (359)	358 (1,115)

Source: JPT

\*The numbers in parentheses are the numbers of all department teachers in the relevant year

After receiving the Guideline training, the trainees were in charge of delivering in-school training (cascade training). For example, in 2019, 44 teachers from four Pilot Schools participated in training by the Project, and 168 teachers (64% of all teachers in the Pilot Schools) participated in cascade training at each school.

In addition to the Guideline training, training in Japan for Pilot Schools took place in September 2017<sup>7</sup>. The training in Japan is described in more detail in Section 3.5.

#### The Guideline training for School T in the extension period

For “dissemination of the Project activities to a whole school”, the Project conducted the Guideline training for all 86 teachers of School T in 2021. All 86 teachers received training (100% participation). As described in Table 3-2, the result of the post-training questionnaire showed high satisfaction, understanding, and motivation to implement the model activities. A lecture on COVID-19 preventive measures was also provided at the beginning of training, and preventive measures were implemented during the training.

**Table 3-2 Questionnaire Result After the Guideline Training for School T**

Point of Question	Very High	High	Low	Very Low
Overall satisfaction with the training	82%	18%	0%	0%
Understanding the level of the training contents	89%	11%	0%	0%
Confidence that you can practice the recommended activities in the training	63%	34%	2%	1%
Motivation in improving students’ competencies by introducing the model activities recommended in the training	69%	30%	1%	0%

Source: JPT

<sup>7</sup> Training in Japan for School EA was conducted in September 2018.

**1-3. Pilot schools develop and implement action plans to improve student discipline in the school.**

**1-4. Pilot schools maintain and continue the improved conditions based on the action plan.  
Pilot schools maintain and continue the improved conditions based on the action plan.**

Each school developed an action plan every year based on the results of the training. Initially, Output 1 focused on improving discipline in general, but the priority was given to time management (TM), which is the most important issue for the partner companies and is difficult for the schools to improve. In “Guideline for Practical Lesson Improvement”, the Project defined the following three things that are necessary to improve students’ TM competency.

- (1) Create the standard of preparation time for the next class and communicate to students
- (2) Introduce a system that allows the teachers and the students to know the time to start the next class
- (3) Communicate to the students what responses are to be provided if they fail to follow the standard for time management behavior (tardiness)

In particular, (1) is important. “Guideline for Practical Lesson Improvement” describes the necessity as follows: “The current timetables at technical secondary schools do not have breaks between classes. This means that the students can’t be on time if they need to go to another classroom for the next lesson. This is the same with the teachers. Since there is no time to move between the classes, it is impossible to start lessons on time. In this environment, it is difficult to make time management a habit. Therefore, to acquire the habit of time management, the school creates a standard for the preparation time for the next class (including moving to the next classroom)”. In Japan, the break time is used to foster time management, rather than being seen as simply a rest period. There is a big difference in the opportunity of teaching time management between Egypt and Japan because there is only one opportunity in the morning line in Egypt while there are opportunities at every class in Japan. This might be one of the reasons for the difference in TM competency between Japanese and Egyptian students.

In the Guideline, the introduction of five minute-breaks and the display of the timetable were recommended for (1), and installation of clocks and a fully automatic bell system were recommended for (2). For (3), as there is a MOETE standard, communicating the standard to students was recommended.

The Project recommended each school to introduce four activities: a) introduction of a five-minute break, b) display of timetables, c) installation of clocks, and d) introduction of a fully automatic bell system from December 2017. In 2019, four Pilot Schools completed the implementation of these four activities, except the installation of clocks, which was only partially implemented. The reasons for the partial implementation of clock installation were due to administrative and budgetary constraints. After the 2020/2021 school year when shortened classes were introduced due to the COVID-19 outbreak, the five-minute break was suspended in School A and School P due to operational difficulties. Both schools plan to re-introduce the five-minute break after the start of regular school hours.

#### Action plan development for School T during the extension period

In the Guideline training in May 2021, key teachers attended a lecture and then developed action plans. The discussion on the action plan development had taken place in classrooms in the past training, but it took place in workshops. This made it easier for each teacher to check the current workshop status and decide what to do for improving the workshop environments such as the display posters for “repetitive practice and repetitive instruction” and instruction on safe



behaviors and 3S. For example, the Read-Made Garment (RMG) department investigated safe behaviors implemented at factories and displayed posters on safe behaviors at their workshops.

#### **1-5. Pilot schools conduct effective verification on student discipline.**

For effectiveness verification, the Project conducted a baseline survey, monitoring surveys, and an endline survey in collaboration with each school. Seven monitoring surveys were conducted every six months between the baseline and endline surveys. Each school used the survey results to verify the effectiveness of each activity. The verification methods are described in the endline survey report.

In addition, regular progress meetings were held with each school. The schools, Mudiriya, Idara, and partner companies attended. For example, each school reported the implementation status of the activities recommended in the Guideline at the progress meeting held in March 2019. The Project also reported a questionnaire survey on students' satisfaction with collaboration with partner companies. The progress meeting continues even under the COVID-19 outbreak. The progress meeting scheduled for March-April 2020 could not be held face-to-face due to the closure of schools and the temporary evacuation of Japanese experts, so the meeting was held online in May-June 2020. 25 people from Pilot Schools attended, including school management and representatives of departments. They shared the sixth monitoring survey result and discussed improvement. Since this was the first online meeting for the Project, a satisfaction survey of the participants was conducted using a questionnaire. 90% of them were satisfied with both the meeting contents and the smoothness of the proceedings.

#### **1-6. Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effect verification results.**

In the interviews conducted at the start of the Project with each Pilot School, Mudiriya and Idara as well as MOETE, it was found in 2017 that it would be more effective in Egypt to create a unified guideline that each school can refer to, rather than create the guideline at each Pilot School, which is supervised by Mudiriya/Idara and MOETE. Therefore, the Project developed "Guideline for Practical Lesson Improvement" referring to Japanese-style technical education. The Project used a draft version of the Guideline in trials in order to get lot of feedback from Pilot Schools and it developed a bound version of the Guideline. The Guideline was approved by MOETE in August 2019 and signed by the Minister in January 2020. Video materials were also developed to facilitate user understanding. Multiple video recording sessions were conducted at School EA in April 2019 and the video materials were completed in July 2019. In addition, a best practice collection of introducing the Guideline model activities by Pilot Schools was completed in November 2021.

### **3.2 Activities for Output 2**

#### **2-1. Pilot schools select a practical subject to be improved through model activities.**

It was discovered after the start of the Project that there was only one practical lesson subject in technical secondary schools (industry). However, due to its wide range of content and varying levels of difficulty, instead of selecting a practical lesson subject, the Project and Pilot Schools selected some priority topics in 2017. The selected topics are shown as below.

- Mechanical department of School O: filing, lathe, and filing and lathe
- Electronics department of School A: soldering, connecting resistances, rectifier circuits, amplifiers, and thyristors

- Electronics department of School P: soldering, connecting resistances, rectifier circuits, amplifiers, and oscillators
- Electronics department of School T: soldering, connecting resistances, rectifier circuits, amplifiers, and oscillators

#### Provision of basic training equipment, tools and materials

Equipment and materials necessary to implement the above topics were purchased in Egypt and provided to the schools (see section 1.3.1(3)).

#### Skills training during the extension period

The priority topics for the electricity, computer, RMG, and decoration departments of School T, which were added in the extension period (2021), were selected with a focus on topics in the first semester of Grade 1 and Grade 2 to evaluate basic skill improvement and skills training results. The selected topics are as follows:

- Electricity and computer department of School T: soldering, connecting resistors, training circuits, single-phase transformers, logical gates, and electric circuits
- RMG department of School T: training for sewing parts of clothes, blouses, trousers, sewing, and development of evaluation sheets and process sheets
- Decoration department of School T: Safety, tools, equipment and materials, colors, European calligraphy, water paintings, Arabic calligraphy, wood lacquer, synthetic paint, and decorating surfaces (walls and wood)

### **2-2. Training for teachers of the selected practical subject is conducted.**

While engineers in companies need to have mastered “skills”, practical teachers in technical secondary schools need to have mastered both “skills” and “instruction methods”. In the Guideline training, teachers were trained on how to teach PR, SB, 3S, and TM through “repetitive practice and repetitive instruction”. For PR (hard skills), which varies from department to department, experts of each technical area provided skills training for teachers. This is described in this section<sup>8</sup>. See Activity 2-1 for skills training topics.

#### Electronics department

Skills training was provided to representative teachers from School A, School P, and School T as shown in Table 3-3. There are three types of skills training: direct training, cascade training, and online direct training.

**Table 3-3 Training History for Electronics Teachers of Schools A, P, and T**

Year	Trainer	Topic	Days	Number of Participants	Notes
2017	JICA expert	Soldering	2 days	46 <sup>9</sup> (46)	
2018	JICA expert	Connecting resistors	2 days	9 (42)	
2018	JICA expert	Rectifier circuits	2 days	9 (42)	
2018	JICA expert	Oscillators	2 days	10 (42)	

<sup>8</sup> The instruction methods of PR, SB, and 3S covered in the Guideline training are general ones that can be used in technical education regardless of the department. In the skills training, while teachers mainly learned specialized skills for each discipline (hard skills), they also learned how to conduct “repetitive practice and repetitive instruction” of PR, SB and 3S by actual exposures of this instruction. As an example of PR, the teachers experienced how to divide the process into small steps, and measure the results at each step, and then utilized this method in their practical lessons.

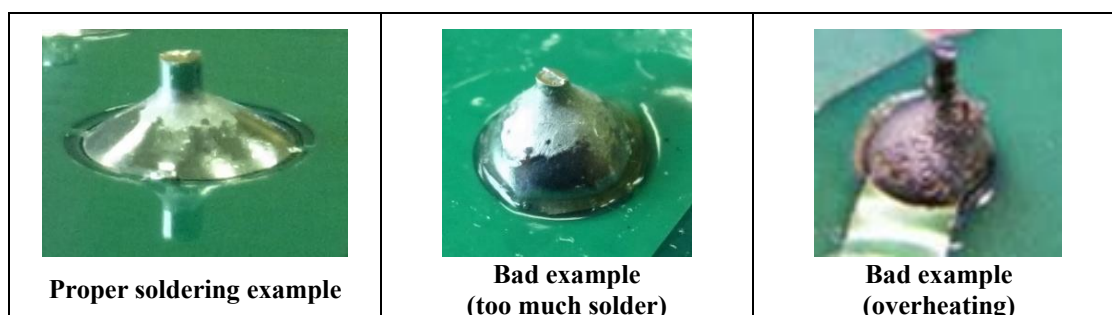
<sup>9</sup> Training for three groups was conducted for two days per a group.

Year	Trainer	Topic	Days	Number of Participants	Notes
2019	JICA expert	Amplifier circuits	2 days	10 (42)	
2019	JICA expert	Connecting resistors	6 days	7 (18)	Re-training
2019	JICA expert	Connecting resistors	2 days	8 (32)	Re-training
2019	JICA expert	Oscillators	2 days	7 (32)	Re-training
2020	One teacher each from School A, P, and T	Rectifier circuits	3 days	6 (32)	Re-training conducted under the supervision of a JICA expert
2020	JICA expert	Rectifier circuits	3 days	14 (22)	Online retraining <sup>10</sup>

Source: JPT

\*The number in parentheses are the numbers of teachers in the target department in the relevant year

In the direct training, a JICA expert conducted face-to-face training. In the first year of the Project, 2017, intensive training on soldering was provided. Although soldering is one of the most basic skills in the electronics department, many teachers lacked basic knowledge and skills (e.g., evaluation between proper and improper soldering (see picture below), understanding the need for correct cleaning of soldering tips). There were multiple factors. First, the teachers had never been taught by trainers who had the correct basic knowledge and skills. Second, the teachers used inferior boards and elements which had been used repeatedly due to budget constraints, so it was difficult to work correctly. Thirdly, the teachers did not know how to acquire basic skills, and there was an environment where the importance of basic skills was neglected. The first problem was solved with the instruction from the JICA expert. The second problem was solved by the provision of basic training materials from the Project. It took some time to complete the provision of the basic training materials, and they became available in October 2018. The third problem was solved by describing the method of “repetitive practice and repetitive instruction” in “Guideline for Practical Lesson Improvement”. Thus, many lessons were withdrawn during the implementation of skills training at the beginning of the project, which led to the development of “Guideline for Practical Lesson Improvement”.



To consolidate the basic knowledge and skills of the teachers, re-training sessions were provided on “connecting resistors” and “rectifier circuits”. In 2020, three teachers (one each from schools A, P, and T) who had attended skills training by the Japanese expert provided skills training in “rectifier circuits” to other teachers in each school under the supervision of the expert (cascade training).

In addition, after the COVID-19 outbreak made it impossible for the experts to travel to Egypt, the training was conducted directly online using an online application. The topic was “rectifier circuits”, an application of the previously conducted training with some modifications to the circuits.

<sup>10</sup> Training was conducted for three groups separately.

Mechanical department

Skills training on filing was delivered from a Japanese expert to three School O teachers in October 2017, and re-training on filing was conducted for aiming to train newly assigned mechanical department teachers in 2020.

In addition, mechanical department teachers at one New Model School (School EA) conducted skills training on the lathe for four School O teachers under the supervision of a Japanese expert in December 2019. School O had only one lathe and several teachers cannot work on it at the same time. As School EA had six lathes, the skills training was conducted at School EA. As all mechanical department teachers at School O were able to work at the same time, the training was conducted efficiently.

**Table 3-4 Training History of Mechanical Teachers of School O**

Year	Trainer	Topic	Days	Number of Participants	Notes
2017	JICA expert	Filing	2 days	9 (3)	3 teachers from School O out of 9
2019	6 School EA teachers	Lathe	2 days	4 (5)	Conducted under the supervision of a JICA expert
2020	JICA expert	Filing	1 day	4 (5)	Re-training

Source: JPT

\*The numbers in parentheses are the numbers of teachers in the target department in the relevant year

RMG department of School T

In the extension period (2021), the newly added RMG department of School T was provided with face-to-face training by a Japanese expert as shown in Table 3-5. Out of 19 practical teachers, eight or nine representative teachers attended the skills training.

**Table 3-5 Training History of RMG Teachers of School T**

Year	Trainer	Topic	Days	Number of Participants	Notes
2021	JICA expert	Blouses	6 days	8	
2021	JICA expert	Sewing parts of clothes	6 days	9	
2021	JICA expert	Trousers	6 days	9	
2021	JICA expert	Sewing practice, development of evaluation sheets and process sheets	9 days	9	
2021	2 School T teachers	Cutting and sewing etc.	8 days	3	Conducted under the supervision of a JICA expert

Source: JPT

Many teachers had insufficient basic knowledge and skills (e.g., turn to stitch), and were not at the technical level required by their students' employers (factories). The first factor of this was the teachers' lack of knowledge of the skills required by industry. The second factor was lack of practice (lack of training opportunities).

The first factor was solved by the following two instructions to the teachers: 1) the Japanese expert created sample products and had the teachers compare them with the teachers' products, and 2) the expert created evaluation items and had the teachers check standards of good and defective products at each evaluation item. The second factor was solved by repetitive practice of basic

skills (practice for sewing parts) and repetitive practice of modification and checking requests at each process by using process check sheets.

Through this training, the teachers became aware of their lack of skills, recognized a necessity to improve their skills, were convinced to practice the basic skills repeatedly, and actively practiced repetitively. In the future, this practice should become a habit. In addition, the participants conducted a series of cascade training from October 2021 for the three teachers who could not attend the direct training by the Japanese due to a lack of equipment.



**Skills training by the Japanese expert**



**Checking finished dimensions**

#### Electricity /Computer department of School T

For the electricity/computer department newly added in the extension period (2021), the Project had a joint training system with a Japanese expert (online) and local trainers. For the computer department, one of the teachers who had received the direct training from the Japanese expert was selected as one local trainer, and for the electricity department, a teacher from candidates recommended by MOETE was selected as another trainer through an interview.

The Japanese expert in Japan conducted online skills training of trainers (TOTs) by utilizing an online meeting application for the local trainers, and then the local trainers conducted the skills training for target teachers under the supervision of the Japanese expert.

The TOTs were conducted in three steps: 1) preparation of lesson plans by the Japanese expert and the local trainers, 2) demonstration of the lesson plans by the local trainers, and 3) improvement through guidance from the Japanese expert to the local trainers.

The training for the target teachers by the local trainers was conducted in August and September 2021 as shown in Table 3-6. Eleven representative teachers of the electricity department and four teachers of the computer department attended the training.

**Table 3-6 Training History of Electricity and Computer Teachers of School T**

Year	Trainer	Topic	Days	Number of Participants	Target
2021	Local trainer	Soldering	2 days	10	Electricity (3), computer and electronics teachers (7)
2021	Local trainer	Connecting resistors	3 days	10	
2021	Local trainer	Logical gates	3 days	9	Computer teachers (4), electricity teachers (5)
2021	Local trainer	Training circuits	4 days	9	Electricity teachers
2021	Local trainer	Single-phase transformers	4 days	9	Electricity teachers
2021	Local trainer	Electrical circuits	3 days	10	Electricity teachers

Source: JPT

\*The numbers in parentheses are the numbers of teachers who attended from each department

Through this training, since some problems with the basic skills of soldering and connecting resistors were found, additional training was given at the end of September. Furthermore, practical training on the creation of the sterilization gate was provided in November.



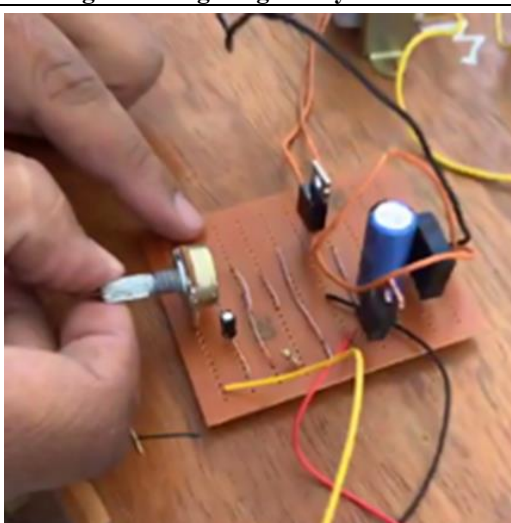
**Training on training circuits by the local trainer**



**Training on the logical gates by the local trainer**



**Manufacture of small power supplies**



**Additional training on soldering**

### Decoration department of School T

A local trainer conducted skills training for teachers of the decoration department of School T newly added in the extension period (2021). The local trainer was selected by an interview with candidates MOETE recommended.



The Project conducted the Guideline training for the local trainer. In addition, a Japanese expert provided advice on the preparation of lesson plans based on three points: correct skills, “repetitive practice and repetitive instruction”, and evaluation. In consultation with the local trainers, Arabic calligraphy was selected as an evaluation target of the baseline survey and the endline survey. For this purpose, the teachers created products before and after the training, and a significant improvement in their understanding of a theory and basic skills was observed<sup>11</sup>. The evaluation criteria for the Arabic calligraphy were developed by the local trainer with the advice of the Japanese expert, and self-evaluation by teachers themselves was introduced. The self-evaluation helped teachers to understand the lack of skills and the correct skills. As the Project had only the local trainer and did not have a Japanese expert for the decoration department, the Project closely followed up by checking the training progress and support on communication between the local trainer and the teachers. The training was conducted from July to August 2021, as shown in Table 3-7. Four to six representative teachers out of 16 decoration teachers attended the skills training.

**Table 3-7 Training History of Decoration Teachers of School T**

Year	Trainer	Topic	Days	Number of Participants
2021	Local trainer	Safety, tools, equipment, and materials	2 days	4
2021	Local trainer	Colors	1 day	6
2021	Local trainer	European calligraphy and Gouache colors	1 day	5
2021	Local trainer	Creating and applying water paintings	2 days	6
2021	Local trainer	Arabic calligraphy (Kufi and Geometric)	4 days	6
2021	Local trainer	Wood lacquer (with and without a dye)	3 days	5
2021	Local trainer	Synthetic paint (air dry)	2 days	6
2021	Local trainer	Decorating surfaces (walls and wood) with Coromandel and Relief techniques	4 days	6

Source: JPT

<sup>11</sup> Because there were no students’ products kept at the time of the baseline survey, the Project evaluated teachers’ products before and after the skills training.

- 2-3. Pilot schools introduce trial practical education to improve students’ basic hard skills and soft skills.**
- 2-4. Pilot schools conduct improved practical education.**

Improvement on “PR: Production according to Request”

One of the four main competencies that technical secondary school students should acquire, as defined in “Guideline for Practical Lesson Improvement”, is PR: Production according to Request, which can be achieved by the following basic steps (1. check requirements, 2. work, 3. confirm results). In three Pilot Schools in Port Said (School A, T, and P), “3. confirm results” had not been sufficiently practiced. Thus, products created by students during practical lessons did not meet requirements. The skill level of “2. work” was also very low.

However, as a result of the Guideline training given to the teachers, the basic steps (1. check requirements, 2. work, - 3. confirm results) are now taught. A model flow has been introduced to explain to the students; 1) the teacher sets the example, 2) the students work, and 3) the teacher observes how the students work and gives instructions. It enabled the students to check the operation of electronic circuits and measure products in the practical lesson. In other words, “3. confirm results” was introduced (see the photo on the right). Table 3-8 shows a comparison before and after the Guideline training.



**Table 3-8 Comparison between Before and After the Guideline Training**

Basic step	Before Training	After Training
Check requirements	The teacher showed the handout and explained the requirements of the practical lesson.	The teacher explained the requirements of the practical lesson, showing the actual electronic components and the equipment used.
Work	When a student work on soldering, the teacher did not correct the student’s mistakes. As a result, a lot of time was spent correcting the mistakes after the whole work was completed.	The teacher showed the students how to do the soldering work correctly and then had the students do the work (being a model). The teacher also divided the work into small steps and taught the students to confirm a result before proceeding to the next step. As a result, no time loss happened, and opportunities for repetitive practice increased (introduction of small steps).
Confirm results	No measurement was taken.	The teacher showed the students how to measure and then had the students measure and analyze the results.

Source: JPT

School O also improved “2. work” and “3. confirm results”: The Project conducted skills training on filing for teachers, and then the teachers utilized what they learned during the training when teaching the students. Thus, the students’ working time in practical lessons became longer than before, and the quality of teaching also improved. This improvement contributed to the improvement of students’ products level (See section 4.1).





**RMG: Teachers and students who made a poster on PR**



**RMG: Demonstration by a teacher**



**Electricity: Checking the connection of the electric motor windings using a lamp**



**Electricity: Verification test after completion of electrical wiring connections**



**Decoration: A teacher who made a tool explanation (PR)**



**Decoration: Working students**

SB: Safe Behavior

Safety instruction is often given only once at the beginning of the year in technical education in Egypt. In Japan, teachers have students practice behaviors on “safety” in every practical lesson (repetitive practice), and if they are not able to do so, the teachers give “repetitive instruction” to make “safe behavior” a habit of students. Each Pilot School’s teachers defined workshop safety

rules and displayed them. Thus, the students became able to check “what the correct safe behaviors are” repetitively.

For example, teachers provide safety instructions to all students using safety behavior posters displayed in workshops at the beginning of practical lessons in School O. The teachers also appointed individual students to explain safety behaviors in front of other students, and teachers provided additional explanation when necessary, to help students understand the safety behaviors and increase their safety awareness. During the work, the teachers explained safe behaviors again by showing work demonstrations with equipment. Continuous skills training for teachers and budget deployment for the maintenance of tools and protective equipment are needed.

One of the challenges is that teachers do not have sufficient knowledge of the correct use of equipment and tools and sometimes are unable to teach correct safety behavior. Inadequate maintenance of equipment and tools, and lack of proper tools and protective equipment for practical lesson tasks are some of the factors that may compromise safe training. Continuous skills training for teachers and budget allocation for the maintenance of tools and protective equipment are needed.

### 3S: Sort/Set in order/Shine

Teachers in Japan have their students practice 3S in their daily practical lessons to make it a habit through repetitive practice. Each Pilot School implements this instruction with minimal cost by defining 3S rules and displaying the rules in workshops. Students repeatedly take tools from the storage room at the start of lesson and put them back after lesson. This helps students to have a 3S habit.

#### **2-5. Pilot schools conduct effective verification.**

As in Activity 1-5, the Project conducted the baseline survey, the monitoring surveys, and the endline survey with each school. Details are shown in Activity 1-5.

### **3.3 Activities for Output 3**

For the students to acquire the competencies required by companies, teachers need to conduct “repetitive practice and repetitive instruction” to consolidate the students’ knowledge and skills. For the students to be motivated for repetitive practice, the teachers themselves need to know the needs of the companies by visiting them. Then they need to communicate this in a way that students can understand. The more the teachers know, the better they will be able to teach their students about the needs of the companies and employment. In addition, students’ knowledge of various information about companies’ employment conditions, working conditions, and career paths after employment will motivate them to study in technical secondary schools. Furthermore, it is expected to reduce the turnover rate after employment by reducing the mismatch in career choice. For these goals, the Project conducted various activities in partnership with companies.

#### **3-1. Pilot schools establish the Work Transition Unit.**

Due in part to MOETE’s policy of establishing a Work Transition Unit (WTU), it was established in each school by the end of 2017.

**3-2. The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data)**

**3-3. The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainers, and/or practical training at the companies, by collaboration with local partner companies.**

School management, the WTU and teachers from various departments worked together to initiate various activities, and by the 2018/2019 school year, each school was actively engaged in collaborative activities with companies. However, due to the impact of the COVID-19 outbreak that started around February 2020 (shortened semester duration, dispersed school attendance, etc.), it became difficult for Pilot Schools to implement the activities. Therefore, only existing dual and semi-dual training programs<sup>12</sup> were conducted in the 2020/2021 school year, but each school resumed active activities in the 2021/2022 school year. It is noteworthy that in the 2021/2022 school year, the activities have spread to departments other than the pilot department, and it is expected that the activities will continue to be active in each school after the project ends.

#### Graduate advisory session

Thirteen graduate advisory sessions were conducted between 2017 and 2021 in four Pilot Schools. This activity, which had been suspended since 2020 due to the COVID-19 outbreak, was resumed in the 2021/2022 school year. In the 2021/2022 school year, the activity spread beyond the pilot departments and was implemented in the air conditioning department in School O and the wire harness department in School A. In School T, the activity was implemented in the departments added during the extension period<sup>13</sup>. In a survey of students after the session, more than 90% of students responded that the session was "useful" or "very useful". The sessions are opportunities for students to think about their future after graduation and the lessons they need to take in school.

#### Company job fair

Seven company job fairs were held in four Pilot Schools from 2017 to 2021. In the company job fair of Sumitomo Electric Wiring Systems, Inc. (SEWS), one of the partner companies, held in April 2018, a total of 111 students attended from School A, P, and T, and 70 students submitted their applications. These results would motivate not only students but also teachers.

#### Company visits

The results of company visits by teachers, students, and guardians are shown in Table 3-9. Guardians of School O also visited a factory. On this occasion, the guardians complained that the salary was low and the working rules were too strict. However, in addition to the explanation by the company, students explained the usefulness of the training in the company as their own opinion and persuaded their guardians, which showed the new possibility of dual education.

**Table 3-9 Number of Visits to Partner Companies**

School Year	A	P	T	O	Total
2017/2018	0	0	3	0	3
2018/2019	0	0	0	1	1
2019/2020	3	2	4	2	11
2021/2022 (as of November 2021)	0	0	1	1	2
Total	3	2	8	4	17

Source: JPT

<sup>12</sup> The semi-dual training is a factory training program promoted by Port Said governorate. Students of school T and P received the training at the local companies in this program.

<sup>13</sup> The session was also conducted in School P. As School P has only electronics department, there is no dissemination to the other department.

Some of the company visits undertaken are shown in Table 3-10. Two company visits were conducted to each of the Project partner companies: Unicharm and SEWS.

**Table 3-10 Examples of Company Visits**

No	Company	School	Target	Achievement
1	Unicharm	O	Teachers	Participants understood and were convinced of the actual application of the four main competencies in the company.
2	SEWS Egypt	A, P, and T	Teachers	
3	YKK Egypt	O	Teachers	Participants understood the actual application of the four main competencies in the company and learned about the hiring requirements of the company.
4	Riyada	A, P, and T	Teachers	
5	Royal Cosmetics Co.	T	Students	Participants learned about the actual conditions of the factory production line and the working environment.
6	Lotus Garments Co.	A and T	Teachers, students, and guardians	Participants learned about the actual working environment and working conditions at the factory.

Source: JPT

#### Graduates career database

The graduate career database has been developed and operated by the pilot departments since 2018. Among the pilot department graduates of Pilot Schools, the rate of graduates who provided information was 43% for June 2018 graduates, 63% for June 2019 graduates, 38% for June 2020 graduates, and 68% for June 2021 graduates. The data was used for planning activities such as factory visits.

#### Support partnership enhancement between partner companies and schools

To promote partnership between Unicharm and School O, which started dual cooperation in the 2017/2018 school year, meetings between the parties involved such as Unicharm, School O, Mudiriya were held several times each year from December 2018. For example, through the meetings, the school gave early notice of the exam schedule, and the company adjusted its hiring schedule. The Project also provided side support to SEWS in its discussions with MOETE on the opening of a new model school (ATS).

### **3.4 Activities for Output 4**

At the time of the R/D conclusion (December 2016), there was no school type-name for New Model Schools, but MOETE adopted the name ATS (Applied Technology School) when New Model Schools opened in 2018. ATS has a new concept of schooling with stronger corporate partnerships than traditional dual education, and MOETE aims to establish 100 ATSs by 2030; as of December 2021, 28 ATSs have already operational.

Output 4 aimed to make New Model Schools in Egypt a better model school by supporting one New Model School (School EA) with the contents of Outputs 1-3. During the extension period, it was decided to support another New Model School (School ES). In this section, the activities for these two schools are shown.

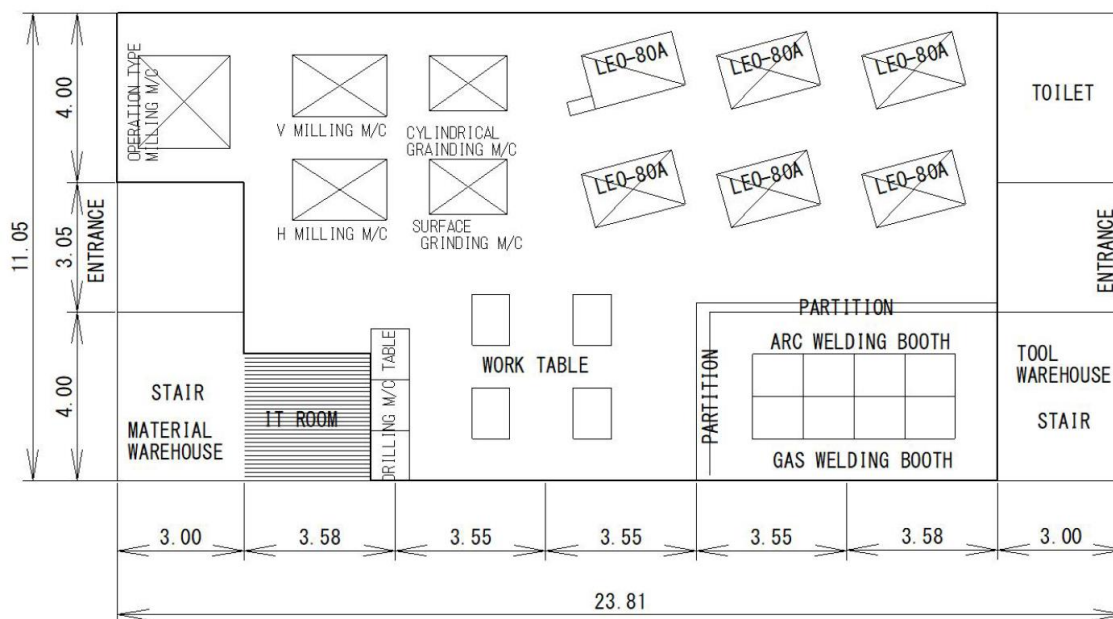
#### **4-1. Technical advice necessary for establishing a new model school is provided.**

At the time of signing the R/D (December 2016), School EA was due to open in September 2017, but at the start of the Project (April 2017), this was postponed to September 2018. This allowed sufficient time for consultation and advice before the school opened. Several pieces of advice were given as follows: 1) training in Japan before the opening of the school, 2) a proposal of

workshop layout, 3) promotion of understanding of Japanese-style technical education, and 4) advice on the curriculum.

For 1), the training in Japan is described in Section 3.5(1).

For 2), the Project proposed a workshop layout so that teachers could conduct “repetitive practice and repetitive instruction” which is an important element of Japanese-style technical education. To conduct “repetitive practice and repetitive instruction” in the mechanical department, it is necessary to create an environment where students can work constantly, either by purchasing the same number of pieces of equipment as the number of students or by introducing a rotation system with small groups. The former was impractical due to the high cost of equipment and the need for a large workshop floor space. Instead, the Project proposed the introduction of a small group system and a layout to suit this. The Project also proposed types of equipment and necessary quantity of equipment for the main topics (filing, lathes, milling machines, and welding machines). For workshop layout, the greatest attention was paid to the number of students per class and the number of machines. The Project aimed to have one lathe available per student. At the time of the proposal, it was envisaged that 24 students of one class would be divided into four small groups (six students per group). In line with this, the Project proposed six lathes and six welding machines. The Project proposed that students in four groups rotationally practice operating filing, lathes, welding machines, and milling machines to increase students’ working time and opportunities for repetitive practice. The approved layout proposal is shown in Figure 3-1. A picture of the workshop after the installation of the machines is also shown in Figure 3-2.



Source: JPT

**Figure 3-1 Workshop Layout Idea Approved**



Source: JPT

**Figure 3-2 Workshop After Installing Equipment**

For 3), there were various opportunities to promote understanding of Japanese-style technical education. For example, when discussing the proposal of workshop layout, the Project gave a lengthy explanation of the aims of Japanese-style technical education. Specifically, the Project explained that repetitive practice is necessary to consolidate skills, the introduction of a small group lesson is effective for this, and repetitive practice is possible during practical lessons by repeating basic steps. The Project also suggested that repetitive practice is necessary even in higher grades. The necessity of repetitive practice in higher grades was explained by using the example of lathe training. Lathes are often taught only in Grade 2 in Egypt, while in Japan, lathes are taught in Grade 1, then in Grade 2, and then there is a little review and CNC, which is an advanced topic of lathe topic, is taught in Grade 3. The skills are established by learning and repetitively practicing every grade. By discussing the necessity for “repetitive practice and repetitive instruction” to consolidate the skills several times before the opening of the school, the school management understood the necessity for this deeply and did not hesitate to adopt the proposals.

For 4), curriculum advice was also given before the opening of the school. The mechanical curriculum of School EA was based on the Integrated Technical Education Cluster (ITEC) curriculum<sup>14</sup>. The curriculum was based on the Italian method and in which the lathe was taught only in Grade 2. However, the Project advised the school to instruct Grade 1 and 2 as described above.

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<sup>14</sup> The ITEC provides in total a seven-year education course composed of a three-year upper secondary school level education, a two-year Intermediate Technical College, and Advanced Technical College. As of 2021, there were four ITECs in Egypt.

Several pieces of advice given during these preparatory stages for the opening of the school have been a major foundation for the success of School EA since then.

**4-2. The new model school selects a practical subject to be improved through model activities.**

During the discussions with the partner company, El-Araby, in July 2017, El-Araby requested the mechanical department to be a target. MOETE and JICA accepted this request and agreed to support the mechanical department. It was also agreed to focus on basic topics (filing, welding, and basics of lathe).

For School ES added in the extension period, all departments (mechanical and electric departments) became the target. It was also agreed to focus on basic topics.

**4-3. Equipment necessary for the new model school to improve practical training of the selected subject is prepared.**

The equipment for the mechanical department of School EA was discussed between the Project, El-Araby, MOETE, and JICA based on the first draft of the equipment list submitted by El-Araby in July 2017, and a provision of equipment as described in section 1.3.1(3) was agreed. The delivery delays were addressed by starting with topics that could be done without the equipment (e.g., filing). All equipment had been delivered in January 2020.

**4-4. The new model school develops organizational framework, including the Work Transition Unit, to manage model activities in the new model school.**

**4-5. Training for teaching and management level staff, of the new model school on improvement of school management is conducted.**

The Guideline training for teachers and staff was conducted several times from 2018. The Guideline training was conducted for 33 teachers by using “Guideline for Practical Lesson Improvement” (draft version 2) in August 2018 before the opening of the school and in November 2018. Training in Japan was also conducted in September 2018. The teachers who participated in the training in Japan shared the results of the training with the other teachers in November 2018. This training included contents of time management, practical lessons, and partnership with companies.

For School ES, a three-part training program consisting of guideline lectures, action plan development, and presentations was conducted for 21 teachers in May 2021. Teachers from each department reviewed their instruction methods, and the current state of their workshops, and discussed how to introduce “repetitive practice and repetitive instruction”. For example, the mechanical department decided to introduce small group practical lessons to ensure sufficient time for students to work. Each department decided to improve the workshop environment and introduce posters for repetitive practice of safe behavior and 3S. Management decided to conduct activities in partnership with companies, such as collecting information on students’ career desires and collecting information on companies.

The number of participants in the Guideline training for New Model Schools (total number of participants) is shown in Table 3-11.

**Table 3-11 Number of Participants to the Guideline Training**

School	2018	2019	2020	2021	Total
School EA	33	37	0	0	70
School ES	-	-	-	21	21
Total	33	37	0	21	91

Source: JPT

**4-6. The new model school plans and implements initial activities to improve school management so as to enhance students' discipline.**

**4-7. The new model school maintain improved conditions and continues activities**

The four activities introduced in Pilot Schools (introduction of five-minute breaks, timetable display, clock installation, and fully automatic bell system) were introduced. While Pilot Schools spent a long time introducing the activities, School EA introduced all of them in November 2018, two months after the opening of the school, except for the timetable display, which was partially in place. Furthermore, the school also introduced its fingerprint attendance management system and made great efforts to raise awareness of time management, targeting attendance and lateness. The school has since continued to implement all the activities. Thus, the school culture for developing TM competency has been fully established. Even after the closure of the school in mid-March 2020 due to the COVID-19 outbreak, the school continued to check students' attendance and absence and to teach time management through online classes.

School ES had its time management system, with class leaders (students) holding the clocks and leading other students to ensure that all students were able to move between classrooms within the allotted time. Although the four activities recommended by the Project were not incorporated at the start of the extension period, this approach enabled students to manage their time well, and School ES started to introduce timetable display and clock installation for further improvement of students' TM competency.

**4-8. The new model school conducts effective verification on students' discipline.**

As in Pilot Schools, the Project conducted monitoring surveys and an endline survey with School EA to verify the effectiveness. As a large input was made by training in Japan, the Guideline training, and skills training before the opening of the school, no baseline data were available. School EA used the results of these surveys to reconfirm the effectiveness of each activity. Progress meetings were also held with School EA regularly to share survey results. Unlike Pilot Schools, New Model Schools are not supervised by Mudiriya and Idara. Thus, they did not attend the progress meetings. Instead, the representatives of the partner company El-Araby attended each meeting. For example, all teachers and the representatives of El-Araby attended the progress meeting held in March 2019. The school reported on the implementation of the activities recommended in "Guideline for Practical Lesson Improvement", and the Project reported on the results of a survey on students' satisfaction with the partnership with the partner company.

School EA has also undertaken its activities for verification. The school has had students conduct self-evaluation on four main competencies recommended in the Guideline since the 2018/2019 school year. The school also has recorded students' tardiness in all lessons in addition to attendance/absence management by fingerprint authentication.

Due to the impact of the COVID-19 outbreak, the progress meeting planned for March-April 2020 was postponed, and it was held online in July 2020. Seven school managers and departmental representative teachers attended. Since School EA achieved target values in all four competencies, the participants made plans for further improvement.



<b>4-9. Training for teachers of the selected practical subject is conducted.</b>
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Mechanical department of School EA

Skills training started in August 2018, before the opening of the school. The training history up to 2020 is shown in Table 3-12.

**Table 3-12 Training History for Mechanical Teachers of School EA**

Year	Trainer	Topic	Days	Number of participants	Notes
2018	JICA expert	Filing	2 days	4 (4)	
2018	JICA expert	Arc welding	2 days	4 (4)	
2018	JICA expert	Electric	2 days	4 (4)	
2019	JICA expert	Gas welding	3 days	4 (4)	
2019	JICA expert	Electric	2 days	4 (4)	Re-training
2019	JICA expert	Filing	3 days	4 (4)	Re-training
2019	JICA expert	Filing	1 day	4 (4)	Re-training
2019	JICA expert	Lathe	5 days	6 (6)	
2019	JICA expert	Milling	6 days	6 (6)	
2020	JICA expert	Gas welding	3 days	4 (6)	
2020	JICA expert	Lathe	1 day	5 (6)	Re-training
2020	JICA expert	Relay sequence control	4 days	6 (6)	Online

Source: JPT

\*The numbers in parentheses are the numbers of teachers in the target department in the relevant year

All training was provided directly by a Japanese expert. Training topics ranged from filing, welding (arc and gas), basic electrical circuits, lathes, and milling machines. Some topics were re-trained to consolidate basic knowledge and skills. When the Japanese expert could not travel due to the COVID-19 outbreak, online skills training in relay sequence control was provided<sup>15</sup>.

In addition to the skills training, the Project also instructed them on the development of a training plan that incorporates small group lessons and the arrangement of training topics from basic to advanced, referring to “Guidelines for Practical Lesson Improvement”.

Furthermore, the Project made training opportunities twice from School EA teachers to other school teachers to consolidate the knowledge and skills. In December 2019, six EA teachers gave skills training to four mechanical teachers at School O under the supervision of the Japanese expert. In September 2021, eight School EA teachers gave training to four School ES teachers.

Mechanical department of School ES

For the mechanical department of School ES, which was added in 2021, four mechanical department teachers were trained in the following three steps.

1. Orientation by a Japanese expert (venue: School ES for three days),

<sup>15</sup> Two devices for the relay sequence control skills training were manufactured in Japan and one of them was delivered to School EA, so that the Japanese expert and the Egyptian mechanical department teachers had the same device at hand. The training was conducted online, with the Japanese expert giving a theoretical lecture using presentation materials, explaining how to work with the equipment by showing the Japanese expert demonstration online, and the mechanical department teachers working on the equipment. The training was effective, although it took some time due to the lack of electrical knowledge of the mechanical teachers. On the other hand, it took a long time for the equipment to be delivered due to the customs clearance in Egypt. It is recommended to procure the equipment in Egypt if similar training is to be conducted in the future.

2. Cascade training for School ES teachers from School EA teachers who had been trained by the Japanese expert as local trainers (under the supervision of the Japanese expert, venue: School EA, topics: filing, lathe, and arc welding, for three days each)
3. Direct training from the Japanese expert to School ES teachers (Venue: ES school)

Before the cascade training, eight local trainers (School EA teachers) were trained as trainers (TOT). The cascade training took place at the well-equipped School EA. After that, direct training (re-training) by the Japanese expert was conducted at School ES to make them proficient in the use of their equipment.

**Table 3-13 Training History of Mechanical Teachers of School EA**

Year	Trainer	Topic	Days	Number of participants	Venue
2021	JICA expert	3S	0.5 days	4 <sup>16</sup> (4)	School ES
2021	JICA expert	Safety	1 day	4 (4)	School ES
2021	JICA expert	Measurement	2 days	4 (4)	School ES
2021	School EA teachers	Filing	3 days	4 (4)	Under the supervision of a JICA expert at School EA
2021	School EA teachers	Lathe	3 days	4 (4)	
2021	School EA teachers	Arc welding	3 days	4 (4)	
2021	JICA expert	Measurement	1 day	2	School ES, for two newly assigned teachers
2021	JICA expert	Lathe	5 days	6 (6)	School ES
2021	JICA expert	Milling	5 days	6 (6)	School ES

Source: JPT

\*The numbers in parentheses are the numbers of teachers in the target department in the relevant year



**Cascade training in School EA (filing)**

**Cascade training in School EA (lathe)**

<sup>16</sup> Six of electricity teachers also attended.



Direct training in School ES (lathe)



Direct training in School ES (milling machine)

Electric department of School ES

Cascade training was conducted for the electric department of School ES by six electric department teachers at School EA under the guidance and supervision of a Japanese expert. The first step was to conduct online training of trainers (TOT) by the Japanese expert, which consisted of three steps: 1) preparation of lesson plans by the Japanese expert and the local trainers, 2) demonstration of the lesson plans by the local trainers, and 3) improvement by guidance from the Japanese expert. After the TOT, the local trainers conducted the training for five School ES teachers, while the Japanese expert observed the training online and provided feedback to the local trainers. The training topics were home lighting installations, electric machines, and electric power installations.

**Table 3-14 Training History of Electric Teachers of School ES**

Year	Trainer	Topic	Days	Number of participants	Notes
2021	School EA teachers	Home lighting installations	3 days	5 (6)	Conducted under the supervision of the JICA expert
2021	School EA teachers	Electric Machines	3.5 days	5 (6)	Conducted under the supervision of the JICA expert
2021	School EA teachers	Electric power installations	3.5 days	5 (6)	Conducted under the supervision of the JICA expert

Source: JPT

\*The number in parentheses are the numbers of teachers in the target department in the relevant year



Skills training



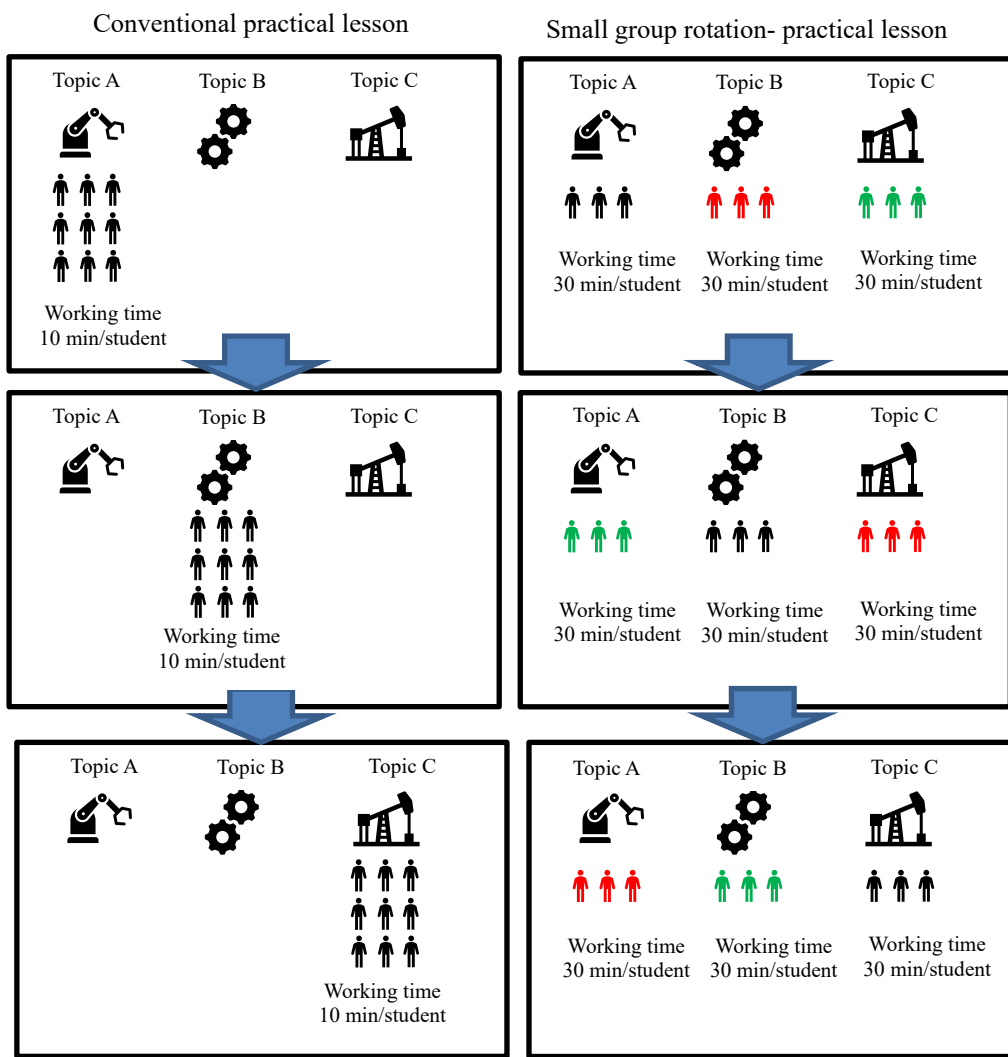
Skills training

**4-10. The new model school introduces practical education to improve students' basic hard skills and soft skills.**

As described in Activity 4-1, the Project conducted the training in Japan, proposed workshop layout, promoted the understanding of Japanese-style technical education, and gave pieces of advice on curriculum. After the school opened, the Japanese experts continued practical lesson observation and instruction. As a result, the School EA teachers conducted the improved instruction in their practical lessons by incorporating the model activities recommended in “Guideline for Practical Lesson Improvement”.

In the practical lessons of the mechanical department, the small group system recommended in “Guideline for Practical Lesson Improvement” was introduced soon after the school opened. In the small group system recommended in the Guideline, students in a class are divided into multiple groups (Figure 3-3). As illustrated in this example, each group works on a different topic at the same time, thus significantly increasing the amount of time spent per student. This kind of teaching of multiple topics in one class at the same time requires coordination with Mudiriya and Idara in ordinary technical secondary schools where the content of instruction is fixed for each semester, but it was easy to implement in School EA.

In a traditional practical lesson, each topic is covered in turn. If there are nine students in a class, one piece of equipment for each topic, and 90 minutes of practice time, each student will have 10 minutes to work with the equipment for each topic. On the other hand, in the small group rotation system, students are divided into small groups and multiple topics are conducted simultaneously. In this case, the amount of time each student can work with the equipment increases to 30 minutes for each topic in the same 90-minute class.



Source: JPT

**Figure 3-3 Conventional Practical Lesson and Small Group Rotation- Practical Lesson**

Before the opening of the school, School EA had decided to run the course in four groups, but due to an insufficient number of mechanical department teachers employed, the school decided to run the course in three groups, with eight students per group. Nevertheless, the work time of the students has increased significantly compared to other schools due to the innovative way in which each group studies a different topic at the same time, which has never been done before in Egypt.

School EA also re-designed the topic order so that the basics are taught in Grade 1 and advanced contents are taught in Grade 2 referring to the Guideline. Students would forget skills without repetitive practice. School EA has adopted the Japanese method of promoting the retention of knowledge and skills through instruction across the grades in this way. Furthermore, the school has introduced a small step to increase the practice of basic steps. In addition, to make it easy for students to check the results of their work, again and again, the school has created a system that allows them to refer to the specifications at any time, as shown in the picture on the right.



In addition, following the model practical lesson flow recommended in “Guideline for Practical Lesson Improvement” (summary), “repetitive practice and repetitive instruction” of all four competencies are thoroughly conducted in the practical lessons.

#### Mechanical department of School ES

In developing the action plan at the Guideline training, the Project explained the necessity of introducing small groups to increase students’ working time, and discussed the method of implementation with the mechanical department teachers and the principal. As a result, the small group system was introduced in October 2021. For Grade 1 filing lessons, teachers divided 25 students into five groups, had each student practice filing at five work-tables, and one to three teachers instructed them. For Grade 2 lathe lessons, the teachers divided 25 students into five groups, have each of them practice sequentially on three lathe machines, and three teachers instructed them on each lathe machine. School ES has not yet reached the level of teaching different topics at the same time as School EA, but it is expected that School ES will learn from School EA and make other improvements in the future.

#### Electric department of School ES

As described in Activity 4-9, the Project conducted skills training (cascade training) for the School ES electric department teachers from six School EA electric department teachers under the supervision of a Japanese expert. In the skills training, the Project and School EA teachers devised an instructional plan so that School ES teachers could learn how School EA teachers are teaching the four main competencies to students in their practical lessons. As a result, by experiencing School EA’s practical lesson methods, which skillfully incorporate the four main competencies, in their skills training, School ES electric department teachers were aware of what was missing from the current practice and are trying to improve it. For Grade 1, the teachers divided 23-25 students into eight groups, and two teachers and occasionally another assistant teacher instructed students to improve the instruction method.

**4-11. The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data)**

The Project introduced the objectives and model activities of collaborative activities with companies, in the Guideline training and supported School EA in implementing the activities. As a result, School EA actively conducted collaborative activities a strong partnership with El-Araby. In the 2018/2019 school year, the following six activities were conducted: 1) information session for parents (the school explained to parents the importance of dual factory training and the importance of the project's four main competencies), 2) progress report meeting (teacher representatives presented their achievements, challenges and plans regarding time management, practical lesson improvement and partnership with companies), 3) factory training in dual education, 4) orientation for students by the partner company (safety, 5S, ISO, etc.), and 5) counseling session for students during dual factory training, and 6) skills training for students during summer vacation.

However, from the second semester of the 2019/2020 school year to the 2020/2021 school year, due to the impact of the COVID-19 outbreak, there was only one collaborative activity: a factory training program in dual education. Activities resumed in the 2021/22 school year, and as of November 2021, the four activities had been implemented (factory training in dual education, a factory visit, graduate advisory session, and company job fairs).

In School ES, which was added in the extension period, two activities were conducted in the two months of October-November 2021 (factory training in dual education and company job fairs).

**4-12. The new model school tries to introduce model practical education such as final year project work in order to become a local model for technical secondary schools.**

The Project has provided opportunities and suggestions about the activities for School EA to become regional model schools. For example, the Project recommended and coordinated visits by SEWS to School EA. School EA itself also coordinated visits by El-Sewedy and MOETE officials. Starting in 2019, the school started partnering with neighboring technical universities, making School EA a model of excellence for the country of Egypt beyond the region. In addition, the Project has often introduced "Kaizen" to the school, and the school has been applying this idea by collecting "Kaizen" ideas from the students at any time to cultivate their "Kaizen" spirit. Good ideas are given a budget so that students can challenge themselves to create their projects. The school also encourages their students to apply to International Science and Engineering Fair, and several students have participated.

### 3.5 Common Activities for Output 1-4

#### (1) Training in Japan

Training in Japan was conducted twice to strengthen the capacity of C/Ps.,

- First training: September 9 - 21, 2017
- Second training: September 1 - 15, 2018

#### Outline of Implementation

- Purpose: Trainees understand Japanese-style technical education through observations and discussions in Japanese technical secondary schools, government institutions, and companies in which graduates from technical secondary school are working.
- Outcome: To make action plans which are adaptable in technical secondary schools in Egypt referring to the examples in Japan.

To achieve the purpose, the following five-unit objectives were set and the places to visit were decided. Unit 5 has the same content as the outcomes.

- Unit 1: To understand the characteristics of Japanese style technical secondary education (and supports from Japanese local government).**
- Unit 2: To understand the characteristics of school management, career support service, and practical lessons in technical secondary schools in Japan.
- Unit 3: To understand how graduates from technical secondary schools utilize their skills which they learned in their school days into actual work.
- Unit 4: To understand the system of teacher training in Japan and its contents which maintain the quality of teachers.
- Unit 5: To set up action plans which are adaptable in Egypt for improvement of school management and practical lessons, and student career support based on the experience in training in Japan.

The main visiting site at the first and second training in Japan is described in Table 3-15.

**Table 3-15 Main Visiting Sites during Training in Japan**

Unit	First training	Second training
Unit 1	Kanagawa Prefectural Board of Education	Kanagawa Isogo Technical High School
Unit 2	Kanagawa Isogo High School Kanagawa Technical High School Kanagawa Shokou High School	Kanagawa Technical High School Chiba Keiyo Technical High School
Unit 3	NHK Spring Co., Ltd. TATSUNO Corporation	TATSUNO Corporation
Unit 4	Kanagawa Prefectural Education Center	Kanagawa Prefectural Education Center
Unit 5	All visiting sites are the target	All visiting sites

Source: JPT

### Participants

The list of participants of the first training in Japan is shown in Table 3-16. The five participants from Pilot Schools were selected from several candidates through interviews conducted by the Project, PMU, and Mudiriya.

**Table 3-16 List of Participants of the First Training in Japan**

No.	Name	M/F	Mudiriya (Governorate)	Position/Organization (as of training)
1	Hala Naeim Abdelghafar Farahat	F	-	Coordinator of PMU/Specialist in Industrial Education Management in Ministry of Education and Technical Education (MOETE)
2	Hassan Abdou Taher Mohamed	M	Port Said	Director of Technical Education/ Port Said Mudiriya
3	Mohamed Ahmed Tammam Salama Sarhan	M	Port Said (North Port Said)	Manager of Technical Education (industrial) /North Port Said Idara
4	ElSadek ElSayed Mohamed ElSadek Hassanein Hassan	M	Kalyoubia	Director of Technical Education /Kalyoubia Mudiriya
5	Mohamed ElSayed Abdel Moaty Aly	M	Kalyoubia (Obour)	Manager of Technical Education /Obour Idara
6	Hassan Mostafa Ahmed Mostafa	M	Kalyoubia (Obour)	Principal / Obour Industrial School



No.	Name	M/F	Mudiriya (Governorate)	Position/Organization (as of training)
7	Amr Abdelmoneim Mohamed Ahmed	M	Kalyoubia (Obour)	Senior teacher, Practical Teacher in Mechanical Maintenance and Repairing / Obour Industrial School
8	Hanan Mohamed Abouelwafa Mohamed Issa	F	Port Said (North Port Said)	First Teacher, Practical Teacher in Electronics / Ahmed Zeweil school
9	Tarek Hassan Mohamed Hussein Hamlit	M	Port Said (North Port Said)	First Teacher, Theoretical teacher in Electronics / Tahrir School
10	Salwa Hassan Abdou Hassan Gomaa	F	Port Said (North Port Said)	Deputy Principal / Port Said industrial school

Source: JPT

Table 3-17 shows the list of participants of the second training in Japan. Five participants from School EA were selected from several candidates through interviews conducted by the Project, PMU, and the partner company (El-Araby).

**Table 3-17 List of Participants of the Second Training in Japan**

No.	Name	M/F	Mudiriya (Governorate)	Position/Organization (as of training)
1	Habiba Ahmed Ezzeldine Hosny	F	-	Advisor to minister of TE / MOETE
2	Taha Ahmed Eraki Khalaf	M	-	Member of Deputy Minister office for TE/ A member of the executive council for TE schools applying international standards/ Head of Mechanical Department on ITEC
3	Sayed Mohamed Ahmed Mohamed	M	Monufia	Educational Principal (Practical lesson, school management, career guidance) /NM school
4	Ahmed Noaman Aboud	M	Monufia	Quality Officer (Practical lesson, school management, career guidance)/ NM school
5	Amin AbdelHamid Nibar	M	Monufia	Mechanical Lab Technician (Practical Teacher)/NM school
6	Sahar Hussein Shalkamy Othman	F	Monufia	Theoretical and Practical Electric Teacher (Lecture and practical lesson, school management)/ NM school
7	Saber Mohamed Ahmed AbuShady	M	Monufia	Theoretical and practical Air Condition Teacher (Lecture and practical lesson, school management)/NM school

Source: JPT

#### Training outcomes and utilization after returning home

- The first training in Japan: The action plan drafted by each Pilot School in Egypt in July 2017 was revised during the training to be more specific in its activities. The revised draft action plan was reviewed and revised slightly by the PMU after the trainees returned to Egypt, and was approved by the Deputy Minister in October 2017. Thereafter, school improvement activities were initiated in each school.
- The second training in Japan: The targeted outcome “To develop the action plan that can be implemented at the technical high schools in Egypt concerning the case studies in Japan” was achieved by trainees as the action plan was prepared during the training. The

level of achievement of unit objectives 1-5 was measured by a questionnaire survey on the level of understanding of each unit for each trainee, and the trainees themselves thought that they had a good understanding of the contents of this training. The action plan developed was valid, which indicates that the level of understanding was quite good. The action plan was shared with all teachers in two separate in-school trainings at School EA after their return, in November 2018. Regarding time management, all activities recommended by the Project were introduced, including the introduction of five-minute breaks and a display of timetables. For the improvement of the practical lesson, small group and some systems to facilitate repetitive practice were introduced. Regarding the partnership with companies, students were able to understand the necessity of various skills by visiting factories of departments other than those related to their department.

## **(2) Related to the COVID-19 Outbreak**

The Project shared reference material for COVID-19 precautions in practical lessons by referring to materials from the Ministry of Education, Culture, Sports, Science, and Technology in Japan.

## **(3) Measurement of Project's Impact on the Mechanical Department Teachers at New Model School (School EA)**

The draft of the measurement tool for impact verification on teachers was developed, and trials were conducted at School EA. After modifying the tool, the Project conducted the second trial and completed the tool in November 2021.

## **(4) Sharing Information Related to the Education in Upper Secondary Schools in Japan (Specialized Course: Industry)**

In the 2019/2020 school year, MOETE launched Technical Education 2.0 (TE 2.0) to transform technical education. TE2.0 consists of five pillars<sup>17</sup>. The Project has the potential to contribute to all of the pillars, but especially to the third pillar (strengthening teachers' capacity through training and qualification). This is because the Project has focused on teachers in the Guideline training and skills training. MOETE is planning to institutionalize the third pillar of training in the TVETA. It is expected that this TVETA will use "Guideline for Practical Lesson Improvement". To utilize "Guideline for Practical Lesson Improvement" at TVETA, it is important to understand the differences between technical education in Japan and Egypt. For this reason, the Project has prepared and provided a report on the education in the upper secondary schools (specialization: industry) in Japan, including a lot of information about teachers in particular. It is expected that the report will be used by those involved in the establishment of TVETA.

## **(5) EC1 and SC**

In the Project, the JCC was not established, and reports were made to the EC1 and the SC. During the project period, the Project reported at the SC and EC1 in Table 3-18. The ninth EC1 meeting scheduled for October 31, 2018, was canceled, but the number of meetings continued to be counted.

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<sup>17</sup> The five pillars are: 1. Transformed Quality of Technical Education, 2. Transformed Relevance of Technical Education by Transferring to Competency-based Curricula, 3. Transformed Teachers through Training & Qualification, 4. Transformed Schools through Employer Engagement & Work-based Learning, and 5. Transformed Image of Technical Education through Changing Social Perception.

**Table 3-18 Report History at SC and EC1**

<b>Dates</b>	<b>Category</b>
June 6, 2017	Sixth EC1
October 8, 2017	Seventh EC1
March 13, 2018	Eighth EC1
March 21, 2018	Third SC
August 13, 2018	Fourth SC
October 31, 2018	Ninth EC(Cancelled)
June 11, 2019	Fifth SC
August 6, 2019	Tenth EC12
April 4, 2021	Sixth SC1

Source: JPT

### 3.6 Activities for Overall Goal

The overall goal “The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt” has the following two indicators.

- 20 technical secondary schools have introduced the model activities in electrical & electronics and mechanical departments.
- 70% of private companies that employ graduates from the technical secondary school that have introduced the model activities are satisfied with the graduates.

The Project conducted activities with this in mind.

#### Dissemination by Mudiriya and Idara

Port Said Mudiriya and Idara conducted a seven-day training for seven technical secondary schools (including three Pilot Schools) in Port Said governorate in January-February 2019 on its budget<sup>18</sup>. In addition, in October 2019, the Guideline training was provided to 13 technical secondary schools (including three Pilot Schools) in Port Said governorate. Kalyoubia Mudiriya and Idara instructed model activity introduction to 10 schools by sharing the Project model activities and their experiences of training in Japan.

#### Cascade training by one New Model School (School EA)

Mechanical department teachers at one New Model School (School EA) who attended skills training by the Japanese expert provided skills training to mechanical department teachers of School O in December 2019 and mechanical department teachers of School ES in August-September 2021 under the supervision of the Japanese expert. Electric department teachers of School EA also provided skills training to electric department teachers of School ES in August-September 2021.

One of the pillars of TE2.0 is to strengthen teachers’ capacity, and MOETE plans to develop master trainers through TVETA and to establish sectoral lighthouse schools, the Centers of Competence. This trial skills training from teachers of one New Model School to teachers at other target schools would be a precursor to this plan.

<sup>18</sup> The training was composed with seven contents; 1) safety, 2) time management, 3) disciplines, 4) 5S, 5) career guidance, 6) establishment of training and quality department in schools, and 7) evaluation.

### Webinar for disseminating the project achievement

To disseminate the achievements of the introduction of Japanese-style technical education in Egypt, a total of nine webinars were conducted in 2020 and 2021, with a total of about 850 participants. In the webinars held from September to December 2020, teachers from each Pilot and New Model School presented their experiences, know-how, and achievements of the model activities. Five local webinars were held for teachers at the neighboring technical secondary schools of the Pilot and New Model Schools (309 participants), and two webinars were held for teachers at technical secondary schools and officials of MOETE and regional education offices nationwide (251 participants). In December 2021, two nationwide webinars were held (283 participants)<sup>19</sup>. Teachers from the Pilot and New Model Schools mentioned the achievements of the activities in the pilot department and the dissemination of the activities to other departments, as well as the development of model activities to other schools. In the questionnaire survey conducted after the webinar, the satisfaction level of the participants was very high as shown in Table 3-19.

**Table 3-19 Level of Satisfaction with Webinar**

Question	Type of Webinar	Yes, very much	Yes	Not so much	Not at all
Were you satisfied with the webinar?	Local (2020)	48%	46%	5%	1%
	Nationwide (2020)	62%	36%	1%	0%
	Nationwide (2021)	67%	30%	3%	1%
Do you want to join the next webinar?	Local (2020)	53%	43%	3%	1%
	Nationwide (2020)	61%	37%	2%	0%
	Nationwide (2021)	77%	21%	3%	1%

Source: JPT

Many participants commented that the webinar provided them with practical knowledge and that they would like to introduce Japanese-style technical education in their schools. There were also questions such as “Is it possible to apply the Japanese style technical education in other departments?” and “Is it possible to apply the Japanese style technical education in schools without sufficient resources?”. In response, the Project explained that the feature of “Guideline for Practical Lesson Improvement” is showing instruction methods (repetitive practice and repetitive instruction) that can be applied universally regardless of department, and how to devise them with resources available at each school. In addition, for teachers at Pilot Schools and New Model Schools, presenting their achievements probably enhanced their motivation.

Since there were many requests from the participants to distribute “Guidelines for Practical Lesson Improvement”, the Project uploaded the Guideline on the Project Facebook page. It is expected that the website operated by MOETE will be utilized for further dissemination of Japanese-style technical education.

<sup>19</sup> More than 1,000 people registered for the webinar. The archive of YouTube streaming for registered people was watched about 450 times as of January 2022.

## 4. Achievements of the Project

As described in Chapter 3 (Activities 1-5, 2,5 and 4-8), the Project collaborated with each school to conduct baseline, monitoring, and endline surveys to measure the achievement of the PDM. In this chapter, the Project reports on the achievement of the project purposes and each output in line with the PDM, mainly using the results of the endline survey. Table 4-1 shows the list of achievement levels for the project purpose and each output. The achievement level of Output 1, Output 2, and Output 4 is judged to be high. On the other hand, the achievement level of Output 3 is judged to be relatively high as it was relatively underachieved due to the COVID-19 outbreak. As a result of expected outcomes being achieved in each Output, the project purpose is highly achieved.

**Table 4-1 Achievement Level of Project Purpose and Outputs**

Narrative Summary	Achievement Level
Project Purpose: The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school.	High
Output1. School management at pilot schools is improved through introducing Japanese style school management systems.	High
Output2. Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.	High
Output3. Local companies and pilot schools are cooperating with each other.	Relatively high
Output4. New model schools that introduce Japanese style technical education are in operation.	High

Source: JPT

The subsequent sections will explain the rationale for the results in the above table.

### 4.1 Outputs and Indicators

#### (1) Output 1

Table 4-2 shows the achievement level of the three indicators of “Output1. School management at pilot schools is improved through introducing Japanese-style school management systems”. The achievement level was high for all three indicators. The “achievement rate” used in the table is calculated based on JICA’s evaluation criterion of “data in the endline survey divided by the target value of the indicator”. The same applies to the subsequent tables.

**Table 4-2 Achievement Level of Each Indicator in Output 1**

OVI	Achievement Level	Reason
1-1. 90% of teachers start lessons on time at pilot schools.	High	93% (achievement rate 103%) in the practical lessons and 99% (achievement rate 110%) in the theoretical lessons were achieved in the endline survey.
1-2. 90% of students are rightly seated in a classroom/ laboratory at the starting time of the lessons at pilot schools.	High	87% (achievement rate 97%) in the practical lessons and 91% (achievement rate 101%) in the theoretical lessons were achieved in the endline survey <sup>20</sup> . In particular, the rate for the practical lessons showed

<sup>20</sup> Among four Pilot Schools, the rate of School T was lower (average of all departments: 75% in the practical lessons) as the rate at newly added departments was lower. As described in section 3.1.4 (3), time management of students at the newly added departments was significantly improved from the baseline regardless of the short periods of input, but the PDM target was not achieved.

OVI	Achievement Level	Reason
		a significant improvement, with a 52-percentage point improvement from the baseline (35%).
1-3. Achievement reports based on the guidelines have been submitted to Idara / Mudiriya / MOETE annually.	High	All schools have submitted annually after the 2018/2019 school year.

Source: JPT

In Output 1, the initial target for improvement was discipline in general. However, time management (TM), which was most important to the partner companies and most difficult for schools to improve, was made a priority. “Guideline for Practical Lesson Improvement” recommended four model activities: a) introduction of five-minute breaks, b) display of timetables, c) installation of wall clocks and d) introduction of fully automatic bell system. In September 2019, four Pilot Schools completed the introduction of all of these activities except for the installation of wall clocks, which were only partially introduced. After the 2020/2021 school year, when shortened classes were introduced due to the COVID-19 outbreak, the five-minute break became difficult to be implemented in Schools A and P and was temporarily discontinued. However, as a result of the introduction of each model activity, the punctuality rate of teachers increased (OVI 1-1), which set a good example for students, and the punctuality rate of students also increased (OVI 1-2).

## (2) Output 2

Table 4-3 shows the achievement level of the four indicators of “Output2. Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools”. The achievement level was high for all four indicators.

**Table 4-3 Achievement Level of Each Indicator in Output 2**

OVI	Achievement Level	Reason
2-1. 30% of students’ products are graded as “good” by Japanese standard assessment at pilot departments.	High	The average rate of products graded as “good” was 59% in the endline survey (achievement rate: 197%).  By department, the rate of products graded as “good” was 37% in the electronics department, 6% in the mechanical department, 100% in the electrical department, 75% in the computer department, 50% in the RMG department, and 83% in the decoration department, exceeding the target of 30% in all departments except the mechanical department. The rate of products graded as “good” was particularly high in the pilot departments added during the extension period (electricity, computer, RMG, and decoration). In addition, all departments, including the mechanical department, improved from the baseline.
2-2. 95% of students properly wear clothes in the workshop according to the safety standard of the practical lessons at pilot departments.	High	The average of each department was 97% in the endline survey (achievement rate: 102%).

OVI	Achievement Level	Reason
2-3. 95% of tools and materials are properly restored after use at the end of the practical lessons at pilot schools.	High	The average of each department was 100% in the endline survey (achievement rate: 105%).
2-4. Achievement reports based on the guidelines have been submitted to Idara / Mudiriyya / MOETE annually.	High	All schools have submitted annually after the 2018/2019 school year.

Source: JPT

In Output 2, the Project instructed teachers in the Guideline training and followed up their lessons with “Guideline for Practical Lesson Improvement”, which includes “repetitive practice and repetitive instruction” as teaching methods, with the aim that students can acquire three of the four main competencies, PR, SB, and 3S, in their practical lessons.

To improve PR, skills lacking among teachers were strengthened through the provision of skills training. In addition, as a result of the Guideline training provided to teachers, teachers began to adopt the teaching of “basic steps” (1. check requirements, 2. work, and 3. confirm results). Teachers began to adopt a model flow for explaining to students: 1) teacher shows demonstration, 2) let students work, and 3) teacher observes if students work correctly and give necessary instructions. As a result, Pilot Schools achieved 59% in the average rate of products graded as “good”. There were varieties in achievement in each department as shown in Table 4-3. The rate of the mechanical department of School O was 6% in the endline survey. This is probably due to the large number of students per practical teacher in the mechanical department of School O. In the mechanical department of School O, each topic is assigned to a teacher, thus, there was only one teacher taught the hand-finishing topic that was evaluated. Therefore, the number of students per teacher exceeded 30 for the hand finishing topic. On the other hand, the average number of students per teacher in other Pilot Schools’ electronics department was 13, a difference of about 2.5 times. The project recommends a small-group rotation system to increase the number of hours of students work, and small-step instruction to experience a larger number of basic steps. This small-step instruction is more effective when the teacher checks the students’ work frequently, but this is a weak point in the mechanical department of School O, where there are many students per teacher, and therefore the effect was insufficient.

In SB, safety rules in the workshops were defined and posted so that students could repeatedly check what is the correct safety behaviors, which promoted students’ habituation.

3S rules were also defined in each Pilot School and posted in its workshops, and efforts were made to teach and implement 3S with minimal cost. This promoted the habituation of the students’ behavior.

### (3) Output 3

Table 4-4 shows the achievement level of the three indicators of “Output3. Local companies and pilot schools are cooperating with each other”.

**Table 4-4 Achievement Level of Each Indicator in Output 3**

OVI	Achievement Level	Reason
3-1-1. (Dual system) 4 collaborative activities per year are implemented with local private companies, such as	Relatively high	The number of activities in the 2019/2020 school year was four, and the indicator was achieved.

OVI	Achievement Level	Reason
training, internship programs, study visits to local companies.		However, at the time of the endline survey in the 2020/2021 school year, only one activity had been conducted (achievement rate: 25%), which was an underachievement due to the COVID-19 outbreak.  The activities were resumed actively in the 2021/2022 school year again.
3-1-2. (Conventional system) 6 collaborative activities per year such as training, internship programs, study visits to local companies.	Relatively high	The number of activities in the 2019/2020 school year was six and the indicator was achieved.  However, at the time of the endline survey in the 2020/2021 school year, only one and half activities had been conducted (achievement rate: 25%), which was an underachievement due to the COVID-19 outbreak.  The activities were resumed actively in the 2021/2022 school year again.
3-2. 50% of graduates' placement records after six months of graduation are traced and kept by the pilot schools every year.	High	In the endline survey for graduates of the 2021/2022 school year <sup>21</sup> , information was collected from 68% of the graduates (achievement rate: 136%).

Source: JPT

In Output 3, activities were implemented to help teachers themselves learn about the needs of companies and communicate them to students to motivate students to engage in the repetitive practice. School management, WTUs, and teachers in each department cooperated in various collaborative activities. In the 2019/2020 school year, collaborative activities were actively conducted: four activities at Pilot School Dual system and six activities at Pilot School Conventional system, achieving the PDM target. However, after the COVID-19 outbreak around February 2020, it became difficult for the schools to implement the activities due to some irregularities such as semesters being shortened, staggered attendance, exams being implemented during the semester. As a result, the number of activities in the 2020/2021 school year at the endline survey was low: one at the Dual system and one and a half at the Conventional system. However, the implementation of activities became active again in the 2021/2022 school year, and Pilot Schools expanded the activities to other departments. Thus, as the collaborative activities with companies are successfully introduced, the achievement level is judged to be relatively high (OVIs 3-1-1, 3-1-2).

#### (4) Output 4

Table 4-5 shows the achievement level of the three indicators of “Output4. New model schools that introduce Japanese style technical education are in operation”.

**Table 4-5 Achievement Level of Each Indicator in Output 4**

OVI	Achievement Level	Reason
4-1. 90% of teachers start lessons on time at the new model school.	High	100% (achievement rate 111%) in both practical lessons and theoretical lessons were achieved in the endline survey.

<sup>21</sup> The Project has used the school's student database to collect career information on graduates through telephone interviews.



OVI	Achievement Level	Reason
4-2. 90% of students are rightly seated in a classroom/laboratory at the starting time of the lessons at the new model school.	High	100% (achievement rate 111%) in both practical lessons and theoretical lessons were achieved in the endline survey.
4-3. 30% of students' products are graded as "good" by Japanese standard assessment at the pilot department of the new model school.	High	The average of each department was 81% in the endline survey (achievement rate: 270%).  By department, the rate of products graded as "good" was 61% in the mechanical department (School EA and School ES) and 100% in the electrical department (School ES).
4-4. 90% of students properly wear clothes in the workshop according to the safety standard of the practical lessons at the pilot department of the new model school.	High	The average of 100% for each department was achieved in the endline survey (achievement rate: 110%).
4-5. 95% of tools and materials are properly restored after use at the end of the practical lessons at the pilot department of the new model school.	High	The average of 100% for each department was achieved in the endline survey (achievement rate: 105%).
4-6. 4 collaborative activities per year are implemented with local private companies, such as training, internship programs, study visits to local companies.	Moderately high	The number of activities in the 2019/2020 school year was three (achievement rate: 75%).  However, at the time of the endline survey in the 2020/2021 school year, only one activity had been conducted (achievement rate: 25%), which was an underachievement due to the COVID-19 outbreak.  The activities were resumed actively in the 2021/2022 school year again.
4-7. 50% of students for whom the new model school keeps records of their career development information (such as department, ID number, name, address, contact numbers, and target companies/colleges, etc).	High	50% (achievement rate 100%) for the 2021/2022 school year.
4-8. 5 training programs are conducted based on the guidelines for teaching and management level staff, of the new model school.	Relatively high	Several training programs were conducted every school year as described below. 2018/2019: Five internal training programs (achievement rate: 100%) 2019/2020: One internal Guideline training and one skills training for mechanical department teachers of School O (achievement rate: 40%) 2020/2021: Two webinars for disseminating result to other schools and two skills training programs for mechanical and electricity department teachers of School ES (achievement rate: 80%)

Source: JPT

Output 4 aimed to help New Model Schools in Egypt to become better model schools by supporting them to introduce the same model activities as in Outputs 1 to 3.

In TM, four model activities (introduction of five-minute breaks, display of timetables, installation of wall clocks, and introduction of a fully automatic bell system) were introduced at a high level. As a result, both the punctuality rate of teachers (OVI 4-1) and the punctuality rate of students (OVI 4-2) reached a high level of 100% (achievement rate: 111%).

In PR, skills lacking among teachers were strengthened through skills training, and basic steps (1. check requirements, 2. work, and 3. confirm results) were introduced through the Guideline training. At New Model School, teachers had a wide range of discretion, and teachers were able to plan practical lessons according to the school environment (number of teachers, materials, and equipment). Therefore, the small group practical lesson system recommended in “Guideline for Practical Lesson Improvement” was well incorporated, which allowed students to spend more time on their work and allowed them to conduct repetitive practice. This led to a high “good” rate (high hard skills) of students' products (OVI 4-3).

In SB, both of two New Model Schools provided students with work uniforms, and by thoroughly instructing students at roll call before the start of practical lessons as indicated in “Guideline for Practical Lesson Improvement”, students’ wearing of work uniforms became a habit (OVI 4-4).

3S rules were also defined in each school and posted in its workshops, and efforts were made to teach and implement 3S at minimal cost. This promoted the habituation of 3S among students (OVI 4-5).

Although New Model Schools provide dual education (factory training), the schools aimed to increase students’ aspirations by providing more opportunities outside of the daily dual education through collaborative activities with companies. In the 2019/2020 school year, School EA conducted three activities (achievement rate: 75%). However, due to the impact of the COVID-19 outbreak that began in February 2020, it became difficult to implement activities during the 2020/2021 school year, and only one activity was conducted (achievement rate: 25%). However, in the 2021/2022 school year, the implementation of activities became active again, and four activities had been conducted as of November 2021. Thus, as the collaborative activities with companies has been successfully introduced, the achievement level is judged to be moderately high. (OVI 4-6).

By collecting information on the career aspirations of students, the Project aimed to help teachers understand the aspirations of students and use this information in their instruction. In the 2021/2022 school year, New Model Schools collected information from 50% students (achievement rate: 100%), but the breakdown was 100% for School EA and 0% for School ES. School ES was unable to implement this activity because the implementation period was only two months, from October to November 2021, but they are eager to collect information on their career prospects (OVI 4-7).

Following the training in Japan conducted in September 2018, School EA conducted five school-based training sessions for information sharing in the 2018/2019 school year (achievement rate: 100%). In the 2019/2020 school year, School EA conducted a skills training program for mechanical teachers of School O as well as an internal Guideline training (achievement rate: 40%). Furthermore, informal information exchange such as sharing of practical examples of model activities on SNS among teachers has been conducted. In the 2020/2021 school year, School EA had presentations in the two webinars that the Project held for disseminating results to other schools, and conducted two skills training programs for mechanical and electricity department teachers of School ES (achievement rate: 80%). Since School EA conducted several training

programs not only at their school, but also for other schools in every school year, the achievement level is judged as relatively high (OVI 4-8).

## 4.2 Project Purpose and Indicators

Table 4-6 shows the achievement level of the three indicators of “Project Purpose: The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school”. The achievement level is high for all four indicators.

**Table 4-6 Achievement Level of Each Indicator in Project Purpose**

OVI	Achievement Level	Reason
1. Guidelines for introducing Japanese style technical education are approved by MOETE for expansion.	High	“Guideline for Practical Lesson Improvement” for the introduction of Japanese-style technical education was approved by MOETE in August 2019 and signed by the Minister of Education in January 2020.
2. 70% of students are satisfied with the Japanese-style classes given at the technical secondary schools that have introduced the model activities (i.e. a) whether the practical lessons are easy-to-follow and b) whether they think they could be equipped with basic hard and soft skills at practical lessons).	High	In the endline survey, 71% of the students were satisfied with Japanese-style classes at the technical secondary schools where the model activities were implemented <sup>22</sup> (achievement rate 101%).
3-1. (Dual system) 80% of graduates who sought for jobs, have obtained those at the technical secondary schools that have introduced the model activities.	High	In the endline survey, the rate of graduates who sought jobs, thereafter, have obtained those at the technical secondary schools that have introduced the model activities was 77% (achievement rate: 96%) for the dual system and 67% (achievement rate:335%) for the conventional system. New Model Schools are not included in this indicator, but at School EA where the first graduates graduated in June 2021, 114 (84%) out of 136 graduates were employed or in the process of employment, and 17 (12%) went on to higher education.
3-2. (Conventional system) 20% of graduates who sought for jobs have obtained those at the technical secondary schools that have introduced	High	

Source: JPT

The Project carried out activities for each output to establish model activities that can improve student competency. Model activities that can improve students’ competency were established and approved by MOETE as “Guideline for Practical Lesson Improvement” (OVI 1). As a result, student satisfaction increased (OVI 2), and the rate of graduates who sought for jobs have obtained those increased (OVI 3-1 and 3-2).

Webinars were held in 2020 and 2021 to disseminate the achievements of the project, and many participants expressed their desire to introduce Japanese-style technical education in their schools,

<sup>22</sup> This indicator takes the average of the following three questions: 1) Do you understand the contents of the practical lesson easily? 2) Do you think that you could gain with skills at practical lesson? and 3) Do you think that the skills you gained at practical lesson be useful in the future?

indicating a high level of interest in “Guideline for Practical Lesson Improvement”. The training package, including “Guideline for Practical Lesson Improvement”, is available on the project Facebook page, and the training package will be posted on the website operated by MOETE for use.

### **4.3 Others**

#### **(1) Environmental and Social Considerations**

According to JICA’s guidelines, this project is categorized as Category C in terms of environmental and social considerations, so there is no need to give special consideration to this item.

#### **(2) Considerations on Gender/Peace Building/Poverty Reduction**

Of Pilot Schools, Schools A, P, and T are girls’ schools; School O is a co-educational school, but only boys are enrolled in the pilot department, the mechanical department. Two New Model Schools are boys’ schools. By the end of the project, no gender differences appeared in the results of activity disincentives and PDM indicators.

## 5. Project Evaluation and Lessons Learned

### 5.1 Results of Review based on DAC Evaluation Criteria

#### Relevance: High

Egypt has a long-term Sustainable Development strategy :Egypt’s Vision 2030, and one of the mid-term goals is to reduce the unemployment rate to below 10%. In this context, the EJEP was signed in February 2016, and it was agreed to introduce and support the deployment of Japanese-style education in each educational stage from early childhood education to higher education. This Project helps develop human resources in the field of technical education through the dissemination of model activities for improving practical lessons concerning Japanese-style technical education, which is highly relevant to development policy.

MOETE has also launched TE2.0 to transform technical education starting in the 2019/2020 school year. TE2.0 consists of the following five pillars.

- T1. Transformed Quality of Technical Education
- T2. Transformed Relevance of Technical Education by Transferring to Competency-based Curricula
- T3. Transformed Teachers through Training & Qualification
- T4. Transformed Schools through Employer Engagement & Work-based Learning
- T5. Transformed Image of Technical Education

The Project contributes to all the pillars and therefore the relevance is very high. In particular, the potential to contribute to T3 and T1 is high.

For T3, the Project developed “Guideline for Practical Lesson Improvement” and provided the Guideline training to teachers at Pilot and New Model Schools. The Project also strengthened their hard skills through skills training. In addition, the Project had been following up on the implementation of the Guideline in their lessons. Furthermore, the report “The Education in Upper Secondary School (Specialized Course: Industry) in Japan” describes the quality assurance of teachers in detail, which will be useful information for MOETE’s plan to establish a teacher certification system.

In T1, MOETE plans to establish a Center for the Enhancement of Quality Assurance of Technical Education (CEQAT) to standardize and assure the quality of technical education secondary schools. The Project has developed “Competencies that schools and teachers can acquire by introducing ‘Guideline for Practical Lesson Improvement’, and their evaluation”. By incorporating it into the school standard to be developed by CEQAT in the future, it is possible to develop a system that can introduce “Guideline for Practical Lesson Improvement” to various schools.

Regarding T2, while the Competency-Based Curriculum (CBC) in Egypt contains detailed descriptions of what students should learn, there is a little description of how to teach it. Considering the teaching capacity of Egyptian teachers, it is necessary to indicate the teaching methods to improve the effectiveness of the practical lessons. “Guideline for Practical Lesson Improvement” of the Project can contribute to teachers’ effective teaching of CBC by providing detailed information on teaching methods for hard and soft skills that are generic to any department, referring to the Japanese style.

### Coherence: High

As one of the projects under the EJEP umbrella, this Project is coherent in that it refers to Japanese-style education along with other projects such as the technical cooperation project “The Project for Creating Environment for Quality Learning (Tokkatsu Project)”. In addition, the two projects have also been sharing information, as there have been overlaps in information gathering and lessons learned in the implementation of the project in MOETE.

The technical education sub-sector in Egypt is supported by the European Union (EU), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and the U.S. Agency for International Development (USAID), etc., and this Project has been coordinated with these development partners. For example, the activities of this project were similar to those of GIZ’s Employment Promotion Project, which targets career guidance. During the 2018/2019 school year, the Project had two consultations with GIZ and adjusted the structure of the project’s “Guideline for Practical Lesson Improvement” to emphasize the requirements for teachers to know the needs of companies. This was adjusted so that the targets of both sides would not overlap. In addition, the EC1 PMU co-director participated in the donor meetings, and information was collected through him. EU, GIZ, and USAID are involved upstream in the TE2.0 measures promoted by MOETE, and information has been collected for collaboration.

### Effectiveness: Through the implementation of the project, the expected outcomes were achieved beyond the plan.

All four indicators of the project purpose “The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school” were achieved, as summarized in Section 4.2. Although there were negative impacts due to the COVID-19 outbreak especially on the model activities related to Output 3, the project activities were carried out as planned. As a result, the achievement level of “OVI 2 of the Project Purpose: rate of students satisfied with the Japanese-style classes given at the technical secondary schools that have introduced the model activities” was high, it is believed that the introduction of the model activities in the Pilot and New Model Schools led to the improvement of students’ competencies and their satisfaction. Furthermore, the achievement level for “OVI 3: rate of graduates who sought for jobs, have obtained those at the technical secondary schools that have introduced the model activities” was also high. The achievement rate for conventional schools was particularly high at 335%. Although not included in OVI, 84% of the graduates of one New Model School (School EA) were employed or in the process of finding employment, and 12% were going on to higher education, resulting in a very high achievement rate of 96% of graduates having a confirmed career path.

### Efficiency: The project inputs (costs and duration) were generally efficient about the project outputs. (Guideline: over 100% to 125% of plan)

The project period was from April 2017 to December 2021 (56 months), compared to the original plan of April 2017 to December 2020 (44 months), resulting in 127% of the plan. The project cost was 528 million yen against the planned estimate of 500 million yen (based on the preliminary evaluation sheet), which is 106% of the plan. This increase in the project period and project cost is due to the extension of the project period for further dissemination of the project results and promotion of sustainability. This is 106% of the original budget and 127% of the original project period, and all project purpose and outputs have been achieved, so it is judged as the above evaluation.

### Impact: High

At the time of project completion, the overall goals have been largely achieved or are close to being achieved, and the impact of this project is high. OVI “20 technical secondary schools have

introduced the model activities in electrical & electronics and mechanical departments” was achieved at the completion of the project with the Port Said Mudiriyya and Kalyoubia Mudiriyya guiding the introduction of model activities to more than 20 technical secondary schools in their areas of jurisdiction. Furthermore, the national-level project results dissemination webinars conducted by the project in 2020 and 2021 attracted more than 300 participants from outside the pilot areas, and the participants were highly motivated to introduce the model activities. These activities are expected to contribute to the achievement of the overall goals. Regarding the OVI “70% of private companies that employ graduates from the technical secondary school that has introduced the model activities are satisfied with the graduates”, the Project interviewed three partner companies in the endline survey, and all three companies answered that they were satisfied (see Section 6.1 for details).

#### Sustainability: Moderate

**Policy and Institution:** The results of this project are consistent with MOETE’s policy TE2.0. Thus, sustainability is high in terms of policy since TE2.0 has set 2030 as its target year. To enhance sustainability, collaboration with other donors involved in TE2.0 is necessary.

**Organization and Structure of the Implementing Agency:** In TE2.0, the Center of Competence will be the sectoral hub for dissemination. All the target schools of the Project introduced the model activities and improved the students’ competencies, but among them, School EA and School A actively implemented the model activities and achieved high results. Therefore, it is recommended that these two schools become the hub of dissemination, the Center of Competence. In TE2.0, CEQAT will be established to standardize and assure the quality of technical secondary schools. Therefore, it is recommended that the school standards to be developed in the future by CEQAT incorporate “Competencies that schools and teachers can acquire by introducing ‘Guideline for Practical Lesson Improvement’, and their evaluation” developed by the project. It is also recommended that a system for monitoring by a third party be established, but the challenge is to promote the realization of this system.

**Skill and Experience of Implementing Agencies:** School A and New Model Schools that have achieved a high achievement level in introducing the model activities will serve as good examples for other schools. Teachers of these schools with practical experiences will be candidates to serve as facilitators for other schools. The Project has developed a training package, which can be used to implement the Guideline training.

**Implementing Agency’s Finance:** The possible ways of disseminating the model activities are: 1) dissemination from project target schools to other schools, and 2) central training at TVETA. 1) was tried during the project period. Dissemination training was conducted from School EA to School ES during the extension period. Funding was secured through a public-private partnership in which School ES covered the expenses for training participants and School EA covered the expenses for trainers and part of the training activity costs. In addition, the results dissemination webinar conducted by the Project showed that efficient dissemination can be done with a low budget. The Project has been discussing the sustainability of the model activities with MOETE since December 2019, and it is hoped that MOETE will use these examples as a reference to consider a sustainable skills training model and expand the model to other schools.

## 5.2 Changes of Risks and Actions for Mitigation – Actions by JICA and the Government of Egypt

In this section, risk factors throughout the project period and the measures taken to mitigate them are described item by item.

### PMU personnel

#### <Risk/Challenge>

The first PMU director left in July 2017, at the beginning of the Project, and decision-making delays became an issue; a new PMU director was appointed in March 2018, but her involvement in the Project decreased after October 2018 due to her busy schedule.

#### <Action taken and results>

The Project requested MOETE to assign a PMU deputy director upon the leaving of the first PMU director, and the Project Consultation Mission dispatched in February 2019 proposed to assign a PMU deputy director due to the busy schedule of the new PMU director. Following this proposal, MOETE assigned a deputy director of PMU in March 2019, and communication between the project and PMU has improved.

#### <Risk/Challenge>

The training costs for the project implementation were to be borne by the Egyptian side (Mudiriyya) under the PDM. However, the Egyptian side was not able to secure a budget at the beginning of the project.

#### <Action taken and Results>

Port Said Mudiriyya and Kalyoubia Mudiriyya secured their budgets to implement the dissemination activities from 2019. This resulted in the dissemination of results to more than 20 schools in total.

### Improving and sustaining the motivation of Pilot School principals and teachers

#### <Risk/Challenge>

In Egypt, it was customary for teachers to receive incentives for performing additional work outside of their normal duties, which was a hindrance to project-based activities. Also, the fact that Output 2 targets only one pilot department in each school posed a risk of creating a sense of inequity within each Pilot School.

#### <Action taken and results>

At the beginning of the project, MOETE considered and planned two options: 1) to enable departments other than the pilot department in Output 2 to adopt the model activities, the supervisor in charge of each department will accompany the Project to learn the model activities and prepare to disseminate them to their departments, and 2) integrate several schools in Port Said city to make a school which has only pilot department (electronics department) to solve the dissatisfaction of the electronics department teachers that their workload was much larger than that of other departments. The latter proceeded to the point where School P temporarily became an electronics-only school and prepared to accept students, but this did not happen due to multiple factors, including the departure of the PMU director in July 2017. Therefore, the Project mitigated the risk by conducting activities during working hours only and setting up progress meetings to share the monitoring results with other department teachers.



### Impact of the spread of the COVID-19 outbreak on the project activities

#### <Risk/Challenge>

The impact of the COVID-19 outbreak was manifold: all Japanese experts returned to Japan in March 2020, and the Project was conducted remotely until January 2021. This posed risks such as reduced efficiency of project activities. Japanese experts resumed their travel in February 2021, but given the risk of infection, the Project used both face-to-face instruction locally and remote instruction from Japan. In Egypt, the instruction time decreased in schools<sup>23</sup>, and the risk of decreased opportunities for “repetitive practice and repetitive instruction” that the Project recommended became high.

#### <Action taken and results>

In the 2019/2020 school year, MOETE launched a technical education YouTube channel, delivered TV programs, published educational materials in newspapers, utilized online platforms, and introduced a learning management portal to continue learning. Changes were also made to the method and timing of the promotion examinations.

JICA made efforts to resume travels of Japanese experts by securing medical institutions, etc., leading to the resumption of travel of Japanese experts from February 2021.

The Project flexibly changed the activity plan according to the situation. The skills training was changed to online content, and the dissemination seminars were switched to non-face-to-face webinars. In addition, local trainers were used for the skills training conducted during the extension period. Furthermore, at School T, which was the main target of input for the extended period, deterioration in attendance was observed in April 2021. The Project conducted a brief survey to determine the cause of the deterioration. Subsequently, in October 2021, the Project collaborated with School T to conduct activities to ensure a safe environment for students to learn in the COVID-19 outbreak, such as providing preventive measures supplies, supporting activities to strengthen communication between the school and parents, and monitoring. As a result, the attendance rate for practical lessons at School T recovered to the level before the spread of the COVID-19 outbreak.

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<sup>23</sup> In the 2019/2020 school year, school was closed from mid-March 2020; in the 2020/2021 school year, 1) school started about a month later than usual, in mid-October; 2) the second semester was shortened; 3) class hours were reduced; and 4) distributed school attendance was implemented. In the 2021/2022 school year, school opened in mid-October and class hours were shortened.

### 5.3 Lessons Learned

#### (1) Challenges and lessons learned in implementing and disseminating model activities

- **Necessity of training package:** This Project refers to “Japanese-style technical education”, but no document or book is defining Japanese-style technical education in Japan, so the definition was drafted by the Project. After drafting, the Project conducted trials at Pilot Schools, made revisions based on the results, and completed the definition in “Guideline for Practical Lesson Improvement”. The dissemination of the Guideline to other schools conducted by the Mudirriya before the completion of the Guideline did not always accurately convey the model activities, which posed a challenge. With the completion of the Guideline, the introduction of the model activities became more efficient and effective. To motivate teachers to introduce the model activities, it was found that more easy-to-understand visual materials and good examples from other schools were necessary. Thus, the need for a training package in model dissemination became apparent.
- **Effectiveness of the model activities dissemination webinar:** In the dissemination webinars, representatives from Pilot Schools and New Model Schools presented their experiences, know-how, and challenges they faced in implementing the model activities. According to the post-event questionnaire, the participants were highly motivated to introduce the model activities. In addition to the training, it is thought that the dissemination of the Guideline will be promoted by sharing good examples of the introduction of model activities.
- **Impact of school management discretion on the implementation of model activities:** According to the endline survey, compared to Pilot School, New Model Schools had a better implementation of model activities, the teachers were better role models for the students, and the students’ knowledge, skills, competencies, and satisfaction were higher. For example, in School EA (New Model School) was free to change the teaching order of the practical lesson topics, so the mechanical department introduced a small group system, and each group could be taught a different topic at the same time. This greatly reduced the number of students per piece of equipment and dramatically increased the amount of time students can work. In Pilot Schools, such a flexible change in the order of teaching topics was not possible, and small groups were only introduced to the extent possible within the existing practical lesson plan. This indicates that the discretion of the school management affects the ease of introducing the model activities.
- **Significance of introducing activities in all departments and necessity of monitoring by a third party:** Before the extension period, School EA and School A made the fastest progress in introducing the model activities. The two schools were characterized by the fact that they independently realized the spread of the model activities to all departments at an early stage. In the early stages of the Project, MOETE was concerned that introducing the model activities to only the pilot departments would create inequity among the departments and make school management difficult. Therefore, during the extension period, the model activities were introduced in all departments of one Pilot School (School T) and an additional New Model School (School ES). The fact that sufficient results were obtained despite the short period used for the extension suggests that it was highly significant for all teachers to engage in the improvement activities at the same time, as the sense of inequity between departments was eliminated and the teachers in each department understood the necessity of introducing the model activities. On the other hand, it is also noteworthy that both School EA and School A had a close relationship with a third-party, a partner company: the representatives of the partner company at School EA was directly involved in the school management, and the partner

company at School A monitored the model activities through school visits and dual factory training. This suggests that the introduction of activities in all schools and monitoring by a third party are also important.

- **Toward the sustainability and dissemination of repetitive practice:** Although the model activities have been established, there are several challenges to their sustainability and dissemination. First, there is a lack of teacher skills (hard skills). Initially, the Project started with the assumption that teachers would have a minimum level of basic knowledge and skills but realized early on that this assumption was incorrect and put more focus on skills training. As a result, the hard skills of the teachers in the pilot departments improved significantly, and the Project was able to introduce model activities. This needs to be strengthened when disseminating to other departments and schools, which will be a challenge. Second, there is a shortage of equipment. The Project supported the pilot departments by providing them with equipment, but these will be also necessary for disseminating to other schools and departments. Third, there is a serious shortage of consumable materials. Repetitive practice requires the students to practice a lot, even if it consumes a lot of materials and other consumables. For example, in the electronics department, due to budget constraints, substrates and elements were being reused, and this was preventing the students from working correctly. The Project solved this problem by providing materials from the Project, but a stable supply of consumables materials is essential for the pilot departments to continue to practice repeatedly.

## (2) Challenges and lessons learned in project management

- **Use of local teachers with high skill:** The activities during the extension period took place under the COVID-19 outbreak. Since several Japanese experts were unable to travel to Egypt, local trainers were utilized, selected from non-Pilot School teachers with the help of MOETE. The local trainers had sufficient hard skills to train other teachers under the supervision of the Japanese experts. This enabled the local trainers to collaborate online with Japanese experts in Japan with satisfactory results. The existence of these excellent teachers was not known to the Project until the extension period. If it had been known, the way of project management could have been different. Skills training by Japanese experts is conducted based on solid skills, but the efficiency is low due to the need for interpreters. It is more efficient for Japanese experts to provide intensive training to potential teachers, and for the same teachers to train other teachers. Therefore, it is necessary to build a database of excellent teachers (currently being developed by MOETE).
- **Efforts to recover attendance and school management:** A decline in student attendance was observed in some Pilot Schools in the sample survey conducted by the eighth monitoring survey in March-April 2021 under the COVID-19 outbreak. Therefore, activities to recover the attendance rate were conducted at School T, the main target school for the extension period. Teachers, students, and parents at School T were interviewed in August to find out the causes of the deteriorating attendance rate. While teachers recognized that the school was taking sufficient measures against the COVID-19 outbreak, parents did not feel that the measures were sufficient. To address this issue, the school provided masks and other supplies to students, educated students about infection prevention, and held a parent-teacher meeting to explain these efforts. The Project provided support through the provision of supplies and monitoring. As a result of these efforts, the sample survey showed that in October 2021, the attendance rate averaged 60% in the practical lessons and 30% in the general subject lessons, a significant improvement from the second semester of the 2020/2021 school year when the attendance had dropped significantly. Especially in practical lessons, the attendance rate returned to the level before the COVID-19 outbreak. The fact that the third party was able to improve

school management and student attendance in the ordinary school through appropriate follow-up can be considered as a future reference for MOETE and Mudirriya.

- **Implementation and constraints of online skills training:** Online skills training was conducted during the COVID-19 outbreak. Lessons learned from the implementation include: 1) experts need to know the equipment at the training site to provide direct instruction remotely and efficiently, 2) when an interpreter is used, the instruction is not conveyed promptly. Therefore, safety assurance is an issue when practicing in mechanical departments, which involve the risk of serious accidents, and 3) in the case of collaboration between local trainers and Japanese experts in Japan, it is more efficient for the local trainers, who have a good grasp of the equipment in the training site, to prepare lesson plans and demonstrate them to the Japanese experts, and for the Japanese experts to instruct the local trainers.
- **Dissemination webinars:** By switching from face-to-face dissemination seminars to non-face-to-face webinars, the Project was able to expand the scale of dissemination and reduce expenses. The webinars were held seven times in 2020 and two times in 2021, with approximately 850 participants, not only from pilot Mudirriya but also on a national scale. The main expenses were only the cost of the online conference application and the venue for the webinar presenters, making it inexpensive to conduct. A questionnaire survey confirmed the high level of satisfaction among the webinar participants. In conducting the webinars, we made efforts in terms of content (software) and Internet environment (hardware). The content of the webinars was designed to 1) keep the duration of the webinar to two hours or less to keep the participants focused 2) focus on the process of achieving the outcomes in the presentations from each school to provide the know-how to the participants, and 3) use the chat function during the webinars to solicit questions from the participants for interactive communication. (On the other hand, the use of verbal questions was limited due to the difficulty of time management.). In terms of the Internet environment (hardware), the following measures were taken: 1) the webinar was delivered from the hotel to improve the Internet environment of the organizer, 2) applications with low communication capacity were selected, 3) the organizer made the main presentation, and 4) screen sharing of materials that require large communication capacity was avoided as much as possible. For future webinars, it is necessary to consider how to distribute video materials, etc., which requires a large amount of communication, and how to provide more active communication between the organizer and participants. For the dissemination of the results, it would be useful to visit schools that are implementing the model activities, and it would also be effective to conduct such tours online.

### (3) Other challenges and lessons learned

- **Collaboration with the private sector:** The Project was able to achieve significant results through collaboration with three private companies. It was also observed that monitoring by the private sector had a significant positive effect on school management. A lot of monitoring by private companies was done in School EA and School A. Both schools were proactive in introducing the model activities early on, and student' competency improvement was quick. This can be attributed to the fact that both teachers and students were in a position to fully experience the competencies required by the private sector. Some difficulties were encountered in working with the private sector. For example, the company that had dual cooperation with School A planned to expand the dual cooperation to School P and School T. Therefore, three schools were selected as Pilot Schools for the Project, but the plan was changed in October 2016, and the dual education in School P and School T ended after one year. In addition, the opening of the School EA was scheduled for September 2017 at the time R/D was signed but was postponed to

September 2018. Despite these difficulties, the positive effects of the collaboration with private companies were significant. The teachers and students were able to understand the competencies required by the companies, and the facilities, equipment, materials, and other physical resources provided by the companies had a great positive impact. Furthermore, the synergistic effect between the companies cannot be overlooked: SEWS visited the school EA to learn from its achievements, and Unicharm learned lessons from School EA through the project team.

- **Challenges in students' basic academic skills:** Major challenges were observed in theoretical learning, including mathematics and science. For example, although it was a sample observation, the Project observed several students in the electronics department at School T who were unable to perform subtraction by decreasing order. If they cannot do basic arithmetic, they will not be able to understand Ohm's law, which is the basic theory of electronics. Such basic math and science are built up from primary education, and cannot be addressed by improving only the technical secondary schools. New Model Schools and popular schools such as School A are responding to this by attracting excellent students through selective examinations, but to raise the level of the entire technical education sub-sector, it is necessary to improve mathematics and science in the entire educational field.

## 6. For the Achievement of Overall Goals after the Project Completion

### 6.1 Prospects to achieve Overall Goal

The overall goal is to be achieved three years after the project ends, i.e., around 2025. The overall goal of this project is “The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt”. Table 6-1 shows the two indicators and their achievement status.

**Table 6-1 Achievement Level of Each Indicator in Overall Goal**

OVI	Achievement Level	Reason
20 technical secondary schools have introduced the model activities in electrical & electronics and mechanical departments.	High	<p>As of 2021, more than 20 schools have been instructed to introduce model activities, so the achievement level is high.</p> <p>The Port Said Mudiriya conducted two training sessions on “Guideline for Practical Lesson Improvement” for technical secondary schools in their governorate. The first training was conducted in January-February 2019 for seven schools (including three Pilot Schools) and the second training was conducted in October 2019 for 13 schools (including three Pilot Schools). Kalyoubia Mudiriya guided 10 schools to introduce the model activities after sharing their experiences in the project’s model activities and training in Japan.</p> <p>The Project also held seven project dissemination webinars in 2020 and two in 2021. Four of these webinars were at the national level and were attended by <u>327</u> participants from outside the pilot areas. As many participants requested the distribution of the Guideline, the Guideline and its video materials are posted on the project’s Facebook page.</p> <p>These activities are expected to contribute to the achievement of the overall goal.</p>
70% of private companies that employ graduates from the technical secondary school that have introduced the model activities are satisfied with the graduates.	Ongoing	<p>Three out of three partner companies responded that they were satisfied.</p> <p>Three partner companies that the Project interviewed answered that they were satisfied with graduates<sup>24</sup>. El-Araby hired 102 graduates who graduated in June 2021, and 11 are in the process of being hired; El-Araby was particularly satisfied with the attitude, competence, and discipline of the graduates. SEWS hired 33 graduates</p>

<sup>24</sup> The three partner companies that the Project interviewed are either Japanese companies or Egyptian companies that are closely related to Japanese companies, and the four main competencies defined in “Guideline for Practical Lesson Improvement” of this Project are practiced in the corporate settings, so it is possible to properly assess the students' competencies. Although some of the graduates were employed in companies other than these three, some of the Egyptian companies do not practice the four competencies, and it is highly possible that they would not be able to provide appropriate responses, so they were not included in the online survey. Of the graduates who responded to the telephone interview (graduated in June 2021), 80 were employed, and of these, 35 were employed by companies other than the three partner companies. Although we were not able to identify all of the companies where the graduates were employed, they do not employ a large number of people like the three partner companies.

OVI	Achievement Level	Reason
		from School A in 2021 and will continue to hire them; SEWS noted that the principal and teachers meet frequently with the company and have the same mindset as the company. Unicham has hired seven graduates from School O, graduating in 2020, and will continue to hire them. Initially, 15 students were hired for an eight-month probationary period, but eight of them continued to work while pursuing higher education but found it difficult to continue working and decided to concentrate on their studies. However, Unicharm appreciated that those who continued to work are better than the previous senior staff.

Source: JPT

As mentioned above, dissemination of the model activities to 20 schools has been carried out by the Port Said Mudiriyya and the Kalyoubia Mudiriyya. In addition, in the interviews with the three partner companies conducted for the endline survey, all three companies responded that they are satisfied with their graduates. From these facts, it can be concluded that the overall goals have been achieved or are close to being achieved.

As indicated in the discussion of sustainability in Section 5.1, the policies and institutions of MOETE and the results of this Project are consistent at this time, and it is expected that the results of this project will be utilized to achieve the overall goal.

## 6.2 Plan of Operation and Implementation Structure of the Egyptian Side to Achieve the Overall Goal

The implementation structure shown in Figure 1-1 will continue to function even after the completion of this Project. Therefore, the SC, which is the highest level of this implementation structure, and the EC1, which is under the SC, will be responsible for monitoring activities toward the overall goal of this Project. In addition, the Deputy Minister of Education and Technical Education will continue to report to both committees. As such, the deputy minister will continue to be responsible for promoting activities towards the overall goal.

In addition, the EC1 PMU co-director with MOETE as her C/P continues to be dispatched. It is necessary for the EC1 PMU co-director to monitor the status of policies and initiatives such as the establishment of TVETA promptly and to collaborate with other development partners to make the results of this project sustainable. Therefore, the EC1 PMU co-director will continue to collaborate and cooperate with MOETE in its efforts to spread the model activities. The EC1 co-director expert will also provide inputs to the Egyptian government to ensure that the lessons learned from this project are utilized when the Egyptian side considers further efforts in the field of technical education after the completion of the project.

## 6.3 Recommendations for the Egyptian Side

### Establishing an environment to realize “repetitive practice and repetitive instruction”

“Guideline for Practical Lesson Improvement”, which tells how to implement “repetitive practice and repetitive instruction”, is highly effective, but the improvement of the environment by the Project supported its realization. Continuation and dissemination to other schools after project completion will also require the development of the following points.

- Teacher competency (skills): It is recommended that skills training should be standardized and in-school training should be activated.
- Consumables: Adequate supply of consumables every year is essential not only for sufficient training of all students but also for teachers to maintain their skills. It is recommended that supplies be provided through budget allocations and corporate partnerships.

#### A mechanism to promote the introduction of “repetitive practice and repetitive instruction” model activities

As mentioned in Section 5.3, interest, involvement, and monitoring by a third party are considered to be important factors in realizing “repetitive practice and repetitive instruction”. For schools with partner companies, such as New Model Schools and School A, it is necessary to explain this model activity to the partner companies and request their cooperation. For conventional schools that do not have such partner companies, other mechanisms are required: TE2.0 plans to use CEQAT for standardization and quality assurance of technical secondary schools, and the use of CEQAT is one idea. The Project has already developed the “Competencies that schools and teachers can acquire by introducing ‘Guideline for Practical Lesson Improvement’, and their evaluation” and their measurement methods, and it is recommended that CEQAT incorporate it into the school standard to be developed in the future so that Mudiriya and others can monitor, supervise, and provide guidance.

#### Collaboration with other development partners

As explained in Section 5.1, this Project will contribute to all the pillars of TE2.0. The Guideline training proposed in the training package can train teachers on how to practice “repetitive practice and repetitive instruction” in just one day. “Repetitive practice and repetitive instruction” is a unique method that can be introduced in schools without the need for new classes, and there is no duplication of support from the other development partners. In the future, it is hoped that the Guideline training will be implemented by TVETA and that the “Competencies that schools and teachers can acquire by introducing ‘Guideline for Practical Lesson Improvement’, and their evaluation” will be used by CEQAT, but to promote this, it is recommended strengthening collaboration with other development partners who support TE2.0.

### **6.4 Monitoring Plan from the end of the Project to Ex-post Evaluation**

As explained in Section 6.2, the implementation structure will remain the same: the Deputy Minister of Education and Technical Education will be responsible for monitoring and reporting to the SC and EC1, and the EC1 PMU co-director will provide support.



# **Appendices**

## **Appendix 1**

### **Record of Discussion including the Final Version of PDM**

**MINUTES OF MEETINGS  
BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
MINISTRY OF EDUCATION AND TECHNICAL EDUCATION  
FOR AMENDMENT OF THE RECORD OF DISCUSSIONS  
ON  
THE PROJECT FOR ENHANCEMENT OF  
TECHNICAL SECONDARY EDUCATION**

The Japan International Cooperation Agency (hereinafter referred to as “JICA”) and Ministry of Education and Technical Education hereby agree that the Original Record of Discussions on the Project for Enhancement of Technical Secondary Education (hereinafter referred to as “the Project”) signed on 28 December, 2016 and 1<sup>st</sup> amendment of Record of Discussions signed on 10 June, 2019 will be amended as follows:

1. Duration of the Project shall be amended as follows. The revised PDM is shown in Annex 1

	Before	Amended Version
Duration	The duration of the Project will be approximately 4 years from the date when the first Japanese expert (s) for the Project activities in Egypt.	The duration of the Project will be approximately 5 years from the date when the first Japanese expert (s) for the Project activities in Egypt.
Reason: To implement project activities shown in “2. Additional project activities in the extension period” below for enhancement of the sustainability of the Project output, based on the result of the meeting held on 10 December, 2020 between Egyptian Ministry of Education and Technical Education and JICA (Main points discussed of the meeting are shown in Annex 4), to improve the progress and enhance the sustainability of the Project under the circumstances where the COVID-19 pandemic has significant impact on project implementation.		

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	Before	Amended Version
Output 4	A new model school that introduces Japanese style technical education is in operation.	New model schools that introduce Japanese style technical education are in operation.
Reason: As one of additional project activities in the extension period, EI-Sewedy school for applied technology (hereinafter referred to "ATS") is included to the additional model school.		

## 2. Additional project activities in the extension period and main points of discussion

### (1) Support of Additional ATS (EI-Sewedy)

The Project will include EI-Sewedy ATS as an additional model school of the Project and implements activities to support the ATS through utilization of local human resources, under the supervision of Japanese experts. Specifically, the Project Local Trainer will provide the Guideline training to EI-Sewedy teachers, and also will provide skill training to EI-Sewedy teachers by utilizing Skill Local Trainers who have been trained by Japanese experts.

### (2) Dissemination of the Project activities to one whole school

The Project will disseminate the Project activities to all the departments at one pilot school (Taharir school, Port Said). Specifically, the Project will provide the Guideline training to other departments' teachers of Taharir school who do not belong to the original pilot departments under the supervision of Japanese experts, while the Skill Trainers will provide skill training to them.

### (3) Exploring certification of master trainers

In this regard, the Project will not support to explore certification of master trainers due to the limitation of the Project's resources in the extension period. The Project will only share relevant knowledge and experience in Japan.

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(4) “Objectively Verifiable Indicators” for additional project activities

The “Objectively Verifiable Indicators” for the additional project activities will be defined by the result of the base-line survey and be evaluated by the end-line survey.

(5) Measurement of Project's Impact on El Araby School Teachers at mechanical department

The Project will define required competencies for teachers / master trainers to implement repetitive practice / repetitive instruction described in the Guideline<sup>1</sup>. Based on these competencies, the project will evaluate El-Araby school teachers at mechanical department

(6) Allowance for Skill Local Trainers

JICA will cover necessary allowance in accordance with JICA's regulations to utilize Skill Local Trainers as per request by MOETE and the difficulty in travel of Japanese experts during the COVID-19 pandemic.

3. Descriptions in “Main Points Discussed” in the original Record of Discussions relating to the amendments shall be replaced accordingly.

4. All the other articles of the original Record of Discussions and 1<sup>st</sup> amendment of Record of Discussions shall remain unchanged.

5. This amendment will become effective as of 31 January, 2021.

(End)

Annex 1 : PDM ver.2.0

Annex 2 : Original Record of Discussions

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<sup>1</sup> Draft of competencies are: 1) competency to define what students should acquire, 2) competency to make students understand what students should acquire, 3) competency to make opportunities for students to practice and 4) competency to instruct student repeatedly.

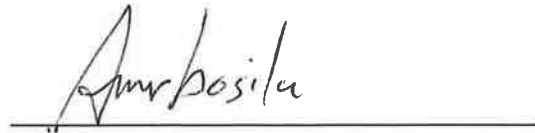
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Annex 3 : 1<sup>st</sup> Amendment of Record of Discussions

Cairo, 31 January, 2021



Mr. OMURA Yoshifumi  
Chief Representative,  
JICA Egypt Office  
Japan



Dr. Amr Bosila  
Director of PMU, Ministry of  
Education and Technical Education  
Arab Republic of Egypt

## Annex 1 Project Design Matrix ver. 2.0

Project Name : The Project for Enhancement of Technical Secondary Education

Duration : Approximately 5 years from the date when the first Japanese expert(s) for the Project arrives in Egypt

Target Group: Technical secondary schools

Project Site: Cairo and Port Said, El-Obour and near Cairo Area<sup>1</sup>

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p><b>Overall Goal<sup>2</sup></b></p> <p>The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt.</p>	<ul style="list-style-type: none"> <li>• 20 technical secondary schools have introduced the model activities in <u>electrical &amp; electronics and mechanical departments.</u></li> <li>• 70% of private companies that employ graduates from the technical secondary school that have introduced the model activities are satisfied with the <u>graduates.</u></li> </ul>	<p>Survey done by the Project</p>	
<p><b>Project Purpose</b></p> <p>The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school<sup>3</sup>.</p>	<ol style="list-style-type: none"> <li>1. <u>Guidelines for introducing Japanese style technical education are approved by MOETE for expansion.</u></li> <li>2. 70% of students are satisfied with the <u>Japanese-style classes</u> given at the technical secondary schools that have introduced the model activities (i.e. a) whether the practical lessons are easy-to-follow and b) whether they think they could be equipped with <u>basic hard and soft skills at practical lessons</u>).</li> <li>3-1. <u>(Dual system) 80% of graduates who sought for jobs, have obtained those at the technical secondary schools that have introduced the model activities.</u></li> <li>3-2. <u>(Conventional system) 20% of graduates who sought for jobs have obtained those at the technical secondary schools that have introduced the model activities.</u></li> </ol>	<p>Records in the pilot schools</p> <p>Survey done by the Project</p>	<ul style="list-style-type: none"> <li>• MOETE continues to work towards enhancing and maintaining motivation of pilot school principals to improve current conditions at schools.</li> <li>• The socioeconomic conditions do not worsen</li> <li>• Educational policies in the technical education sector do not change.</li> <li>• Economic performance and recruitment plans in local partner companies do not worsen drastically.</li> <li>• A new technical secondary school, which is to be used as a model for introducing Japanese style technical education, is to be established under auspice of</li> </ul>

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	MOETE in cooperation with industry.	
<p><u>Outputs</u></p> <p>1. School management at pilot schools is improved through introducing Japanese style school management systems.</p>	<p>1-1 <u>90% of teachers start lessons on time at pilot schools.</u></p> <p>1-2 <u>90% of students are rightly seated in a classroom/ laboratory at the starting time of the lessons at pilot schools.</u></p> <p>1-3 <u>Achievement reports based on the guidelines have been submitted to Idara/Mudiriya/MOETE annually.</u></p>	<p>Records in the pilot schools</p> <p>Survey done by the Project</p>
<p>2. Students acquire basic hard skills<sup>4</sup> and soft skills<sup>5</sup> through introducing improved practical lessons at pilot schools.</p>	<p>2-1 <u>30% of students' products are graded as "good" by Japanese standard assessment at pilot departments.</u></p> <p>2-2 <u>95% of students properly wear clothes in the workshop according to the safety standard of the practical lessons at pilot departments.</u></p> <p>2-3 <u>95% of tools and materials are properly restored after use at the end of the practical lessons at pilot schools.</u></p> <p>2-4 <u>Achievement reports based on the guidelines have been submitted to Idara/Mudiriya/MOETE annually.</u></p>	<p>Survey done by the Project</p>
<p>3. Local companies and pilot schools are cooperating with each other.</p>	<p>3-1-1 <u>(Dual system) 4 collaborative activities per year are implemented with local private companies, such as training, internship programs, study visits to local companies.</u></p> <p>3-1-2 <u>(Conventional system) 6 collaborative activities per year such as training, internship programs, study visits to local companies.</u></p> <p>3-2 <u>50% of graduates' placement records after six months of graduation are traced and kept by the pilot schools every year.</u></p>	<p>Records in the pilot schools</p> <p>Records in the pilot schools</p> <p>Records in the pilot schools</p>
<p>4. New model schools<sup>6</sup> that introduce Japanese style technical education are in operation.</p>	<p>4-1 <u>90% of teachers start lessons on time at the new model school.</u></p> <p>4-2 <u>90% of students are rightly seated in a classroom/ laboratory at the starting time of the lessons at the new model school.</u></p> <p>4-3 <u>30% of students' products are graded as "good" by Japanese standard</u></p>	<p>Survey done by the Project</p>

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	<p>assessment at the pilot department of the new model school.</p> <p>4-4 <u>90% of students properly wear clothes in the workshop according to the safety standard of the practical lessons at the pilot department of the new model school.</u></p> <p>4-5 <u>95% of tools and materials are properly restored after use at the end of the practical lessons at the pilot department of the new model school.</u></p> <p>4-6 <u>4 collaborative activities per year are implemented with local private companies, such as training, internship programs, study visits to local companies.</u></p> <p>4-7 <u>50% of students for whom the new model school keeps records of their career development information (such as department, ID number, name, address, contact numbers, and target companies/colleges, etc).</u></p> <p>4-8 <u>5 training programs are conducted based on the guidelines for teaching and management level staff, of the new model school.</u></p>	
<p><b>Activities</b></p> <p>1-1 The organizational framework of the pilot schools is improved.</p> <p>1-2 Teachers and management positions of the pilot schools are trained to improve school management.</p> <p>1-3 Pilot schools develop and implement action plans to improve student discipline in the school.</p> <p>1-4 Pilot schools maintain and continue the improved conditions based on the action plan.</p> <p>1-5 Pilot schools conduct effective verification on student discipline.</p> <p>1-6 Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effect verification results.</p> <p>2-1 Pilot schools select a practical subject to be improved through model</p>	<p><b>Inputs</b></p> <p><b>1. Japanese side</b></p> <p>✓ Expert</p> <p>➤ Co-director</p> <p>➤ Chief Advisor</p> <p>➤ School Management</p> <p>➤ School Industry Partnership</p> <p>➤ Training Planning Management and Coordination</p> <p>➤ Industrial Training (tentatively Electrical, Electronics, and Mechanical)</p> <p>✓ Local staff</p> <p>➤ Interpreter</p>	

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<p>activities.</p> <p>2-2 Training for teachers of the selected practical subject is conducted.</p> <p>2-3 Pilot schools introduce trial practical education to improve students' basic hard skills and soft skills.</p> <p>2-4 Pilot schools conduct improved practical education.</p> <p>2-5 Pilot schools conduct effective verification.</p> <p>3-1 Pilot schools establish the Work Transition Unit</p> <p>3-2 The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data)</p> <p>3-3 The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainers, and/or practical training at the companies, by collaboration with local partner companies.</p> <p>4-1 Technical advice necessary for establishing a new model school is provided.</p> <p>4-2 The new model school selects a practical subject to be improved through model activities.</p> <p>4-3 Equipment necessary for the new model school to improve practical training of the selected subject is prepared.</p> <p>4-4 The new model school develops organizational framework, including the Work Transition Unit, to manage model activities in the new model school.</p> <p>4-5 Training for teaching and management level staff, of the new model school on improvement of school management is conducted.</p> <p>4-6 The new model school plans and implements initial activities to improve school management so as to enhance students' discipline.</p> <p>4-7 The new model school maintain improved conditions and continues</p>	<p>➢ Local administrative coordinator</p> <p>✓ Training in Japan</p> <p>✓ Teaching and learning materials for the pilot schools</p> <p>✓ Minimum equipment for the pilot department of the new model school (equipment on the list of MOETE standard equipment)</p> <p>✓ Other essential operations for implementing the project</p> <p>2. <b><u>Egyptian side</u></b></p> <p>✓ Counterpart Personnel</p> <p>➢ Project Director (Director of PMU)</p> <p>➢ <u>Deputy Project Director (Deputy-Director of PMU)</u></p> <p>➢ Project Coordinator</p> <p>➢ Director of Technical Education in pilot Idara and Mudiriya Offices</p> <p>➢ Other administrative staff</p> <p>➢ Drivers</p> <p>✓ Facilities</p> <p>➢ Office space and necessary facilities for JICA experts</p> <p>✓ Training materials for the pilot schools</p> <p>✓ Office and stationery supplies materials for the pilot schools</p> <p>✓ Trainings costs (travel allowance of C/Ps and teachers, venue fee, etc.)</p> <p>✓ Incentives for the pilot school teachers</p> <p>✓ Other essential costs</p>
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activities	<p>4-8 The new model school conducts effective verification on students' discipline.</p> <p>4-9 Training for teachers of the selected practical subject is conducted.</p> <p>4-10 The new model school introduces practical education to improve students' basic hard skills and soft skills.</p> <p>4-11 The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data)</p> <p>4-12 The new model school tries to introduce model practical education such as final year project work in order to become a local model for technical secondary schools.</p>
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1 Target schools in Target Sites are as follows:

Target Type	School Name	School type	Pilot Department
Pilot school	Dr. Ahmed Zewail school for dual education for girls	Dual	Electronics
	El Tahrir Technical Secondary School For Girls	Conventional	Electronics, Electricity, Computers, Decoration and Ready-Made Garment
	Port Said Technical Secondary School For Girls	Conventional	Electronics
	Al Obour Industrial Secondary School	Dual & Conventional	Mechanical maintenance (Dual)
Model School	El Araby School for Applied Technology	ATS	Mechanics
	El Sewedy school for applied technology	ATS	Mechanics and Electric

2 Achievements of the Overall Goal are evaluated three years after the termination of the Project.

3 Model activities are conducted at pilot schools, which are already operated, and at a new model school that is to be prepared by the Egyptian side.

4 Hard skills is defined by the Project as specific and teachable abilities, including: 1) Basic skills (single basic skills, learnt through basic practical training); 2) High-level skills (ability to utilize high-level equipment); and 3) Applied skills (ability to make a product by oneself, utilizing a broad set of knowledge, skills, and etc.).

5 Soft skills is defined by the Project as interpersonal skills, such as work attitudes to improve the precision of the job, knowledge of safety, team work, 5S (sort, set in order, shine, standardize, and sustain), and etc.

6 New model schools are classified as Applied Technical School by MOETE.

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RECORD OF DISCUSSIONS  
ON  
THE PROJECT FOR ENHANCEMENT OF TECHNICAL  
SECONDARY EDUCATION  
IN  
ARAB REPUBLIC OF EGYPT  
AGREED UPON BETWEEN  
MINISTRY OF EDUCATION AND TECHNICAL EDUCATION  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

Cairo, 28 December, 2016



Teruyuki Ito  
Chief Representative  
JICA Egypt Office,  
Japan International Cooperation Agency  
Japan



Mohamed Ibrahim Hassan  
Elhalawany  
First Undersecretary for Ministry of  
Education and Technical Education,  
Head of Technical Education Sector  
Ministry of Education and Technical  
Education,  
Arab Republic of Egypt

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Based on the minutes of meetings on the Detailed Planning Survey on the Project for Enhancement of Technical Secondary Education (hereinafter referred to as "the Project") signed on October 8<sup>th</sup> between Ministry of Education and Technical Education (hereinafter referred to as "MOETE") and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA held a series of discussions with MOETE and relevant organizations to develop a detailed plan of the Project.

Both parties agreed the details of the Project and the main points discussed as described in the Appendix 1 and the Appendix 2 respectively.

Both parties also agreed that MOETE, the counterpart to JICA, will be responsible for the implementation of the Project in cooperation with JICA, coordinate with other relevant organizations and ensure that the self-reliant operation of the Project is sustained during and after the implementation period in order to contribute toward social and economic development of Arab Republic of Egypt.

The Project will be implemented within the framework of the Agreement on Technical Cooperation signed on 15th June 1983 (hereinafter referred to as "the Agreement") and the Note Verbales exchanged on 17<sup>th</sup> May 2016 between the Government of Japan (hereinafter referred to as "GOJ") and the Government of Arab Republic of Egypt (hereinafter referred to as "GOE".)

Appendix 1: Project Description

Appendix 2: Minutes of Meetings on the Detailed Planning Survey

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## PROJECT DESCRIPTION

### I. BACKGROUND

On the occasion of the official visit to Japan by H.E.Mr.Abdel-Fattah El-Sisi, President of the Arab Republic of Egypt, in February 2016, both countries officially announced the importance of their joint partnership on education: Egypt-Japan Education Partnership "EJEP" to cooperate in the area of education including early childhood, basic, technical and higher education. This project is conducted, on the basis of and as part of this solid partnership, to introduce Japanese style technical educational approach for improving discipline, team work, basic hard skills, and basic soft skills in technical secondary education in Egypt.

### II. OUTLINE OF THE PROJECT

Details of the Project are described in the Logical Framework (Project Design Matrix: PDM) (Annex 1) and the Plan of Operation (Annex 2).

#### **1. Project Title**

The project for enhancement of technical secondary education

#### **2. Expected Goals which will be attained after implementing the Proposed Plan**

The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school.

#### **3. Outputs**

##### Output 1.

School management at pilot schools is improved through introducing Japanese style school management systems.

##### Output 2.

Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.

##### Output 3.

Local companies and pilot schools are cooperating with each other.

##### Output 4.

A new model school that introduces Japanese style technical education is in operation.

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#### 4. Activities

- 1-1. The organizational framework of the pilot schools is improved.
  - 1-2. Teachers and management positions of the pilot schools are trained based on Japanese style discipline, to improve school management.
  - 1-3. Pilot schools develop and implement action plans to improve student discipline in the school.
  - 1-4. Pilot schools maintain and continue the improved conditions based on the action plan.
  - 1-5. Pilot schools conduct an effective verification on student discipline.
  - 1-6. Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effective verification results.
- 
- 2-1. Pilot schools select a practical subject, based on discussions with partner companies, to be improved through model activities.
  - 2-2. Training for teachers of the selected practical subject is conducted.
  - 2-3. Pilot schools introduce trial practical education to improve students' basic hard skills and soft skills through cooperation with partner companies.
  - 2-4. Pilot schools conduct improved practical education.
  - 2-5. Pilot schools conduct impact verification.
- 
- 3-1. Pilot schools establish the Work Transition Unit.
  - 3-2. The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data) based on Japanese style career guidance.
  - 3-3. The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainer, and/or practical training at the companies, by collaboration with local partner companies.
- 
- 4-1. Technical advice necessary for establishing a new model school that introduces Japanese style technical education is provided.
  - 4-2. The new model school selects a practical subject, based on discussions with the partner company, to be improved through model activities.
  - 4-3. Equipment necessary for the new model school to improve practical training of the selected subject is prepared.
  - 4-4. The new model school develops organizational framework, including the Work Transition Unit, to manage model activities.
  - 4-5. Training for teaching and management level staff, of the new model school on improvement of school management is conducted.
  - 4-6. The new model school plans and implements initial activities to improve school management so as to enhance students' discipline.
  - 4-7. The new model school maintain improved conditions and continues activities.

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- 4-8. The new model school conducts effective verification on students' discipline.
- 4-9. Training for teachers of the selected practical subject is conducted.
- 4-10. The new model school introduces practical education to improve students' basic hard skills and soft skills.
- 4-11. The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data).
- 4-12. The new model school tries to introduce model practical education such as final year project work in order to become a local model for technical secondary schools.

## 5. Input

### (1) Input by JICA

#### (a) Dispatch of Experts

- Co-director
- Chief Advisor
- School Management
- School Industry Partnership
- Training Planning Management and Coordination
- Industrial Training (tentatively Electrical & Electronics and Mechanical)

#### (b) Local staff

- Local administrative coordinator

#### (c) Training in Japan

#### (d) Teaching and learning materials for the pilot activities at pilot schools

#### (e) Minimum equipment necessary for conducting the model activities at the pilot department of the new model school (equipment on the list of MOETE standard equipment)

#### (f) Other essential operations for implementing the Project

#### (g) Machinery and Equipment

In case of importation, the machinery, equipment and other materials under II-5 (1) e. above will become the property of the MOETE upon being delivered C.I.F. (cost, insurance and freight) to the Egyptian authorities concerned at the ports and/or airports of disembarkation.

### (2) Input by MOETE

MOETE will take necessary measures to provide at its own expense:

#### (a) Counterpart Personnel (C/P)

- Project Director (Director of Project Management Unit, PMU)
- Project Coordinator
- Director of Technical Education in Pilot Modereya Offices
- Other administrative staff
- Drivers

#### (b) Facilities and equipment

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- Office space and necessary facilities and equipment for JICA experts
- (c) Supply or replacement of machinery, equipment, instruments, tools, spare parts and any other educational materials necessary for the implementation of the Project other than the equipment provided by JICA;
- (d) Training materials for the pilot schools
- (e) Office and stationery supplies and materials for the pilot schools for Pilot Activities
- (f) Trainings cost (travel allowance of C/Ps and teachers, venue fee, etc)
- (g) Incentives for extended working hours of teachers
- (h) Other essential costs
- (i) Furniture and equipment for the pilot schools and the target schools
- (j) Credentials or identification cards to enter MOETE's premises and schools
- (k) Available data (including maps and photographs) and information related to the Project only for the Project use under MOETE guidance
- (l) Running expenses necessary for the implementation of the Project in MOETE's premises such as electricity, water and internet
- (m) Expenses necessary for transportation within Egypt of the equipment referred to in II-5 (1) as well as for the installation, operation and maintenance thereof; and
- (n) Necessary facilities for the JICA experts for the remittance as well as utilization of the funds introduced into Arab Republic of Egypt from Japan in connection with the implementation of the Project

#### 6. Implementation Structure

The project organization chart is given in the Annex 3. The roles and assignments of relevant organizations are as follows:

##### (1) MOETE

- Project Director  
Head of Technical Education Sector, MOETE
- Project Coordinator
- Counterpart Personnel  
Director of Technical Education in pilot/target Modereya Offices Other administrative staff

##### (2) JICA Experts (Short Term and Long Term)

The JICA experts will give necessary technical guidance, advice and recommendations to MOETE on any matters pertaining to the implementation of the Project.

##### (3) Joint Coordinating Committee

Under the Steering Committee of Egypt-Japan Education Partnership (EJEP), the Executive Committee 1 (hereinafter referred to as EC1), composed of relevant high-ranking stakeholders from both governments, has been set up. The main mandate of EC1 is to oversee preparation, coordination, implementation, and follow-up of the components of the Project. EC1 also

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approves the annual work plan, reviews the progress, revises the overall plan when necessary, conducts monitoring and evaluation of the project, and will exchange opinions on major issues that arise during the implementation of the Project. EC1 will hold regular meetings when it deems necessary. The list of stakeholders is given in the Annex 4.

#### **7. Project Sites and Beneficiaries**

- (1) The Project sites will be Port Said and near Cairo Area (pilot schools to be determined)
- (2) Beneficiaries will be students and teachers in pilot schools in above mentioned area.

#### **8. Duration**

The duration of the Project will be approximately 4 years from the date when the first Japanese expert(s) for the Project arrives in Egypt.

#### **9. Reports**

MOETE and JICA experts will jointly prepare the following reports in English.

- (1) Monitoring Sheet on semiannual basis until the project completion
- (2) Project Completion Report at the time of project completion

#### **10. Environment and Social Considerations**

Whereas MOETE and JICA will abide by "JICA Guidelines for Environmental and Social Considerations" in order to ensure that appropriate considerations will be made for the environmental and social impacts of the Project, the Project has been classified as a Category C project and needs no more consideration processes on this matter

### **III. UNDERTAKINGS OF MOETE**

MOETE will take necessary measures to support the smooth implementation of the Project within the framework of the Agreement on Technical Cooperation signed on 15th June 1983 between GOJ and GOE.

### **IV. MONITORING AND EVALUATION**

JICA and MOETE will jointly and regularly monitor the progress of the Project through the Monitoring Sheets based on the Project Design Matrix (PDM) and Plan of Operation (PO). The Monitoring Sheets will be reviewed every six (6) months.

Also, Project Completion Report shall be drawn up one (1) month before the termination of the Project.

JICA will conduct the following evaluations and surveys to mainly verify sustainability and impact of the Project and draw lessons. The Egyptian side is required to provide necessary support for them.

- (1) Ex-post evaluation three (3) years after the Project completion, in principle
- (2) Follow-up surveys on necessity basis

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**V. PROMOTION OF PUBLIC SUPPORT**

For the purpose of promoting support for the Project, MOETE will take appropriate measure to make the Project widely known to the people of Egypt.

**VI. MISCONDUCT**

If JICA or MOETE receives reports related to suspected corrupt or fraudulent practices in the implementation of the Project, JICA or MOETE and relevant organizations will provide the other party with such details, as the other party may reasonably request, including those related to any concerned personnel of the contractor, consultant, government, and/or public organizations.

The person and/or company which shall report such corrupt or fraudulent practices in the implementation of the project shall be granted fair and favorable treatment by the concerned authorities, in accordance with its respective applicable national laws and regulations.

**VII. MUTUAL CONSULTATION**

JICA and MOETE will consult each other whenever major issues arise in the course of Project implementation.

**VIII. AMENDMENTS**

The record of discussions may be amended by the minutes of meetings between JICA and MOETE. However, PO may be amended in the Monitoring Sheets.

The minutes of meetings will be signed by authorized persons of each side who may be different from the signers of the record of discussions.

- Annex 1 Project Design Matrix
- Annex 2 Plan of Operation
- Annex 3 Implementation Structure
- Annex 4 List of Stakeholders

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## Annex 1: Project Design Matrix

Project name : The Project for Enhancement of Technical Secondary Education  
 Duration: Approximately 4 years from the date when the first Japanese expert(s) for the Project arrives in Egypt, Target Group: Technical secondary schools

Narrative Summary		Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<b>Overall Goal</b> The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt.		<ul style="list-style-type: none"> <li>The number of technical secondary schools that have introduced the model activities.</li> <li>Satisfaction of industries with graduates from the technical secondary schools that have introduced the model activities</li> </ul>	Survey done by the project	
<b>Project Purpose</b> The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school.		<ul style="list-style-type: none"> <li>Satisfaction of students with the classes given at the technical secondary schools that have introduced the model activities (e.g. given, and etc.)</li> <li>The number of graduates who pursued and obtained a job at the technical secondary schools that have introduced the model activities</li> <li>The number of action plans for enhancing model activities developed by the technical secondary schools that have introduced the model activities</li> </ul>	Records in the pilot schools Survey done by the project	<ul style="list-style-type: none"> <li>MOETE continues to work towards enhancing and maintaining motivation of pilot school principals to improve current conditions at schools.</li> <li>The socioeconomic conditions do not worsen.</li> <li>Educational policies in the technical education sector do not change.</li> <li>Economic performance and recruitment plans in local partner companies do not worsen drastically.</li> <li>A new technical secondary school, which is to be used as a model for introducing Japanese style technical education, is to be established under auspice of MOETE in cooperation with industry.</li> </ul>
<b>Outputs</b>				
1. School management at pilot schools is improved through introducing Japanese style school management systems.	1-1 Activities conducted for improving school management (e.g. The frequency of teachers' meetings, information visualization, and development of filing systems) 1-2 Improvement of teachers' and students' punctuality at pilot classes 1-3 A guideline on school management of each pilot school 2-1 Improvement of students' basic hard skills 2-2 Improvement of students' soft skills		Records in the pilot schools Survey done by the project	
2. Students acquire basic hard skills <sup>2</sup> and soft skills <sup>3</sup> through introducing improved practical lessons at pilot schools.			Survey done by the project	
3. Local companies and pilot schools are cooperating with each other.	3-1 The record of graduates' placement 3-2 The record of recruitment information from local industries at the pilot schools 3-3 The number of training and internship programs in partner companies, and study visits to local companies 4-1 Japanese style school management of the new model schools		Records in the pilot schools Records in the pilot schools Records in the pilot schools	
4. A new model school that introduces Japanese style technical education is in operation.			Survey done by the project	

1. Model activities are conducted at pilot schools, which are already operated, and at a new model school that is to be prepared by the Egyptian side.  
 2. Hard skills is defined by the Project as specific and teachable abilities, including: 1) Basic skills (single basic skills, learnt through basic practical training); 2) High-level skills (ability to utilize high-level equipment); and 3) Applied skills (ability to make a product by oneself, utilizing a broad set of knowledge, skills, and etc.).  
 3. Soft skills is defined by the Project as interpersonal skills, such as work attitudes to improve the precision of the job, knowledge of safety, team work, 5S (sort, set in order, shine, standardize, and sustain), and etc.

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Activities		Inputs	
1-1	The organizational framework of the pilot schools is improved.	<ul style="list-style-type: none"> <li>1. <u>Japanese side</u></li> <li>✓ Expert</li> <li>➢ Co-director</li> <li>➢ Chief Advisor</li> <li>➢ School Management</li> <li>➢ School Industry Partnership</li> <li>➢ Training Planning Management and Coordination</li> <li>➢ Industrial Training (tentatively Electrical &amp; Electronics, and Mechanical)</li> <li>✓ Local staff</li> <li>➢ Interpreter</li> <li>➢ Local administrative coordinator</li> <li>✓ Training in Japan</li> <li>✓ Teaching and learning materials for the pilot schools</li> <li>✓ Minimum equipment necessary for conducting the model activities at the pilot department of the new model school (equipment on the list of MOETE standard equipment)</li> <li>✓ Other essential operations for implementing the project</li> </ul>	
1-2	Teachers and management positions of the pilot schools are trained, based on Japanese style discipline, to improve school management.		
1-3	Pilot schools develop and implement action plans to improve student discipline in the school.		
1-4	Pilot schools maintain and continue the improved conditions based on the action plan.		
1-5	Pilot schools conduct effective verification on student discipline.		
1-6	Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effect verification results.		
2-1	Pilot schools select a practical subject, based on discussions with partner companies, to be improved through model activities.		
2-2	Training for teachers of the selected practical subject is conducted.		
2-3	Pilot schools introduce trial practical education to improve students' basic hard skills and soft skills through cooperation with partner companies.		
2-4	Pilot schools conduct improved practical education.		
2-5	Pilot schools conduct effective verification.		
3-1	Pilot schools establish the Work Transition Unit		
3-2	The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data) based on Japanese style career guidance.		
3-3	The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainers, and/or practical training at the companies, by collaboration with local partner companies.		
4-1	Technical advice necessary for establishing a new model school that introduces Japanese style technical education is provided.	<ul style="list-style-type: none"> <li>2. <u>Egyptian side</u></li> <li>✓ Counterpart Personnel</li> <li>➢ Project Director (Director of PMU)</li> <li>➢ Project Coordinator</li> <li>➢ Director of Technical Education in pilot Idara and Modereya Offices</li> <li>➢ Other administrative staff</li> <li>➢ Drivers</li> <li>➢ Facilities</li> <li>➢ Office space and necessary facilities for JICA experts</li> <li>✓ Training materials for the pilot schools</li> <li>✓ Office and stationery supplies materials for the pilot schools</li> <li>✓ Trainings costs (travel allowance of C/Ps and teachers, venue fee, etc.)</li> <li>✓ Incentives for the pilot school teachers</li> <li>✓ Other essential costs</li> </ul>	
4-2	The new model school selects a practical subject, based on discussions with the partner company, to be improved through model activities.		
4-3	Equipment necessary for the new model school to improve practical training of the selected subject is prepared.		
4-4	The new model school develops organizational framework, including the Work Transition Unit, to manage model activities in the new model school.		
4-5	Training for teaching and management level staff, of the new model school on improvement of school management is conducted.		
4-6	The new model school plans and implements initial activities to improve school management so as to enhance students' discipline.		
4-7	The new model school maintain improved conditions and continues activities		
4-8	The new model school conducts effective verification on students' discipline.		
4-9	Training for teachers of the selected practical subject is conducted.		
4-10	The new model school introduces practical education to improve students' basic hard skills and soft skills.		
4-11	The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data)		
4-12	The new model school tries to introduce model practical education such as final year project work in order to become a local model for technical secondary schools.		

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## Annex 2 Plan of Operation

Project Name: The Project for Enhancement of Technical Secondary Education

No	Activities	2017				2018				2019				2020			
		2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
Project Period		[Timeline bar]															
School Semester		[Timeline bar]															
Output 1. School management at pilot schools is improved through introducing Japanese style school management systems.																	
1-1	The organizational framework of the pilot schools is improved	[X]															
1-2	Teachers and management positions of the pilot schools are trained to improve school management	[X]															
1-3	Pilot schools develop and implement action plans to improve student discipline in the school	[X]															
1-4	Pilot schools maintain and continue the improved conditions based on the action plan.	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
1-5	Pilot schools conduct effective verification on student discipline	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
1-6	Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effect verification results	[X]															
Output 2. Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.																	
2-1	Pilot schools select a practical subject to be improved through model activities	[X]															
2-2	Training for teachers of the selected practical subject is conducted	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
2-3	Pilot schools introduce trial practical education to improve students' basic hard skills and soft skills	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
2-4	Pilot schools conduct improved practical education	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
2-5	Pilot schools conduct effective verification	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Output 3. Local companies and pilot schools are cooperating with each other.																	
3-1	Pilot schools establish the Work Transition Unit.	[X]															
3-2	The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data).	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
3-3	The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainers and/or practical training at the companies, by collaboration with local partner companies	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
Output 4. A new model school that introduces Japanese style technical education is in operation.																	
4-1	Technical advice necessary for establishing a new model school is provided.	[X]															
4-2	The new model school selects a practical subject to be improved through model activities	[X]															
4-3	Equipment necessary for the new model school to improve practical training of the selected subject is prepared	[X]															
4-4	The new model school develops organizational framework, including the Work Transition Unit, to manage model activities in the new model school	[X]															
4-5	Training for teaching and management level staff, of the new model school on improvement of school management is conducted	[X]															
4-6	The new model school plans and implements initial activities to improve school management so as to enhance students' discipline.	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-7	The new model school maintain improved conditions and continues activities	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-8	The new model school conducts effective verification on students' discipline	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-9	Training for teachers of the selected practical subject is conducted	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-10	The new model school introduces practical education to improve students' basic hard skills and soft skills	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-11	The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data)	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-12	The new model school try to introduce model practical education such as final year project work in order to become a local model for technical secondary schools	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]

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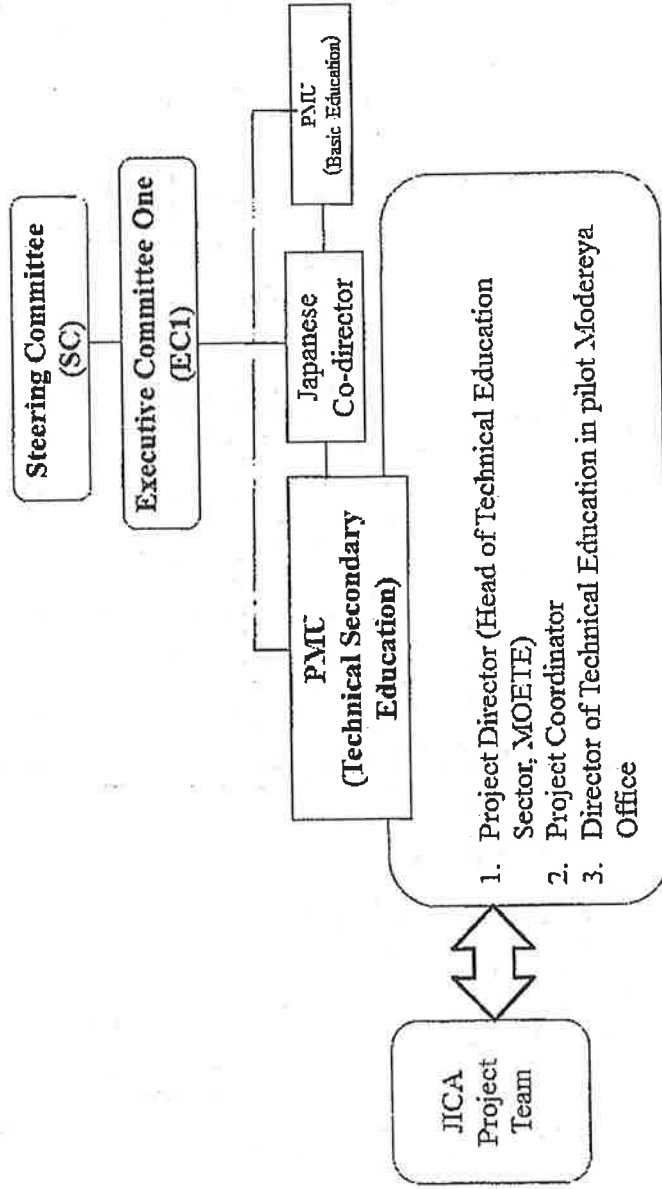
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Annex 3

# Implementation Structure



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List of Stakeholders

- i) The Minister of Education and Technical Education will preside over this Executive Committee. In case of his absence, the Coordinator of the Steering Committee will chair and coordinate between the Steering Committee and this Executive Committee.
- ii) The members of the Egyptian side are high-ranking officials from the Ministry of Education and Technical Education, the Ministry of Higher Education, the Ministry of International Cooperation and the Ministry of Foreign Affairs. Other representative from relevant ministries and experts can be invited when necessary.
- iii) The members of the Japanese side are the Economic Counsellor of the Embassy of Japan and Chief Representative of JICA Egypt Office. Japanese experts can be invited when necessary.

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**MINUTES OF MEETINGS  
BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
MINISTRY OF EDUCATION AND TECHNICAL EDUCATION  
FOR AMENDMENT OF THE RECORD OF DISCUSSIONS  
ON  
THE PROJECT FOR ENHANCEMENT OF  
TECHNICAL SECONDARY EDUCATION**

The Japan International Cooperation Agency (hereinafter referred to as "JICA") and Ministry of Education and Technical Education hereby agree that the Record of Discussions on the Project for Enhancement of Technical Secondary Education signed on 28 December, 2016 will be amended as follows:

I. Annex

Before	Amended Version
Annex 1 PDM	Annex 1 PDM ver.1.0
Reason: In accordance with the Minutes of Meetings of the Project Consultation Mission signed on February 28 <sup>th</sup> , 2019, PDM shall be amended as underlined in the attached Annex 1.	

This amendment will become effective as of (signed date) .

(End)

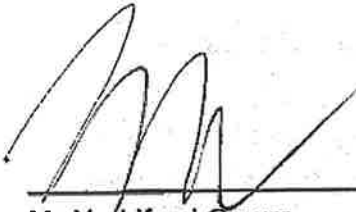
Annex 1 : PDM ver.1.0

Annex 2 : Original Record of Discussions

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Cairo, June 10, 2019



Mr. Yoshifumi Omura  
Chief Representative of Egypt Office  
JICA  
Japan



Ms. Habiba Ahmed Ezzeldine Hosny  
Minister's Advisor for Technical Education,  
and Coordinator of the Egyptian Education  
Reform Project,  
MOETE  
Arab Republic of Egypt

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**Annex 1 Project Design Matrix ver. 1.0**

Project Name : The Project for Enhancement of Technical Secondary Education

Duration : Approximately 4 years from the date when the first Japanese expert(s) for the Project arrives in Egypt

Target Group: Technical secondary schools

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p><b>Overall Goal<sup>1</sup></b> The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt.</p>	<ul style="list-style-type: none"> <li>• 20 technical secondary schools have introduced the model activities in electrical &amp; electronics and mechanical departments.</li> <li>• 70% of private companies that employ graduates from the technical secondary school that have introduced the model activities are satisfied with the graduates.</li> </ul>	<p>Survey done by the Project</p>	
<p><b>Project Purpose</b> The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school<sup>2</sup>.</p>	<ol style="list-style-type: none"> <li>1. Guidelines for introducing Japanese style technical education are approved by MOETE for expansion.</li> <li>2. 70% of students are satisfied with the Japanese-style classes given at the technical secondary schools that have introduced the model activities (i.e. a) whether the practical lessons are easy-to-follow and b) whether they think they could be equipped with basic hard and soft skills at practical lessons).</li> <li>3-1. (Dual system) 80% of graduates who sought for jobs, have obtained those at the technical secondary schools that have introduced the model activities.</li> <li>3-2. (Conventional system) 20% of graduates who sought for jobs have obtained those at the technical secondary schools that have introduced the model activities.</li> </ol>	<p>Records in the pilot schools  Survey done by the Project</p>	<ul style="list-style-type: none"> <li>• MOETE continues to work towards enhancing and maintaining motivation of pilot school principals to improve current conditions at schools.</li> <li>• The socioeconomic conditions do not worsen.</li> <li>• Educational policies in the technical education sector do not change.</li> <li>• Economic performance and recruitment plans in local partner companies do not worsen drastically.</li> <li>• A new technical secondary school, which is to be used as a model for introducing Japanese style technical education, is to be established under auspice of</li> </ul>

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	MOETI: in cooperation with industry.		
<p><b>Outputs</b></p> <p>1. School management at pilot schools is improved through introducing Japanese style school management systems.</p>	<p>Records in the pilot schools</p> <p>Survey done by the Project</p>	<p>1-1 <u>90% of teachers start lessons on time at pilot schools.</u></p> <p>1-2 <u>90% of students are rightly seated in a classroom/ laboratory at the starting time of the lessons at pilot schools.</u></p> <p>1-3 <u>Achievement reports based on the guidelines have been submitted to Idara/Mudirriya/MOETI annually.</u></p>	
<p>2. Students acquire basic hard skills<sup>3</sup> and soft skills<sup>4</sup> through introducing improved practical lessons at pilot schools.</p>	<p>Survey done by the Project</p>	<p>2-1 <u>30% of students' products are graded as "good" by Japanese standard assessment at pilot departments.</u></p> <p>2-2 <u>95% of students properly wear clothes in the workshop according to the safety standard of the practical lessons at pilot departments.</u></p> <p>2-3 <u>95% of tools and materials are properly restored after use at the end of the practical lessons at pilot schools.</u></p> <p>2-4 <u>Achievement reports based on the guidelines have been submitted to Idara/Mudirriya/MOETI annually.</u></p>	
<p>3. Local companies and pilot schools are cooperating with each other.</p>	<p>Records in the pilot schools</p> <p>Records in the pilot schools</p> <p>Records in the pilot schools</p>	<p>3-1-1 <u>(Dual system) 4 collaborative activities per year are implemented with local private companies, such as training, internship programs, study visits to local companies.</u></p> <p>3-1-2 <u>(Conventional system) 6 collaborative activities per year such as training, internship programs, study visits to local companies.</u></p> <p>3-2 <u>50% of graduates' placement records after six months of graduation are traced and kept by the pilot schools every year.</u></p>	
<p>4. A new model school<sup>5</sup> that introduces Japanese style technical education is in operation.</p>	<p>Survey done by the Project</p>	<p>4-1 <u>90% of teachers start lessons on time at the new model school.</u></p> <p>4-2 <u>90% of students are rightly seated in a classroom/ laboratory at the starting time of the lessons at the new model school.</u></p> <p>4-3 <u>30% of students' products are graded as "good" by Japanese standard</u></p>	

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	<p>assessment at the pilot department of the new model school.</p> <p>4-4 <u>90% of students properly wear clothes in the workshop according to the safety standard of the practical lessons at the pilot department of the new model school.</u></p> <p>4-5 <u>95% of tools and materials are properly restored after use at the end of the practical lessons at the pilot department of the new model school.</u></p> <p>4-6 <u>4 collaborative activities per year are implemented with local private companies, such as training, internship programs, study visits to local companies.</u></p> <p>4-7 <u>50% of students for whom the new model school keeps records of their career development information (such as department, ID number, name, address, contact numbers, and target companies/colleges, etc).</u></p> <p>4-8 <u>5 training programs are conducted based on the guidelines for teaching and management level staff, of the new model school.</u></p>	
<p><b>Activities</b></p> <p>1-1 The organizational framework of the pilot schools is improved.</p> <p>1-2 Teachers and management positions of the pilot schools are trained to improve school management.</p> <p>1-3 Pilot schools develop and implement action plans to improve student discipline in the school.</p> <p>1-4 Pilot schools maintain and continue the improved conditions based on the action plan.</p> <p>1-5 Pilot schools conduct effective verification on student discipline.</p> <p>1-6 Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effect verification results.</p>	<p><b>Inputs</b></p> <p>1. <u>Japanese side</u></p> <p>✓ Expert</p> <p>➤ Co-director</p> <p>➤ Chief Advisor</p> <p>➤ School Management</p> <p>➤ School Industry Partnership</p> <p>➤ Training Planning Management and Coordination</p> <p>➤ Industrial Training (tentatively Electrical, Electronics, and Mechanical)</p> <p>✓ Local staff</p>	

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<p>2-1 Pilot schools select a practical subject to be improved through model activities.</p>	<ul style="list-style-type: none"> <li>➤ Interpreter</li> <li>➤ Local administrative coordinator</li> </ul>	
<p>2-2 Training for teachers of the selected practical subject is conducted.</p>	<ul style="list-style-type: none"> <li>✓ Training in Japan</li> </ul>	
<p>2-3 Pilot schools introduce trial practical education to improve students' basic hard skills and soft skills.</p>	<ul style="list-style-type: none"> <li>✓ Teaching and learning materials for the pilot schools</li> <li>✓ Minimum equipment for the pilot department of the new model school (equipment on the list of MOETTE standard equipment)</li> <li>✓ Other essential operations for implementing the project</li> </ul>	
<p>2-4 Pilot schools conduct improved practical education.</p>		
<p>2-5 Pilot schools conduct effective verification.</p>		
<p>3-1 Pilot schools establish the Work Transition Unit</p>	<p>2. <u>Egyptian side</u></p> <ul style="list-style-type: none"> <li>✓ Counterpart Personnel</li> </ul>	
<p>3-2 The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data)</p>	<ul style="list-style-type: none"> <li>➤ Project Director (Director of PMU)</li> <li>➤ <u>Deputy Project Director (Deputy-Director of PMU)</u></li> </ul>	
<p>3-3 The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainers, and/or practical training at the companies, by collaboration with local partner companies.</p>	<ul style="list-style-type: none"> <li>➤ Project Coordinator</li> <li>➤ Director of Technical Education in pilot Idara and Mudiriya Offices</li> <li>➤ Other administrative staff</li> </ul>	
<p>4-1 Technical advice necessary for establishing a new model school is provided.</p>		
<p>4-2 The new model school selects a practical subject to be improved through model activities.</p>	<ul style="list-style-type: none"> <li>➤ Drivers</li> <li>✓ Facilities</li> </ul>	
<p>4-3 Equipment necessary for the new model school to improve practical training of the selected subject is prepared.</p>	<ul style="list-style-type: none"> <li>➤ Office space and necessary facilities for JICA experts</li> <li>✓ Training materials for the pilot schools</li> </ul>	
<p>4-4 The new model school develops organizational framework, including the Work Transition Unit, to manage model activities in the new model school.</p>	<ul style="list-style-type: none"> <li>✓ Office and stationery supplies materials for the pilot schools</li> <li>✓ Trainings costs (travel allowance of C/Ps and teachers, venue fee, etc.)</li> </ul>	
<p>4-5 Training for teaching and management level staff, of the new model school on improvement of school management is conducted.</p>	<ul style="list-style-type: none"> <li>✓ Incentives for the pilot school teachers</li> <li>✓ Other essential costs</li> </ul>	
<p>4-6 The new model school plans and implements initial activities to</p>		

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<p>4-7</p>	<p>improve school management so as to enhance students' discipline. The new model school maintain improved conditions and continues activities</p>	
<p>4-8</p>	<p>The new model school conducts effective verification on students' discipline.</p>	
<p>4-9</p>	<p>Training for teachers of the selected practical subject is conducted.</p>	
<p>4-10</p>	<p>The new model school introduces practical education to improve students' basic hard skills and soft skills.</p>	
<p>4-11</p>	<p>The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data)</p>	
<p>4-12</p>	<p>The new model school tries to introduce model practical education such as final year project work in order to become a local model for technical secondary schools.</p>	

1 Achievements of the Overall Goal are evaluated three years after the termination of the Project.  
2 Model activities are conducted at pilot schools, which are already operated, and at a new model school that is to be prepared by the Egyptian side.  
3 Hard skills is defined by the Project as specific and teachable abilities, including: 1) Basic skills (single basic skills, learnt through basic practical training); 2) High-level skills (ability to utilize high-level equipment); and 3) Applied skills (ability to make a product by oneself, utilizing a broad set of knowledge, skills, and etc.).  
4 Soft skills is defined by the Project as interpersonal skills, such as work attitudes to improve the precision of the job, knowledge of safety, team work, 5S (sort, set in order, shine, standardize and sustain), and etc.  
5 A new model school is classified as Applied Technical School by MOETE.

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**RECORD OF DISCUSSIONS**  
**ON**  
**THE PROJECT FOR ENHANCEMENT OF TECHNICAL**  
**SECONDARY EDUCATION**  
**IN**  
**ARAB REPUBLIC OF EGYPT**  
**AGREED UPON BETWEEN**  
**MINISTRY OF EDUCATION AND TECHNICAL EDUCATION**  
**AND**  
**JAPAN INTERNATIONAL COOPERATION AGENCY**

Cairo, 28 December, 2016

  
Teruyuki Ito  
Chief Representative  
JICA Egypt Office,  
Japan International Cooperation Agency  
Japan

  
Mohamed Ibrahim Hassan  
Elhalawany  
First Undersecretary for Ministry of  
Education and Technical Education,  
Head of Technical Education Sector  
Ministry of Education and Technical  
Education,  
Arab Republic of Egypt

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Based on the minutes of meetings on the Detailed Planning Survey on the Project for Enhancement of Technical Secondary Education (hereinafter referred to as "the Project") signed on October 8<sup>th</sup> between Ministry of Education and Technical Education (hereinafter referred to as "MOETE") and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA held a series of discussions with MOETE and relevant organizations to develop a detailed plan of the Project.

Both parties agreed the details of the Project and the main points discussed as described in the Appendix 1 and the Appendix 2 respectively.

Both parties also agreed that MOETE, the counterpart to JICA, will be responsible for the implementation of the Project in cooperation with JICA, coordinate with other relevant organizations and ensure that the self-reliant operation of the Project is sustained during and after the implementation period in order to contribute toward social and economic development of Arab Republic of Egypt.

The Project will be implemented within the framework of the Agreement on Technical Cooperation signed on 15<sup>th</sup> June 1983 (hereinafter referred to as "the Agreement") and the Note Verbales exchanged on 17<sup>th</sup> May 2016 between the Government of Japan (hereinafter referred to as "GOJ") and the Government of Arab Republic of Egypt (hereinafter referred to as "GOE".)

Appendix 1: Project Description

Appendix 2: Minutes of Meetings on the Detailed Planning Survey

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**PROJECT DESCRIPTION**

**I. BACKGROUND**

On the occasion of the official visit to Japan by H.E.Mr.Abdel-Fattah El-Sisi, President of the Arab Republic of Egypt, in February 2016, both countries officially announced the importance of their joint partnership on education: Egypt-Japan Education Partnership "EJEP" to cooperate in the area of education including early childhood, basic, technical and higher education. This project is conducted, on the basis of and as part of this solid partnership, to introduce Japanese style technical educational approach for improving discipline, team work, basic hard skills, and basic soft skills in technical secondary education in Egypt.

**II. OUTLINE OF THE PROJECT**

Details of the Project are described in the Logical Framework (Project Design Matrix: PDM) (Annex 1) and the Plan of Operation (Annex 2).

**1. Project Title**

The project for enhancement of technical secondary education

**2. Expected Goals which will be attained after implementing the Proposed Plan**

The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school.

**3. Outputs**

**Output 1.**

School management at pilot schools is improved through introducing Japanese style school management systems.

**Output 2.**

Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.

**Output 3.**

Local companies and pilot schools are cooperating with each other.

**Output 4.**

A new model school that introduces Japanese style technical education is in operation.

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#### 4. Activities

- 1-1. The organizational framework of the pilot schools is improved.
- 1-2. Teachers and management positions of the pilot schools are trained based on Japanese style discipline, to improve school management.
- 1-3. Pilot schools develop and implement action plans to improve student discipline in the school.
- 1-4. Pilot schools maintain and continue the improved conditions based on the action plan.
- 1-5. Pilot schools conduct an effective verification on student discipline.
- 1-6. Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effective verification results.
  
- 2-1. Pilot schools select a practical subject, based on discussions with partner companies, to be improved through model activities.
- 2-2. Training for teachers of the selected practical subject is conducted.
- 2-3. Pilot schools introduce trial practical education to improve students' basic hard skills and soft skills through cooperation with partner companies.
- 2-4. Pilot schools conduct improved practical education.
- 2-5. Pilot schools conduct impact verification.
  
- 3-1. Pilot schools establish the Work Transition Unit.
- 3-2. The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data) based on Japanese style career guidance.
- 3-3. The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainer, and/or practical training at the companies, by collaboration with local partner companies.
  
- 4-1. Technical advice necessary for establishing a new model school that introduces Japanese style technical education is provided.
- 4-2. The new model school selects a practical subject, based on discussions with the partner company, to be improved through model activities.
- 4-3. Equipment necessary for the new model school to improve practical training of the selected subject is prepared.
- 4-4. The new model school develops organizational framework, including the Work Transition Unit, to manage model activities.
- 4-5. Training for teaching and management level staff, of the new model school on improvement of school management is conducted.
- 4-6. The new model school plans and implements initial activities to improve school management so as to enhance students' discipline.
- 4-7. The new model school maintain improved conditions and continues activities.

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- 4-8. The new model school conducts effective verification on students' discipline.
- 4-9. Training for teachers of the selected practical subject is conducted.
- 4-10. The new model school introduces practical education to improve students' basic hard skills and soft skills.
- 4-11. The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data).
- 4-12. The new model school tries to introduce model practical education such as final year project work in order to become a local model for technical secondary schools.

## 5. Input

### (1) Input by JICA

#### (a) Dispatch of Experts

- Co-director
- Chief Advisor
- School Management
- School Industry Partnership
- Training Planning Management and Coordination
- Industrial Training (tentatively Electrical & Electronics and Mechanical)

#### (b) Local staff

- Local administrative coordinator

#### (c) Training in Japan

#### (d) Teaching and learning materials for the pilot activities at pilot schools

#### (e) Minimum equipment necessary for conducting the model activities at the pilot department of the new model school (equipment on the list of MOETE standard equipment)

#### (f) Other essential operations for implementing the Project

#### (g) Machinery and Equipment

In case of importation, the machinery, equipment and other materials under 11-5 (1) e. above will become the property of the MOETE upon being delivered C.I.F. (cost, insurance and freight) to the Egyptian authorities concerned at the ports and/or airports of disembarkation.

### (2) Input by MOETE

MOETE will take necessary measures to provide at its own expense:

#### (a) Counterpart Personnel (C/P)

- Project Director (Director of Project Management Unit, PMU)
- Project Coordinator
- Director of Technical Education in Pilot Modereya Offices
- Other administrative staff
- Drivers

#### (b) Facilities and equipment

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- Office space and necessary facilities and equipment for JICA experts
- (c) Supply or replacement of machinery, equipment, instruments, tools, spare parts and any other educational materials necessary for the implementation of the Project other than the equipment provided by JICA;
- (d) Training materials for the pilot schools
- (e) Office and stationery supplies and materials for the pilot schools for Pilot Activities
- (f) Trainings cost (travel allowance of C/Ps and teachers, venue fee, etc)
- (g) Incentives for extended working hours of teachers
- (h) Other essential costs
- (i) Furniture and equipment for the pilot schools and the target schools
- (j) Credentials or identification cards to enter MOETE's premises and schools
- (k) Available data (including maps and photographs) and information related to the Project only for the Project use under MOETE guidance
- (l) Running expenses necessary for the implementation of the Project in MOETE's premises such as electricity, water and internet
- (m) Expenses necessary for transportation within Egypt of the equipment referred to in II-5 (1) as well as for the installation, operation and maintenance thereof; and
- (n) Necessary facilities for the JICA experts for the remittance as well as utilization of the funds introduced into Arab Republic of Egypt from Japan in connection with the implementation of the Project

#### 6. Implementation Structure

The project organization chart is given in the Annex 3. The roles and assignments of relevant organizations are as follows:

##### (1) MOETE

- Project Director  
Head of Technical Education Sector, MOETE
- Project Coordinator
- Counterpart Personnel  
Director of Technical Education in pilot/target Modereya Offices Other administrative staff

##### (2) JICA Experts (Short Term and Long Term)

The JICA experts will give necessary technical guidance, advice and recommendations to MOETE on any matters pertaining to the implementation of the Project.

##### (3) Joint Coordinating Committee

Under the Steering Committee of Egypt-Japan Education Partnership (EJEP), the Executive Committee 1 (hereinafter referred to as EC1), composed of relevant high-ranking stakeholders from both governments, has been set up. The main mandate of EC1 is to oversee preparation, coordination, implementation, and follow-up of the components of the Project. EC1 also

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approves the annual work plan, reviews the progress, revises the overall plan when necessary, conducts monitoring and evaluation of the project, and will exchange opinions on major issues that arise during the implementation of the Project. EC1 will hold regular meetings when it deems necessary.

The list of stakeholders is given in the Annex 4

#### **7. Project Sites and Beneficiaries**

- (1) The Project sites will be Port Said and near Cairo Area (pilot schools to be determined)
- (2) Beneficiaries will be students and teachers in pilot schools in above mentioned area.

#### **8. Duration**

The duration of the Project will be approximately 4 years from the date when the first Japanese expert(s) for the Project arrives in Egypt.

#### **9. Reports**

MOETE and JICA experts will jointly prepare the following reports in English.

- (1) Monitoring Sheet on semiannual basis until the project completion
- (2) Project Completion Report at the time of project completion

#### **10. Environment and Social Considerations**

Whereas MOETE and JICA will abide by "JICA Guidelines for Environmental and Social Considerations" in order to ensure that appropriate considerations will be made for the environmental and social impacts of the Project, the Project has been classified as a Category C project and needs no more consideration processes on this matter

### **III. UNDERTAKINGS OF MOETE**

MOETE will take necessary measures to support the smooth implementation of the Project within the framework of the Agreement on Technical Cooperation signed on 15th June 1983 between GOJ and GOE.

### **IV. MONITORING AND EVALUATION**

JICA and MOETE will jointly and regularly monitor the progress of the Project through the Monitoring Sheets based on the Project Design Matrix (PDM) and Plan of Operation (PO). The Monitoring Sheets will be reviewed every six (6) months.

Also, Project Completion Report shall be drawn up one (1) month before the termination of the Project.

JICA will conduct the following evaluations and surveys to mainly verify sustainability and impact of the Project and draw lessons. The Egyptian side is required to provide necessary support for them.

- (1) Ex-post evaluation three (3) years after the Project completion, in principle
- (2) Follow-up surveys on necessity basis

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**V. PROMOTION OF PUBLIC SUPPORT**

For the purpose of promoting support for the Project, MOETE will take appropriate measure to make the Project widely known to the people of Egypt.

**VI. MISCONDUCT**

If JICA or MOETE receives reports related to suspected corrupt or fraudulent practices in the implementation of the Project, JICA or MOETE and relevant organizations will provide the other party with such details, as the other party may reasonably request, including those related to any concerned personnel of the contractor, consultant, government, and/or public organizations.

The person and/or company which shall report such corrupt or fraudulent practices in the implementation of the project shall be granted fair and favorable treatment by the concerned authorities, in accordance with its respective applicable national laws and regulations.

**VII. MUTUAL CONSULTATION**

JICA and MOETE will consult each other whenever major issues arise in the course of Project implementation.

**VIII. AMENDMENTS**

The record of discussions may be amended by the minutes of meetings between JICA and MOETE. However, PO may be amended in the Monitoring Sheets.

The minutes of meetings will be signed by authorized persons of each side who may be different from the signers of the record of discussions.

Annex 1 Project Design Matrix

Annex 2 Plan of Operation

Annex 3 Implementation Structure

Annex 4 List of Stakeholders

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## Annex 1: Project Design Matrix

Project name : The Project for Enhancement of Technical Secondary Education

Duration : Approximately 4 years from the date when the first Japanese expert(s) for the Project arrives in Egypt, Target Group: Technical secondary schools

Narrative Summary	Objectively Verifiable Indicators	Meas of Verification	Important Assumptions
<p><b>Overall Goal</b> The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt.</p> <p><b>Project Purpose</b> The model activities for technical secondary schools that introduce Japanese style technical education are established at pilot schools and a new model school'.</p>	<ul style="list-style-type: none"> <li>The number of technical secondary schools that have introduced the model activities.</li> <li>Satisfaction of industries with graduates from the technical secondary schools that have introduced the model activities</li> </ul>	Survey done by the project	
<p><b>Outputs</b></p> <ol style="list-style-type: none"> <li>School management at pilot schools is improved through introducing Japanese style school management systems.</li> <li>Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.</li> <li>Local companies and pilot schools are cooperating with each other.</li> <li>A new model school that introduces Japanese style technical education is in operation.               <ol style="list-style-type: none"> <li>Model activities are conducted at pilot schools, which are already operated, and at a new model school that is to be prepared by the Egyptian side.</li> <li>Hard skills is defined by the Project as specific and teachable abilities, including: 1) Basic skills (single basic skills, learnt through basic practical training); 2) High-level skills (ability to utilize high-level equipment); and 3) Applied skills (ability to make a product by oneself, utilizing a broad set of knowledge, skills, and etc.).</li> <li>Soft skills is defined by the Project as interpersonal skills, such as work attitudes to improve the precision of the job, knowledge of safety, team work, 5S (sort, set in order, shine, standardize, and sustain), and etc</li> </ol> </li> </ol>	<ul style="list-style-type: none"> <li>Satisfaction of students with the classes given at the technical secondary schools that have introduced the model activities (e.g. whether the class is easy-to-follow, whether the class is punctually given, and etc.)</li> <li>The number of graduates who pursued and obtained a job at the technical secondary schools that have introduced the model activities</li> <li>The number of action plans for enhancing model activities developed by the technical secondary schools that have introduced the model activities</li> </ul>	Records in the pilot schools Survey done by the project	<ul style="list-style-type: none"> <li>MOETE continues to work towards enhancing and maintaining motivation of pilot school principals to improve current conditions at schools.</li> <li>The socioeconomic conditions do not worsen.</li> <li>Educational policies in the technical education sector do not change.</li> <li>Economic performance and recruitment plans in local partner companies do not worsen drastically.</li> <li>A new technical secondary school, which is to be used as a model for introducing Japanese style technical education, is to be established under auspice of MOETE in cooperation with industry.</li> </ul>
<ol style="list-style-type: none"> <li>School management at pilot schools is improved through introducing Japanese style school management systems.               <ol style="list-style-type: none"> <li>1-1 Activities conducted for improving school management (e.g. frequency of teachers' meetings, information visualization, and development of filing systems)</li> <li>1-2 Improvement of teachers' and students' punctuality at pilot classes</li> <li>1-3 A guideline on school management of each pilot school</li> </ol> </li> <li>Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.               <ol style="list-style-type: none"> <li>2-1 Improvement of students' basic hard skills</li> <li>2-2 Improvement of students' soft skills</li> </ol> </li> </ol>		Records in the pilot schools Survey done by the project	
<ol style="list-style-type: none"> <li>Local companies and pilot schools are cooperating with each other.               <ol style="list-style-type: none"> <li>3-1 The record of graduates' placement</li> <li>3-2 The record of recruitment information from local industries at the pilot schools</li> <li>3-3 The number of training and internship programs in partner companies, and study visits to local companies</li> </ol> </li> <li>A new model school that introduces Japanese style technical education is in operation.               <ol style="list-style-type: none"> <li>4-1 Japanese style school management of the new model schools</li> </ol> </li> </ol>		Survey done by the project	

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Activities	Inputs
1-1 The organizational framework of the pilot schools is improved.	✓ <u>1. Japanese side</u>
1-2 Teachers and management positions of the pilot schools are trained, based on Japanese style discipline, to improve school management.	✓ Expert
1-3 Pilot schools develop and implement action plans to improve student discipline in the school.	✓ Co-director
1-4 Pilot schools maintain and continue the improved conditions based on the action plan.	✓ Chief Advisor
1-5 Pilot schools conduct effective verification on student discipline.	✓ School Management
1-6 Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effect verification results.	✓ School Industry Partnership and Training Planning Management and Coordination
2-1 Pilot schools select a practical subject, based on discussions with partner companies, to be improved through model activities.	✓ Industrial Training (tentatively Electrical & Electronics, and Mechanical)
2-2 Training for teachers of the selected practical subject is conducted.	✓ Local staff
2-3 Pilot schools introduce trial practical education to improve students' basic hard skills and soft skills through cooperation with partner companies.	✓ Interpreter
2-4 Pilot schools conduct improved practical education.	✓ Local administrative coordinator
2-5 Pilot schools conduct effective verification.	✓ Training in Japan
3-1 Pilot schools establish the Work Transition Unit	✓ Teaching and learning materials for the pilot schools
3-2 The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data) based on Japanese style career guidance.	✓ Minimum equipment necessary for conducting the model activities at the pilot department of the new model school (equipment on the list of MOETE standard equipment)
3-3 The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainers, and/or practical training at the companies, by collaboration with local partner companies.	✓ Other essential operations for implementing the project
4-1 Technical advice necessary for establishing a new model school that introduces Japanese style technical education is provided.	✓ <u>2. Egyptian side</u>
4-2 The new model school selects a practical subject, based on discussions with the partner company, to be improved through model activities.	✓ Counterpart Personnel
4-3 Equipment necessary for the new model school to improve practical training of the selected subject is prepared.	✓ Project Director (Director of PMU)
4-4 The new model school develops organizational framework, including the Work Transition Unit, to manage model activities in the new model school.	✓ Project Coordinator
4-5 Training for teaching and management level staff, of the new model school on improvement of school management is conducted.	✓ Director of Technical Education in pilot Idara and Modereya Offices
4-6 The new model school plans and implements initial activities to improve school management so as to enhance students' discipline.	✓ Other administrative staff
4-7 The new model school maintains improved conditions and continues activities	✓ Drivers
4-8 The new model school conducts effective verification on students' discipline.	✓ Facilities
4-9 Training for teachers of the selected practical subject is conducted.	✓ Office space and necessary facilities for JICA experts
4-10 The new model school introduces practical education to improve students' basic hard skills and soft skills.	✓ Training materials for the pilot schools
4-11 The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data)	✓ Office and stationery supplies materials for the pilot schools
4-12 The new model school tries to introduce model practical education such as final year project work in order to become a local model for technical secondary schools.	✓ Trainings costs (travel allowance of C/Ps and teachers, venue fee, etc.) ✓ Incentives for the pilot school teachers ✓ Other essential costs

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## Annex 2 Plan of Operation

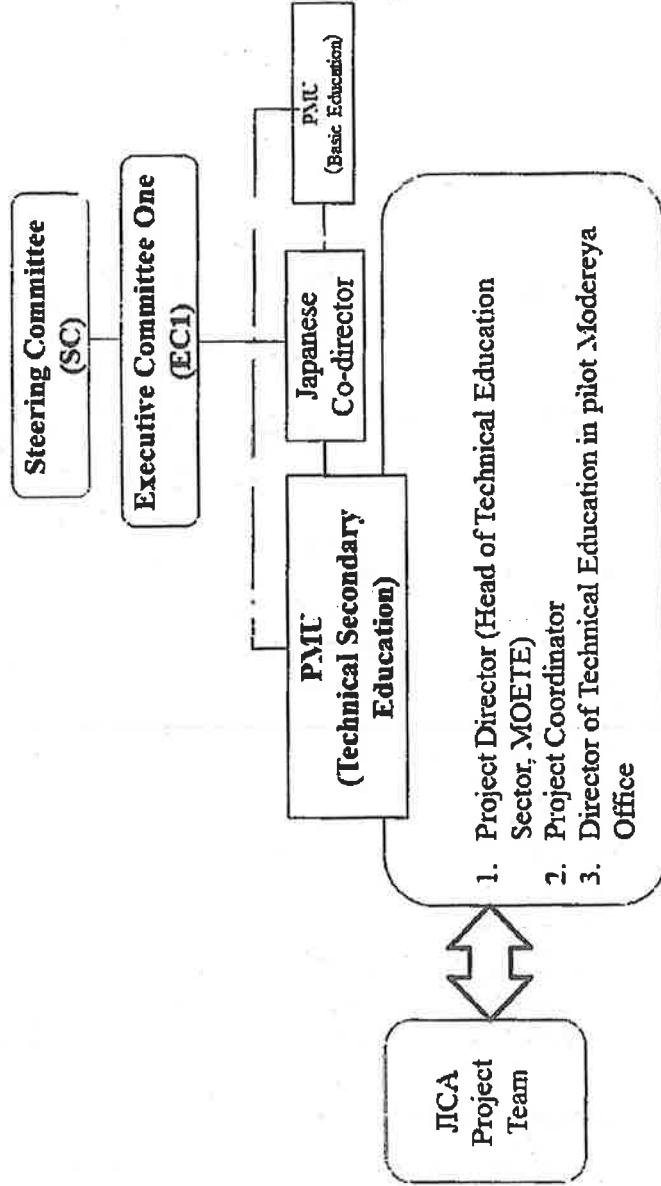
Project Name: The Project for Enhancement of Technical Secondary Education

No	Activities	2017			2018				2019				2020				
		2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
Project Period		[Timeline bars for Project Period]															
School Semester		[Timeline bars for School Semester]															
<b>Output 1. School management at pilot schools is improved through introducing Japanese style school management systems.</b>																	
1-1	The organizational framework of the pilot schools is improved	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
1-2	Teachers and management positions of the pilot schools are trained to improve school management	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
1-3	Pilot schools develop and implement action plans to improve student discipline in the school	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
1-4	Pilot schools maintain and continue the improved conditions based on the action plan.	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
1-5	Pilot schools conduct effective verification on student discipline	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
1-6	Each pilot school develops a guideline to introduce necessary activities for improving student discipline based on the effect verification results	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>Output 2. Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools.</b>																	
2-1	Pilot schools select a practical subject to be improved through model activities	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
2-2	Training for teachers of the selected practical subject is conducted	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
2-3	Pilot schools introduce trial practical education to improve students' basic hard skills and soft skills	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
2-4	Pilot schools conduct improved practical education	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
2-5	Pilot schools conduct effective verification	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>Output 3. Local companies and pilot schools are cooperating with each other.</b>																	
3-1	Pilot schools establish the Work Transition Unit	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
3-2	The Work Transition Unit in pilot schools conducts activities necessary for improving employment rates (e.g. to collect and record local industries' data)	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
3-3	The Work Transition Unit in pilot schools coordinates internship programs, lectures by the companies' trainers and/or practical training at the companies, by collaboration with local partner companies	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
<b>Output 4. A new model school that introduces Japanese style technical education is in operation.</b>																	
4-1	Technical advice necessary for establishing a new model school is provided	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-2	The new model school selects a practical subject to be improved through model activities	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-3	Equipment necessary for the new model school to improve practical training of the selected subject is prepared	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-4	The new model school develops organizational framework including the Work Transition Unit, to manage model activities at the new model school	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-5	Training for teaching and management level staff of the new model school on improvement of school management is conducted	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-6	The new model school plans and implements initial activities to improve school management so as to enhance students' discipline	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-7	The new model school maintains improved conditions and continues activities	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-8	The new model school conducts effective verification on students' discipline	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-9	Training for teachers of the selected practical subject is conducted	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-10	The new model school introduces practical education to improve students' basic hard skills and soft skills	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-11	The Work Transition Unit of the new model school implements activities necessary for enhancing industrial cooperation (e.g. to collect and record local industries' data)	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]
4-12	The new model school try to introduce model practical education such as final year project work in order to become a local model for technical secondary schools	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]

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### Implementation Structure



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List of Stakeholders

- i) The Minister of Education and Technical Education will preside over this Executive Committee. In case of his absence, the Coordinator of the Steering Committee will chair and coordinate between the Steering Committee and this Executive Committee.
- ii) The members of the Egyptian side are high-ranking officials from the Ministry of Education and Technical Education, the Ministry of Higher Education, the Ministry of International Cooperation and the Ministry of Foreign Affairs. Other representative from relevant ministries and experts can be invited when necessary.
- iii) The members of the Japanese side are the Economic Counsellor of the Embassy of Japan and Chief Representative of JICA Egypt Office. Japanese experts can be invited when necessary.

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## **Appendix 2**

# **Japanese Experts Deployment Result**



Appendix 2 : 専門家派遣実績/Japanese Experts Deployment Result

	担当分野・氏名	Technical Area/Name	計画・実績 Plan/Actual	現地作業 Field MM	国内作業 Home MM	合計 Total
1	総括／研修計画1 南雲 達也	Chief Advisor/Training Planning Management and Coordination 1 NAGUMO Tatsuya	計画 Plan	19.00	7.73	26.73
			実績 Actual	19.33	7.70	27.03
2	研修計画2 石原 (鈴木) 加奈子	Training Planning Management and Coordination 2 ISHIHARA (SUZUKI) Kanako	計画 Plan	5.47	0.55	6.02
			実績 Actual	5.47	0.55	6.02
3	企業連携 石橋 徹	School Industry Partnership ISHIBASHI Toru	計画 Plan	6.97	5.00	11.97
			実績 Actual	6.97	5.00	11.97
4	機械 宮本 滋	Industrial Training (Mechanical) MIYAMOTO Shigeru	計画 Plan	9.07	1.91	10.98
			実績 Actual	9.07	1.91	10.98
5	学校運営1／電気電子 關 敏昭	School Management 1/ Industrial Training (Electrical & Electronics) SEKI Toshiaki	計画 Plan	11.47	0.90	12.37
			実績 Actual	11.47	0.90	12.37
6	学校運営2／研修計画2_交代 大原 理依子	School Management 2/ Training Planning Management and Coordination 2 OHARA Rieko	計画 Plan	21.10	8.28	29.38
			実績 Actual	20.77	8.91	29.68
7	研修企画 高木 宏美	Training Planning TAKAGI Hiromi	計画 Plan	0.00	1.90	1.90
			実績 Actual	0.00	1.90	1.90
8	服飾 柳内 麗美	Industrial Training (Ready Made Garment) YANAI Remi	計画 Plan	4.77	0.20	4.97
			実績 Actual	4.30	0.67	4.97
9	機械_交代 永井 多聞	Industrial Training (Mechanical) NAGAI Tamon	計画 Plan	3.40	0.10	3.50
			実績 Actual	1.67	1.23	2.90
10	電気/コンピュータ 木村千良	Industrial Training (Electricity/Computer) KIMURA Kazuyoshi	計画 Plan	1.93	4.05	5.98
			実績 Actual	0.00	5.98	5.98
累計 Total			計画 Plan	<b>83.18</b>	<b>30.62</b>	<b>113.80</b>
累計 Total			実績 Actual	<b>79.05</b>	<b>34.75</b>	<b>113.80</b>

# **Appendix 3**

## **List of Equipment**

## Appendix 3: 機材リスト/List of Equipment

物品名称 Item	規格・品番 Model Number	個数 Qty	取得価格 Value			取得日 Purchase date	配置場所 Place of use	現況 Status
			取得価格 Value	通貨 Currency	日本円換算 取得価格 JPY equivalent			
ラップトップPC Laptop PC	DELL 5559 Core i7	1	12,000	EGP	73,314	2017/4/9	教育・技術教育省 MOETE	稼働中 In use
Xerox複合機 Xerox multifunction copy machine	Xerox 8055	1	138,000	EGP	866,739	2017/12/7	基礎教育担当PMU執務室 office of the PMU of the basic education	稼働中 In use
旋盤 Lathe	CY6240	1	220,020	EGP	1,332,316	2018/3/13	O校 School O	稼働中 In use
全自動チャイム Fully automatic bell	Central unit (Smart bell system with 3.2" TFT color LCD)	1	1024.29	USD	111,842	2018/5/18	P校 School P	稼働中 In use
全自動チャイム Fully automatic bell	Central unit (Smart bell system with 3.2" TFT color LCD)	1	1024.29	USD	111,842	2018/5/18	A校 School A	稼働中 In use
全自動チャイム Fully automatic bell	Central unit (Smart bell system with 3.2" TFT color LCD)	1	1024.29	USD	111,842	2018/5/18	T校 School T	稼働中 In use
全自動チャイム Fully automatic bell	Central unit (Smart bell system with 3.2" TFT color LCD)	1	1072.17	USD	120,299	2018/11/20	EA校 School EA	稼働中 In use
全自動チャイム Fully automatic bell	Central unit (Smart bell system with 3.2" TFT color LCD)	1	1352	USD	149,292	2019/4/13	O校 School O	稼働中 In use
ボール盤 Bench drilling machine	Eastar ETD-13	2	118,800	EGP	808,274	2019/9/16	EA校 School EA	稼働中 In use

## **Appendix 4**

### **Bound Version of “Guideline for Practical Lesson Improvement” (English/Arabic)**

Ministry of Education and Technical Education  
Arab Republic of Egypt

Guideline for Practical Lesson  
Improvement  
~ Focusing on Repetitive  
Instructions ~

Aug 2019



## Preface

The Ministry of Education and Technical Education (MOETE) in Egypt has embarked on the transformation of Egypt's K-12 education system, called Education 2.0, from September 2018 with KG1, KG2 and Primary 1 continuing to be rolled out year after year until 2030. We are transforming the way in which students learn to prepare Egypt's youth to succeed in a future world that we cannot entirely imagine. The design underpinnings of the Education 2.0 is based on the constitution, which prioritizes the need to "build the character" of Egyptian children, develop their scientific and critical thinking skills, enhance their values, instill a deep sense of citizenship and develop tolerance and understanding of diversity.

One of Egypt's greatest resources is the potential of its workforce. Hence, a parallel transformation of TVET becomes a matter of great national importance in order to ensure that this type of education becomes an attractive choice for graduates of the new Education 2.0 in 2027. Therefore, the MOETE is embarking on transformation of technical education (Technical Education 2.0) as well from September 2019.

In the Technical Education 2.0, the MOETE aims to equip students with three competencies; 1) Vocational Competencies, 2) Academic and Cultural Competencies and 3) Lifelong skills. To realize 1) Vocational Competencies, which are key competencies at technical secondary schools, the MOETE developed this guideline in collaboration with Japan, by referring Japanese Technical Education Model. By introducing this guideline at each school, technical secondary school would become an attractive choice for young generations as well as their guardians.

I request everyone of us to join hands towards this goal of transforming Egypt through technical education in order to restore Egyptian excellence, leadership and great civilization.

My warmest regards to our children who will begin this journey and my deepest respect and gratitude to our great teachers.

Dr. Tarek Galal Shawki  
Minister of Education & Technical Education

## **Acknowledgement**

MOETE is very proud to present this guideline, with the accompanying video learning materials. This is the result of much consultation, much thought and a lot of works.

MOETE would like to express deep appreciation to its own “Project Management Unit” of the “Project for Enhancement of Technical Secondary Education”, which has been implemented since April 2017 under the collaboration between MOETE and Japan International Cooperation Agency (JICA). MOETE is also very grateful to the minister’s advisors for technical education. Our deep appreciation goes to our pilot schools where the trials of the guidelines were done (Ahmed Zeweil School, Port Said Secondary Industrial School, El Tahrir School, Obour Industrial Secondary School and Al Araby School for Applied Technology), our local education offices (Port Said Mudiriya, North Port Said Idara, Kalyoubia Mudiriya and Obour Idara) and our partner companies (El-Araby, Unicharm and Sumitomo Electric Wiring Systems, Inc). Finally, I thank each one of MOETE’s administrator as well as of its subject counselors, who participated in this endeavor together .



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## Purpose of This Guideline

This guideline indicates “basic hard skills and soft skills that students should acquire in their school days” as “Competency”. This guideline aims to help principals and teachers at technical secondary schools, especially industrial secondary schools, understand competencies that students should acquire in their school days and shows the methods of practical lesson improvement to achieve this goal.

## Structure and Audience of This Guideline

The aim of this guideline is to improve the quality of practical lessons; however, the targeted audience is not only practical teachers, but also all school staff of technical secondary schools and Idara/Mudiriya affiliated with technical secondary schools. This guideline consists of 7 chapters. Chapters 2, 3 and 4 target the practical teachers while other chapters target all teachers. Chapter 6 is required reading especially for WTU responsible staff.

The target audiences for each chapter in this guideline are summarized in the table below:

<b>Chapter</b>	<b>School</b>	<b>Idara/Mudiriya</b>
Chapter 1	All school staff	All staff affiliated with technical secondary schools
Chapter 2	Practical teachers	Supervisor
Chapter 3	Practical teachers	Supervisor
Chapter 4	Practical teachers	Supervisor
Chapter 5	All school staff	All staff affiliated with technical secondary schools
Chapter 6	All school staff ( Especially WTU)	All staff affiliated with technical secondary schools
Chapter 7	All school staff	All staff affiliated with technical secondary schools

## Description of the icon in the Guideline

The following icons are placed in the guidelines to make it easy for readers to understand.



### **Tips:**

This icon indicates tips for implementing basic activities (information or “keys” useful for successful implementation). Using the information and techniques after this mark allows you to effectively implement the activities in this guideline.



### **Display and communication:**

This icon describes the contents to be communicated to the students and the ways to communicate and display them to explain clearly to conduct practical lessons in accordance with the guideline.



### **Example:**

This icon illustrates an example of what you can do depending on the situation of your school/department as activities of the guideline. With reference to this, each teacher must implement the activities with contents adjusted according to each school.



### **Cost:**

This icon indicates items used to implement basic activities. With reference to this, each teacher will be able to gain some idea of cost.



**Advance**

### **Advance:**

This icon indicates activities to do after the basic activities are achieved.



### **Documents to keep :**

This icon indicates documents, etc. that should be kept when basic activities are implemented.



### **Persons concerned and their roles:**

This icon indicates the positions and roles associated with the implementation of the basic activities.



### **Assessment by the principal:**

This icon indicates the contents that the principal responsible for implementing the basic activities should understand. It is advisable that Mudiriyya and Idara also check this item when monitoring.

# Chapter 1. What Students Learn in Technical Secondary Schools

## 1.1 Four Competencies That Students Should Acquire

In conventional curriculums of technical secondary schools, “Knowledge” is taught in theoretical lessons and “Skills” are taught in practical lessons; however, in addition to those knowledge and skills, students are required to acquire “a sense of purpose and attitude to act independently”.

In the industry, having knowledge and skill are not enough to be useful. For example, having knowledge on how to operate a machine tool such as a drilling machine doesn’t necessarily mean that the product will meet the accuracy required by the client. Industry seeks talents who have a sense of purpose and attitude to always perform work to satisfy the accuracy required by the client by utilizing knowledge and skills based on the knowledge. The person who has these knowledge, skill and sense of purpose and attitude to perform using the knowledge and skills is called a person with competency.

### Competency is to have a combination of:

- **Knowledge**
- **Skills based on the knowledge**
- **Sense of purpose and attitude to perform using the knowledge and skills**

**To do something.**

There are various types of Competency; however, technical secondary schools should aim to focus instruction mainly on the following four Competencies required by companies and have students acquire them through practical lessons.

### Four Main Competencies

- **PR: Production according to request**
- **SB: Safe Behavior**
- **3S: Sort/Set in Order/Shine**
- **TM: Time Management**

The competencies that should be acquired as a professional mainly fall under “PR: Production according to request”. The relationship between the four competencies can be considered as “PR: Production according to request” being at the center to secure the quality of work, and the three other competencies acting as elements to guarantee and promote quality. Consequently, even with high competency of PR, a graduate will not be valued in the industry without the three other competencies.

For example, a factory worker failing to practice safe behavior may cause a serious accident. Even if a person has the knowledge, skills and attitude to practice safe behavior, if he or she is late for a meeting and misses the discussion on precautions, there will be a higher risk of a serious accident. If a serious accident occurs, it would mean a significant impact on quality and delivery schedule.

Thus, the four competencies mutually complement one another, and a person excessively lacking in the mastery of even one of them is not qualified as a “high-quality technician”. Teachers must raise the students’ awareness on the importance and the interrelated nature of the four competencies, and conduct lessons including a focus on strengthening these competencies.

Expected Learning Outcome

Teachers shall provide instructions to students so that they are able to reach the following performance levels with respect to the four competencies

<b>Competency</b>	<b>Expected Performance Level (Learning Outcome)</b>
<b>PR:</b> Production according to Request	Independently perform the basic steps (check requirements – work – confirm results) in order to produce work according to requests.
<b>SB:</b> Safe Behavior	Independently perform safe behavior to ensure safety at corporate manufacturing sites.
<b>3S:</b> Sort/ Set in Order/ Shine	Independently perform sort/set in order/shine at the workshop to increase product quality and to enable work efficiency.
<b>TM:</b> Time Management	Independently perform time management expected at companies.

**1.2 Repetitive Practice and Repetitive Instruction to enable students to acquire Competency**

“Knowledge” and “skills” are taught in conventional curriculums. In addition, “a sense of purpose and an attitude to act independently” is also necessary. With the combination of these three elements, having the students do “repetitive practice” and giving them “repetitive instruction” enable the knowledge and skills to take root and the students to acquire the competency. In this guideline, the methods of enabling repetitive practice for students and repetitive instructions by teachers are explained from the next chapter.

**Fostering a sense of purpose:**

In order to foster a sense of purpose in students, it is necessary that teachers repeatedly explain to the students in class why Competency is important. This is because a sense of purpose will grow as the students themselves understand and appreciate what kind of benefits they would be able to enjoy by acquiring Competency. Students who wish to go to college will also be serious about learning Competencies once they find that they will need these Competencies even after graduating college.

For giving instructions to students on Competency, it is necessary that teachers fully understand Competencies demanded in the industry. Therefore, schools need to cooperate with companies. Partnership with companies is to be discussed in Chapter 6.

### **1.3 When to Implement Repetitive Practice**

Repetitive practice is possible for all competencies at practical lessons. However, time management (punctuality) can also be practiced outside practical lessons. If students form the habit of “not practicing time management (punctual) behavior” outside of practical lessons, they will also not practice time management (be punctual) for practical lessons. For this reason, time management must be instructed throughout the students’ time at school. In this guideline, the description of each competency, what the school and teachers must do when first introducing this guideline, and how to implement repetitive practice (repetitive instructions) are described in chapters 2 to 5.

#### **When repetitive practice can be implemented**

<b>Competency</b>	<b>Scene 1) Practical lessons</b>	<b>Scene 2) General lessons</b>	<b>Chapter in this guideline</b>
PR: Production according to request	✓		Chapter 2
SB: Safe behavior	✓		Chapter 3
3S: Sort/set in order/shine	✓		Chapter 4
TM: Time management	✓	✓	Chapter 5

#### **1.4 Relationship with the Current Curriculum**

The instruction methods based on this guideline are implemented in line with the current curriculum and textbooks. However, the methods include more activities of repetitive practice and repetitive instructions that aim to have students acquire the four competencies.

#### **1.5 Building a Career Path**

Through instruction on the four competencies, the school must show how the students can build their careers in society equipped with these competencies. However, this guideline does not show how to implement career path education. Therefore, the guideline puts emphasis that school make partnership with companies and grasp companies' needs to make sure that students understand how the four competencies will be useful in industry after graduating from school.






## Chapter 2. Implementing Repetitive Practice for PR: Production according to Request

### 2.1 Description of Competency

Description: Independently perform the basic steps (check requirements—work—confirm results) in order to produce work according to requests.

Detail:

The “**basic steps**” (check requirements –work – confirm results) are necessary to produce the work according to request. To understand the requirements given (specifications) and make products exactly as required is a basic skill required by industry; a technician who cannot make products according to requirements (specifications) may end up losing their hard-earned job. Teachers should inform this to make sure that the students understand and appreciate the importance of the competency, and practice these basic steps.

<p><b>STEP1: Check requirements</b></p> 	<p>For any work in the industry, there are always requirements. Therefore, a person who makes products must check what the requirement is first.</p>
<p><b>STEP2: Work</b></p> 	<p>Work is performed to achieve the requirements. A skilled professional is able to identify the machinery/equipment, tools, and materials necessary to meet the requirements, but this would not be possible for a technical secondary school student. Therefore, teachers must provide appropriate machinery/equipment, tools, and materials to the students, with an explanation on why those were selected for the work. What the students learn here will come into use in the future, after they graduate and gain experience in the industry.</p>
<p><b>STEP3: Confirm results</b></p> 	<p>Once work is done, make sure the results of the work are confirmed. In most cases, confirmation is made through measurement. If measurements show that the standard of requirements are not met, the student must go back to work again. Work and confirmation are repeated until the results meet the requirements.</p>

Conventional practical lessons have also included instructions on these basic steps. However, in this guideline, how to make the students repeatedly practice these basic steps is the focus.

## 2.2 Preparation for Instructions

### (1) Practical Lesson Plan

Teachers redesign the practical lesson plans to allow students to experience more repetitive practice of the basic steps.



#### **Tips for making a practical lesson plan :**

**Small group:** To increase repetitive practice of the basic steps, it is necessary to have more students actually engage in work for a longer time. For this reason, introduce practical lessons with small groups. This decreases the number of students who use equipment /tools at the same time, and the time of exposure for using equipment/tools per student increases. With more equipment/tools than the number of students in one group, it is possible to ensure that each student has a greater opportunity to do repetitive practice of the basic steps. The number of students for one group is recommended at around four to ten, which is about the size in which a teacher is able to keep an eye on each student. Once groups are formed, it is desirable to continue with the same group for the year, in part to avoid confusion. Three constraining conditions must be considered when forming the groups: the number of equipment, the number of teachers, and the topic of the practical lesson.

**Order of topics :** Students cannot understand advanced concepts when they have not established basic knowledge or basic skills. Ideally, students should first learn the basic knowledge and skills before moving on to more advanced topics.

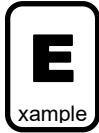
**Students' basic academic level :** The level that can be achieved in practical lessons will be higher if the students have a strong understanding of the theory. Understanding of the theory is dependent on the students' basic academic level. Therefore, teachers should have a good grasp of the students' basic academic level before the lesson on theory, and utilize it to decide the complexity of practical lesson (ex. the numbers of resistance elements used for electronics practical lessons) and the time necessary for each practical lesson.



#### **Communicating to students :**

Learning is more effective when the students understand the purpose of the practical lessons because they will be able to work on the practical lessons with a sense of purpose. Therefore teachers should communicate the practical lesson plan to students before starting the lesson. It is recommended that the plan is displayed on the bulletin board of the workshop or be distributed to students.

Examples of practical lesson plans for three types of schools are shown as below. The example for Applied Technology School is the most flexible, thus it is an effective practical lesson plan for students' learning.



**Practical Lesson Plan (Applied Technology School) :**

The number of first-year machine maintenance students in one class is 32. There were constraining conditions as follows for the curriculum:

<b>Equipment:</b>	16 slide calipers, 1 drilling machine, 1 lathe machine, 1 gas welding machines, 1 arc welding machine, 8 files available at school.
<b>Number of teachers:</b>	4 in total. 1 could teach welding and 3 could teach other topics.
<b>Topic of the practical lesson</b>	Hand-finishing, drilling machine, and welding are covered in the first year.

Discussion took place with participation of **all** practical lesson teachers, and they agreed that the students should be divided into 4 groups of 8 each, and that the plan for practical lessons would be as follows:

	Group-1	Group-2	Group-3	Group-4
Week-1	Present the plan for practical lessons, announce the groups, and explain what competencies need to be acquired			
Week-2	Safety		Measurement	
Week-3	Measurement		Safety	
Week 4- 7	Hand-finishing	Arc Welding	Lathe	Gas Welding
Week 8- 11	Gas Welding	Hand-finishing	Arc Welding	Lathe
Week 12-15	Examination, etc.			
Week 16- 19	Lathe	Gas Welding	Hand-finishing	Arc Welding
Week 20- 23	Arc Welding	Lathe	Gas Welding	Hand-finishing
Week 24-	Examination, etc.			

The practical lesson for hand finishing and lathe involves measurements. Therefore, the lesson is designed to include the topic of measurements before implementing the topic of hand finishing and lathe. (Order of topics)

The “safety” class is held in the first week, but even if safety behavior for using machine tools (e.g., lathe) is explained at this time, the students would not be able to understand at all. Therefore, with the purpose of promoting general safety awareness, the content of the lesson includes: introduction of accident cases in the factory, explanation about the importance of the dress code, and walking around in the school with students to search together where potential risks are hidden. (Order of topics, Students’ basic academic level)

This plan was presented to the first year students in the first class of the academic year. The plan was also displayed on the wall of the workshop.



**Practical Lesson Plan (Conventional school) :**

Topics of the practical lesson to be instructed in each semester are decided in advance by MOETE at conventional schools. However, each school is allowed to adjust it within the range of discretion.

The number of first-year machine maintenance students in one class is 24. There were constraining conditions as follows for the curriculum:

<b>Equipment:</b>	16 slide calipers, 16 files, 2 gas welding machines, 2 arc welding machines available at school.
<b>Number of teachers:</b>	4 in total. 2 could teach welding and 2 could teach other topics.
<b>Topic of the practical lesson</b>	Hand-finishing and welding are covered in the first semester of the first year.

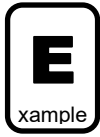
Discussion took place with participation of **all** practical lesson teachers, and they agreed that the students should be divided into 3 groups of 8 each, and that the annual plan for practical lessons would be as follows:

	<b>Group-1</b>	<b>Group-2</b>	<b>Group-3</b>
Week 1	Present the plan for practical lessons, announce the groups, explain what competencies need to be acquired, and instruct safety		
Week 2-4	Gas Welding	Measurement	Measurement
Week 5-7	Arc Welding	Gas Welding	Hand-finishing
Week 8-10	Measurement	Arc Welding	Gas Welding
Week 11- 13	Hand-finishing	Hand-finishing	Arc Welding
Week14-15	Examination		

The practical lesson for hand finishing involves measurements. Therefore, the lesson is designed to include the topic of measurements before implementing the topic of hand finishing. (Order of topics)

The “safety” class is held in the first week, but even if safety behavior for using machine tools (e.g., lathe) is explained at this time, the students would not be able to understand at all. Therefore, with the purpose of promoting general safety awareness, the content of the lesson includes: introduction of accident cases in the factory, explanation about the importance of the dress code, and walking around in the school with students to search together where potential risks are hidden. (Order of topics, Students’ basic academic level)

This plan was presented to the first year students in the first class of the academic year. The plan was also displayed on the wall of the workshop.



### Practical Lesson Plan (Dual School)

Topics of the practical lesson to be instructed each semester are decided in advance by MOETE at dual schools. But each school is allowed to adjust it within the range of discretion. In the case of dual schools, the period of practical lessons at the schools is only four weeks, which is limited. Even in this case, adjustments can be made as shown below:

	<b>Group-1</b>	<b>Group-2</b>	<b>Group-3</b>
Week 1	Present the plan for practical lessons, announce the groups, explain what competencies need to be acquired, and instruct safety		
	Gas Welding	Measurement	Measurement
Week 2	Arc Welding	Gas Welding	Hand-finishing
Week 3	Measurement	Arc Welding	Gas Welding
Week 4	Hand-finishing	Hand-finishing	Arc Welding

The practical lesson for hand finishing involves measurements. Therefore, the lesson is designed to include the topic of measurements before implementing the topic of hand finishing. (Order of topics)

The “safety” class is held in the first week, but even if safety behavior for using machine tools (e.g., lathe) is explained at this time, the students would not be able to understand at all. Therefore, with the purpose of promoting general safety awareness, the content of the lesson includes: introduction of accident cases in the factory, explanation about the importance of the dress code, and walking around in the school with students to search together where potential risks are hidden. (Order of instruction, Students’ basic academic level)

This plan was presented to the first year students in the first class of the academic year. The plan was also displayed on the wall of the workshop.



### Cost :

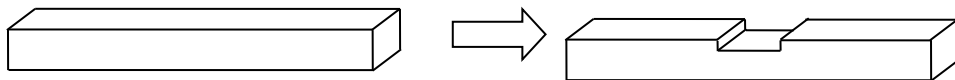
Material cost for the practical lesson : By introducing small groups, the time of actual work exposure for each student increases. Therefore, more material for the practical lessons is necessary.

**(2) Improvement of Lesson Plan : Break down the work into small processes to increase practice of the basic steps**

If all work from start to finish is to be done in one go, it would not be possible to repeat and practice the basic steps (check requirements–work–confirm results). Without confirmation, the wrong work method may become a habit. For this reason, especially for topics covered for the first time, break down the work into small processes and make a process short. Making a process short allows the teacher to have more opportunities to check whether the students are doing the work correctly and the students are correctly confirming (measuring) the results of their work.



**Example of breaking down into smaller processes :**



Example of an unsuitable instruction for a beginner:

Use a file to produce the work piece on the right from the material on the left.

Example of a suitable instruction for a beginner:

Follow the processes below to produce the work piece.

Process 1: Finish the end face.

Process 2: Create the groove on the surface.

Process 3: Finish the work piece.

It is possible to increase the numbers of times for repetitive practice of the basic steps (check requirements-work-confirm results) in each process by increasing the processes in this way.



**Tips for how to decide the length of processes**

Once the students become familiar with the work, smaller processes may start to feel too boring. When the students become skilled for the work, the processes should be longer.



**Example of Lesson plan**

The example of electronics and mechanical departments are contained in the attachment.


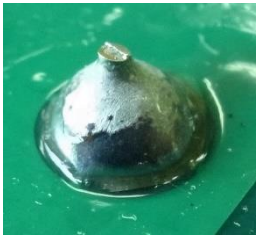



**(3) Develop a system so that students can easily and repeatedly confirm the results of their work**

In order to have the students repeatedly practice and confirm the results of their work, it should be set up to be easy to check the model case at any time during work.



Display handouts of the photos below on the workbench so that students can check to see what a “neat soldering” looks like any time.

		
<b>Example of a neat soldering</b>	<b>Bad example (excessive volume of soldering)</b>	<b>Bad example (excessive heat)</b>



**Display:**

Examples are as below:

- Display posters in places where students can easily check
- Laminate the handout and display (it can be used many times)
- Print and distribute handouts
- Distribute booklets (If the volume of content is large)



**Cost :**

Cost for posters, for laminating, for papers (the cost is different for each display method)

## 2.3 Instruction Method for Repetitive Practice

Until students have acquired knowledge and skills, it is necessary that teachers confirm repeatedly whether the students remember the knowledge and have acquired the skills. The teachers check how well the knowledge and skills have been acquired at every critical point. Check the status of acquisition, and tell the students that they have acquired the knowledge and skills correctly if they have. If not, give instructions on how to do it correctly. When giving instructions, it is effective to point to exemplary cases on prepared posters and have the students confirm by visual inspection, recitation, etc. Repeat this process. The following table shows the process.

Scene	Students' target behavior	How teachers should provide instructions
At the start	<p>[Check requirements] Students understand the following points.</p> <ul style="list-style-type: none"> <li>✓ Overall process and the process of the lesson</li> <li>✓ The objective of the work</li> <li>✓ Requirements (specification documents, circuit diagrams, etc.)</li> <li>✓ Basic theory</li> <li>✓ Names and Functions of the machinery/equipment and tools</li> </ul>	<p>[Check requirements] Teacher explains the contents of the requirements to the students.</p> <ul style="list-style-type: none"> <li>➤ Overall process and the process of the lesson</li> <li>➤ The objective of the work</li> <li>➤ Requirements (specification documents, circuit diagrams, etc.)</li> <li>➤ Basic theory</li> <li>➤ Names and Functions of the machinery/equipment and tools</li> </ul> <p>After explanation, the teacher checks if the students understand the requirements. If they do, tell them that they understand correctly. If not, give instructions repeatedly until they can understand.</p>

Scene	Students' target behavior	How teachers should provide instructions
During practical lessons	<p>[Work] Students perform the work to achieve the requirements.</p> <p>[Confirm results] Students frequently confirm if the results of the work they did satisfy the requirements. After confirming, if the requirements are not satisfied, the students reconfirm the requirements and perform the work.</p>	<p>[Work] Teacher walks around to see if students work correctly to satisfy the requirements. If students work correctly, the teacher tells the students that it is done correctly. If not, the teacher gives instructions repeatedly until they can do it.</p> <p>[Confirm results] Teacher walks around to see if the students confirm the results of the work correctly. If the confirmation of the result is done correctly, the teacher tells the students that they did it correctly. Repeat this until the results of the work satisfy the requirements. If not, the teacher explains to the students repeatedly until they can confirm the results correctly.</p>
At the end		<p>Teacher explains the summary of the practical lesson of the day. If there is an example of a serious mistake, the teacher communicates it to all the students and encourages them to think why the mistake happened.</p>



### **Tips for repetitive practice and repetitive instruction :**

Competencies can be acquired through simple repetitive practice. However, there are some things that can be added to help students learn more efficiently.

- 1) **Make sure the students have a sense of purpose:** In order to have the students acquire the knowledge and skills efficiently, the students need to have a sense of purpose. Therefore, the necessity of each competency should be communicated repeatedly at the start of the practical lesson.
- 2) **Have the students review their actions:** Having the students themselves be aware of and review whether they are taking correct actions also helps to turn the correct actions into a habit. During practical lessons, it is advisable to have individual students review their own actions and think together with all students at the end of the practical lesson by showing the examples of wrong behaviors found during lessons.
- 3) **Teacher becomes the role model for the students:** The teacher is a role model for the students. If the teacher does not practice correct actions, the students will follow it. If the students are not taking correct actions, it is as if the school is demonstrating that its teachers do not take correct actions. Teachers must always be conscious of the students watching them, think back on how they are conducting themselves, and make improvements.
- 4) **Teachers should have a shared understanding on instructions:** The students will be confused if teachers do not share the same understanding and give different instructions. It is necessary for the teachers to hold regular school staff meetings and department meetings, to ensure that they share a common understanding on the instructions.



### **Cost**

No additional cost is necessary (While it may incur costs during preparation, repetitive instruction itself does not.)



**Advance**

### **Advanced level of repetitive instruction :**

The competency will be forgotten if it is not used. In particular, after long school breaks, it is highly possible that the students have forgotten competencies acquired. It may be a good idea to break down larger chunks of processes into smaller processes again after an extended school break to check how much the students remember at each process before moving forward.

## Chapter 3. Implementing Repetitive Practice for SB2: Safe Behavior

### 3.1 Description of Competency

Description: Independently perform safe behavior to ensure safety at corporate manufacturing sites.

Detail:

In order to maintain safety at the production site of a company, it is necessary to understand and practice safety standards. There are various risks at the company's production site. Workers must ensure safety not only for themselves but also for other workers by recognizing risks and taking action according to the safety standards. Safety also greatly affects the efficiency of the company's production activities. Teachers should inform this to make sure that the students understand and appreciate the importance of safe behavior and practice it.

Securing safety in workshops at each department involves the following three elements: dress code, safe behavior, and work environment.

<b>Dress code</b>	The risk of accidents can be decreased by properly wearing clothes and protective equipment suitable for the work. Compliance with the dress code is fundamental for working safely.
<b>Safe behavior</b>	The risk of accidents can be decreased by complying with the basic safe behavior standards (work procedures) for carrying out the work, and the ones that are focused on a particular work. This involves actions to be taken for safety, what not to do, and how to deal with accidents when they happen.
<b>Work environment</b>	The work environment such as work space, aisles, and arrangement of objects greatly affects the safety of workers. Therefore, it is necessary to design a safety-conscious work environment. In addition, Sort, Set in order, and Shine in the work environment is essential for maintenance of the safe work environment. (Sort, Set in order, and Shine; to be discussed in Chapter 4)

Usually, safety topics described in textbooks are taught at the beginning of practical lessons. This guideline presents instruction methods for repetitive practice to make safe behavior a habit apart from that safety lesson.

## 3.2 Preparation for Instructions

### (1) Create and display a basic dress code

Create and display a basic dress code that students must conform to during practical lessons. Basically, there can be no exceptions. Creating a standard that is not possible to follow results in the standard being ignored, causing a false impression among the students that standards do not need to be followed. For this reason, the standard must be achievable while making sure that safety comes first.



#### **Tips for creating the dress code:**

**Cost:** It is recommended that the school purchases the work clothes, caps, shoes and protective gears and distribute them to the students, but if this is not possible, create a dress code that can be followed with the clothes that the students already have or that can be readily purchased.

**Religion:** A hijab or niqab may get caught in machines. Consider a way to ensure safety during work while also respecting the students' religion and culture.



#### **Display:**

To have the students practice repeatedly, it is effective to display model examples that the students can refer to quickly. For quick reference, the following points should be noted.

- Display it in a visible place in the workshop.
- Use larger text and easy-to-see colors
- Explain clearly and specifically by using diagrams, pictures, and photos



#### **Cost:**

Papers (for creating posters)



### Examples of a poster for standard dress code :



### Create work-specific dress codes

The basic dress code may not be sufficient for some machinery/equipment. For example, working with a welding machine requires protective gear (goggles to protect the eyes, flame retardant aprons and sleeves). It's preferable to create specific dress codes for specific equipment as needed.



## (2) Create and display basic standards for safe behavior

In order to avoid accidents during practical lessons, teachers should create and display basic standards for safe behavior that students must follow.



### Examples of safe behavior standards :

- a) Students must always practice physical self-care; report to the teacher if not feeling well.
- b) Always put safety first and work safely
- c) Before starting use of machinery/equipment, check whether it is safe for use
- d) Do not start work before the teacher gives the instruction
- e) Ask permission from the teacher when stepping away from the work
- f) Do sorting work within a designated area
- g) If any issues are found with the items used during practical lessons (machinery/equipment, machine tools, parts), report to the teacher
- h) In case of an accident, immediately report to the teacher



### Display:

It's effective to display the standards so that students can refer to it immediately while doing repetitive practice over and over. Take note of the following points:

- Display it in a visible place in the workshop.
- Use larger text and easy-to-see colors
- Explain clearly and specifically by using diagrams, pictures, and photos



### Cost:

Papers (for creating posters)



**Advance**

### Create work-specific standards for safe behavior:

The basic standards for safe behavior may not be sufficient for some machinery/equipment. It's preferable to create specific standards for safe behavior for specific equipment as needed.



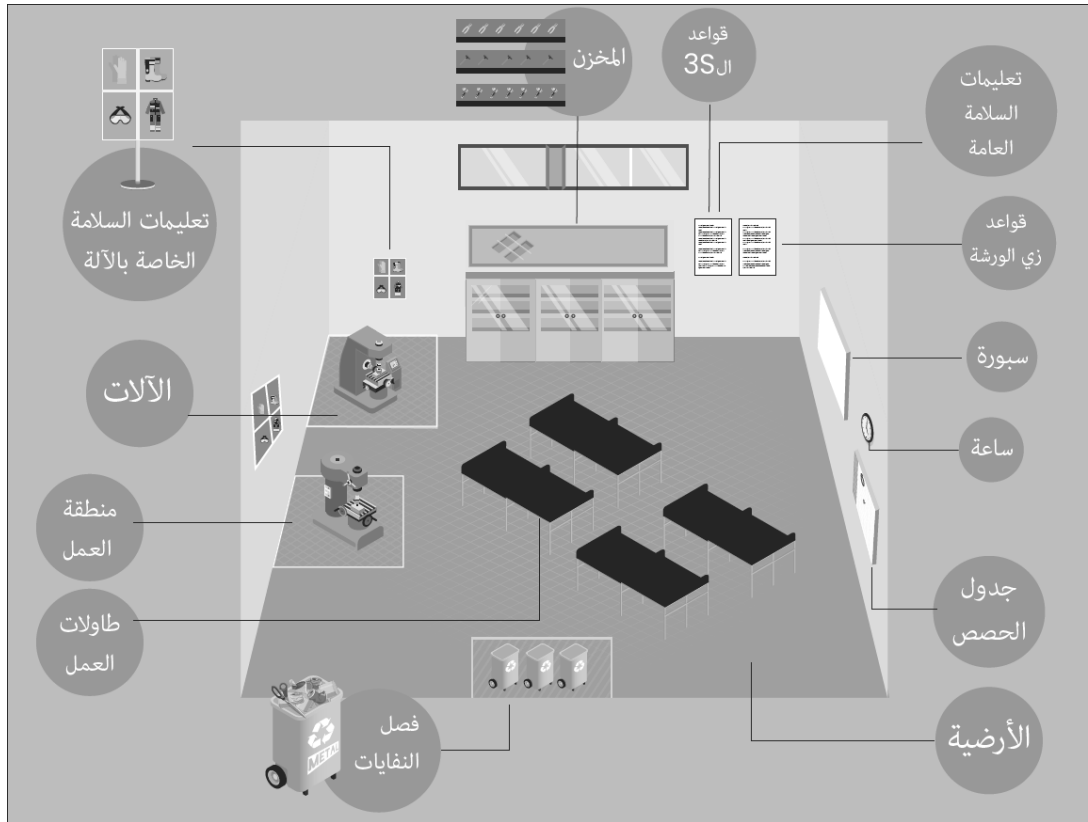
### (3) Create a standard work environment

Design the work space, aisles, and arrangement objects in consideration of safety.



#### Examples of work environment design:

- Mark the work area with lines or stickers to make it easier to recognize where it is.
- Keep enough space for the equipment to prevent contact with the students during work.
- Install objects in places that do not interfere with work (shelves, rubbish bins, etc.)



<p>- منطقة العمل موضحة بعلامات بخطوط أو علامات. - توجد مسافة كافية بين الآلات. - العناصر موضوعة في أماكن لا تتداخل مع منطقة العمل. - لا يوجد عوائق في الممرات.</p>	<p><b>منطقة العمل</b></p>
<p>- تم تعليق ملصقات معايير زي الورشة - تم تعليق ملصقات السلامة العامة.</p>	<p><b>ملصقات الأمن والسلامة العامة</b></p>
<p>- تم تعليق ملصقات السلامة الخاصة بعمل معين بجانب الآلة.</p>	<p><b>ملصقات الأمن والسلامة الخاصة بعمل معين</b></p>



**Cost:**

Rubbish bins, colored tape etc.

### 3.3 Instruction Methods for Repetitive Practice

No matter how much you know about safety, it is meaningless unless you can actually work safely. Teachers should always check whether the students are practicing safe behavior. If they do not practice safe behavior, correct it immediately, and they will be able to acquire the habit of safety behavior. When giving instructions, it is effective to encourage the students to keep safety standards in mind by pointing to the prepared posters of the standards.

Repeat practice is to be conducted over and over in each practical lesson, at the start, during, and at the end of the practical lesson as follows.

Scene	Students' target behavior	How teachers should provide instructions
At the start	<ul style="list-style-type: none"> <li>✓ Follow the dress code when attending class.</li> <li>✓ Check standards for safe behavior</li> <li>✓ Understand the key points of the lesson's work with regard to safety.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Check what the students are wearing. If there are any students who do not follow the dress code, have them correct it on the spot.</li> <li>✓ Have the students confirm the safety standards (e.g., have the students look at and recite the safety standards displayed on posters).</li> <li>✓ Explain the key points of the lesson's work with regard to safety. In particular, when using new machinery/equipment or tools, the teacher demonstrates how to use them safely. Explain specifically how to work safely and what not to do.</li> <li>✓ Important points should be read out loud together to raise awareness on safety.</li> </ul>
During practical lessons	<ul style="list-style-type: none"> <li>✓ Conduct oneself in a way that conforms to the standard safe behavior guideline</li> </ul>	<ul style="list-style-type: none"> <li>✓ Walk around to check that no one is doing work in an unsafe manner. If a student is found to be doing work in an unsafe manner, communicate this to the student and show how it is done correctly.</li> </ul>
At the end	<ul style="list-style-type: none"> <li>✓ Review the lesson's work of the day with guidance from the teacher</li> </ul>	<ul style="list-style-type: none"> <li>✓ Share unsafe behavior found during the lesson and ask all students to think why the behavior is unsafe. Provide the model answer to this question and the reason.</li> </ul>



### **Tips for repetitive practice and repetitive instruction**

Competencies can be acquired through simple repetitive practice. However, there are some things that can be added to help students learn more efficiently.

- 1) **Make sure the students have a sense of purpose:** In order to have the students acquire the knowledge and skills efficiently, the students need to have a sense of purpose. Therefore, the necessity of each competency should be communicated repeatedly at the start of the practical lesson.
- 2) **Have the students review their actions:** Having the students themselves be aware of and review whether they are taking correct actions also helps to turn the correct actions into a habit. During practical lessons, it is advisable to have individual students review their own actions and think together with all students at the end of the practical lesson by showing the examples of wrong behaviors found during lessons.
- 3) **Teacher becomes the role model for the students:** The teacher is a role model for the students. If the teacher does not practice correct safe behaviors, the students will follow it. If the students are not taking correct actions, it is as if the school is demonstrating that its teachers do not take correct actions. Teachers must always be conscious of the students watching them, think back on how they are conducting themselves, and make improvements.
- 4) **Teachers should have a shared understanding on instructions:** The students will be confused if teachers do not share the same understanding and give different instructions. It is necessary for the teachers to hold regular school staff meetings and department meetings, to ensure that they share a common understanding on the instructions.



#### **Cost:**

No additional cost is necessary (While it may incur costs during preparation, repetitive instruction itself does not.)



**Advance**

#### **Advanced level of repetitive instruction :**

Competency will be forgotten if not used. In particular, after long school breaks, it is highly possible that the students have forgotten the knowledge and skills learned. Even for the safety-related topics that have been covered before, it's better to re-check how much the students remember after an extended school break.



**Advance**

**Foster independence in the students :**

When the students become accustomed to this competency, have the students check the dress code and safety standards themselves. This inspires a sense of responsibility and will further encourage independent action. This should start with students in the second year or higher grade as students have already gained the general knowledge.

## Chapter 4. Implementing Repetitive Practice for 3S: Sort/Set in order/Shine

### 4.1 Description of Competency

Description: Independently perform sort/set in order/shine at the workshop to increase product quality and to enable work efficiency.

Detail:

An efficient work environment can be maintained by the practice of Sort/Set in order/Shine. Sort/Set in order/Shine comes from 5S in Japanese factories. 5S represents the first letter of five key words: Sort, Set in order, Shine, Standardize and Sustain. 5S is a slogan mainly used for maintaining and improving on-site such as manufacturing industry, service industry, etc, since it is considered to be effective for increasing time and space efficiency. For this reason, having experienced 5S will be an advantage for technical secondary school students who are set to work in the industry after graduation. 5S not only concerns efficiency, but is also closely related to safety and quality. Teachers should inform this to make sure that the students understand and appreciate the importance of sort/set in order/shine and practice it.

#### Description of 5S

<b>Sort</b>	<b>Remove unnecessary items:</b> Only keep items necessary for work and put away or discard all unnecessary items. By doing so, necessary items can be retrieved immediately, which increases the work efficiency.
<b>Set in Order</b>	<b>Set items in order so that they are easy to use with labelling:</b> Decide where materials and tools should be stored and make sure that they are always placed there. This reduces the time looking for items, which increases work efficiency.
<b>Shine</b>	<b>Clean and inspect:</b> Clean the workshop and machines. This makes it possible to notice any issues, such as oil leak from the machines, thus increasing production efficiency and safety.
<b>Standardize</b>	<b>Maintain (standardize) the practice of Sort/Set in order/Shine:</b> Make sure that the above three activities (3S) are practiced. Develop standardized rules to keep the workshop and machines always neat and clean. Display the standardized rules so that everyone can see them.
<b>Sustain</b>	<b>Train to form habits:</b> Continue training the workers on the standardized rules so that the practice of Sort, Set in order, Shine is maintained.




Sort, Set in order and Shine are daily activities, and often called 3S. In companies, the all employees are expected to contribute to Standardize and Sustain; however, this is not the same for schools. In schools, the teachers develop the framework (Standardize) and train the students (Sustain), and the students practice 3S. This means that the teachers must master all 5S. The practical lesson textbook does not mention Sort/Set in order/Shine. For this reason, rules must be developed by the teachers and it's necessary to have students perform repetitive practice.

## 4.2 Preparations for instructions:

### (1) Teachers themselves practice Sort/ Set in order/ Shine in the workshop (Sort/Set in order/Shine)

Teachers themselves practice Sort/Set in order/Shine in the workshop and do necessary preparations to have students perform repetitive practice for Sort/Set in order/Shine. The following shows how this is generally done. Revise as necessary to suit the situation of the workshop.



- Sort:
    - Tools/Materials etc
      - All teachers for practical lessons agree on the type of labels to mark unnecessary items. The labels should be inexpensive, such as colored tape. Once labeling is finished, dispose of these items.
- 
- Set in Order:
    - Tools/Materials etc
      - Sort by type of item and decide where to store each
      - Label the storage space as decided, and place the items. (Development of rules)
    - Sorting waste
      - Decide how waste is to be sorted.
      - Install rubbish bins based on the sorting method defined.
      - Label the rubbish bins to show what type of waste can be put in them.
- 
- Shine:
    - Floor
      - Sweep the floors. If necessary for sanitary purposes, also wipe the floors.
    - Workbench
      - Wipe the workbenches.
    - Equipment and tools
      - Clean each equipment thoroughly. Fix any issues found, such as oil leaks. Make sure they are in a condition ready to use any time.
- 



## (2) Create and display rules of Sort/ Set in order/ Shine (Standardize)

Create and display rules of Sort/Set in order/Shine that students must follow.

### Rules that should be created:



Generally, it should include the following, but can be revised as necessary to suit the situation of the workshop

- A general rule stating that the workbench must be kept organized and tidy
- Rules for sorting waste
- Rules for cleaning
- How to clean the machinery/equipment (Only for machines cleaned by students)



### Display:

It's effective to display the rules so that students can refer to it immediately while doing repetitive practice over and over. Take note of the following points:

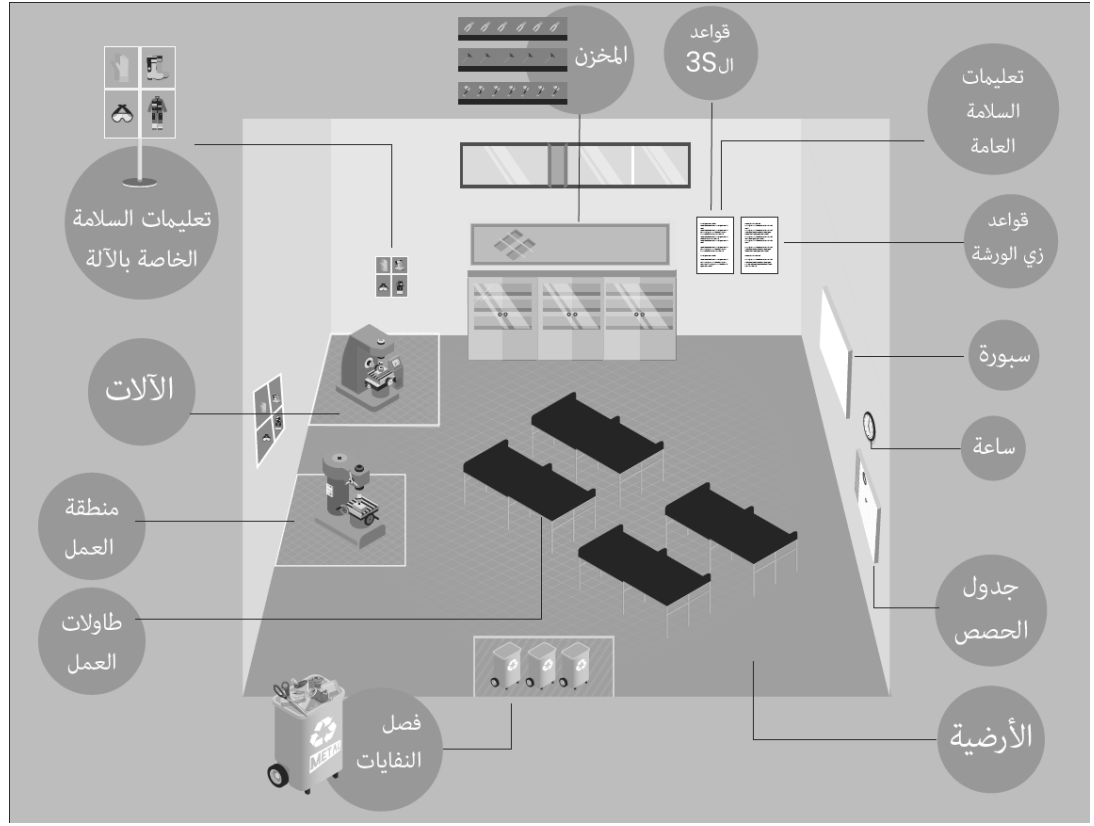
- Display it in a visible place in the workshop.
- Use larger text and easy-to-see colors
- Explain clearly and specifically by using diagrams, pictures, and photos



### Cost:

- Papers (for creating posters)
- Storage space, rubbish bins (It's possible to creatively utilize existing things)

## Examples of 5S in the workshop:



<ul style="list-style-type: none"> <li>- لا توجد عناصر غير ضرورية.</li> <li>- الأدوات نظيفة.</li> <li>- الأدوات والخامات مرتبة حسب العنصر.</li> <li>- تم لصق بطاقات توضح محتويات الأدراج.</li> </ul>		المخزن
<ul style="list-style-type: none"> <li>- تم تحديد قواعد تصنيف النفايات.</li> <li>- صناديق النفايات موضوعة وفقاً لقواعد التصنيف.</li> <li>- تم لصق بطاقات توضح نوع المهملات داخل الصندوق.</li> </ul>		فصل النفايات
<ul style="list-style-type: none"> <li>- تم كنس ومسح الأرضية.</li> </ul>		الأرضية
<ul style="list-style-type: none"> <li>- تم تنظيف طاولات العمل.</li> </ul>		طاولة العمل
<ul style="list-style-type: none"> <li>- تم تعليق قواعد ال3S</li> </ul>		قواعد ال3S
<ul style="list-style-type: none"> <li>- تم تنظيف الآلات وصيانتها وتجهيزها للعمل.</li> </ul>		الآلات



**Yearly Improvement:**

Teachers discuss and check whether there are any inconveniences regarding sorting waste or storage/management of machinery/equipment, or whether there are any difficulties with the instructions, and make improvements as necessary.

### (3) Hold initial student trainings (Sustain)

Students often have not been taught about Sort/Set in order/Shine. In addition, there is also no mention of it in the practical lesson textbook. Therefore, the necessity of Sort/Set in order/Shine and its rules must be explained to the students before implementing it in the practical lessons. (Initial Trainings).



#### Using tools for learning Sort/Set in order/Shine

Since the textbook does not have any description of Sort/Set in order/Shine, it may be effective to use similar diagrams and photos shown below to make the students think to promote their understanding.

The following diagram shows three workshops: A, B and C. Answer which workshop is most easy to work in, together with what made you think so.

**A. Original state**

**B. After sort**

**C. After set in order**

Label:

Unnecessary items are discarded

Discard

Items are set in order in a convenient way,

Example for the answer: Items are all over the place in A, and because unnecessary items are also scattered about, it takes time to find the necessary items. B is easier to work in, because the unnecessary items are removed. C has the items placed in order by the item name. It is obvious that C is the easiest to work in. By “sorting” A, it becomes like B, and further “setting in order” makes the place become like C. This is how “Sort” and “Set in Order” works.

### 4.3 Instruction methods for repetitive practice:

In order to make Sort/Set in order/Shine into a habit, continuous training is necessary. After showing the whole picture once in the initial training, repeat practice for making a habit of Sort/Set in order/Shine is conducted in the practical lessons. Teachers should always check if the students are practicing Sort/Set in order/Shine. If they do not practice Sort/Set in order/Shine, give instructions immediately, and they will be able to acquire the habit of Sort/Set in order/Shine. When giving instructions, it is effective to encourage the students to always keep Sort/Set in order/Shine in mind by pointing at rules on the prepared posters.

Repeat practice should be conducted over and over in each practical lesson: at the start, during, and at the end of the practical lesson as follows.

Scene	Students' target behavior	How teachers should provide instructions
At the start	✓ Collect the necessary tools/materials.	✓ Teacher indicates to the students what tools and materials are necessary for the work in the lesson, and asks the students to collect them.
During practical lessons	<ul style="list-style-type: none"> <li>✓ Keep the workbench organized and tidy.</li> <li>✓ Be the first to pick up any waste on the floor and discard it according to the rules.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Walk around to check to see that the workbench is always kept organized and tidy.</li> <li>✓ Instruct the students to be the first to pick up any waste on the floor and discard it according to the rules</li> </ul>

At the end	<ul style="list-style-type: none"> <li>✓ Clean the equipment and tools used.</li> <li>✓ Return the tools/materials used to their original places.</li> <li>✓ Clean the workshop according to the rules for cleaning</li> <li>✓ If there is any waste to discard after work, discard it according to the rules.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Instruct students to clean equipment and tools used. Demonstrate the proper way of cleaning.</li> <li>✓ Instruct the students to return the tools/materials used in the lesson to their original places.</li> <li>✓ Supervise students' way of cleaning.</li> </ul>
After the practical lesson		<ul style="list-style-type: none"> <li>✓ Check to see that the tools/materials used in the lesson are returned to their original places, and that the tools are not broken (Check tool). If any issues are found, identify the student who was using the tool, ask them what happened and give strict instructions.</li> </ul>



### **Tips for Repetitive Practice and Repetitive Instruction:**

Competencies can be acquired through simple repetitive practice. However, there are some things that can be added to help students learn more efficiently.

- 1) **Make sure the student has a sense of purpose:** In order to have the students acquire the knowledge and skills efficiently, the students need to have a sense of purpose. Therefore, the necessity of each competency should be communicated repeatedly at the start of the practical lesson. For 3S, the instructions are emphasized through the whole practical lesson.
- 2) **Have the students review their actions:** Having the students themselves be aware of and review whether they are taking correct actions also helps to turn the correct actions into a habit. During practical lessons, it is advisable to have individual students review their own actions and think together with all students at the end of the practical lesson by showing the examples of wrong behaviors found during lessons.
- 3) **Teacher becomes the role model for the students:** The teacher is a role model for the students. If the teacher does not practice sort/set in order/shine, the students will follow it. If the students are not taking correct actions, it is as if the school is demonstrating that its teachers do not take correct actions. Teachers must always be conscious of the students watching them, think back on how they are conducting themselves, and make improvements.
- 4) **Teachers should have a shared understanding on instructions:** The students will be confused if teachers do not share the same understanding and give different instructions. It is necessary for the teachers to hold regular school staff meetings and department meetings, to ensure that they share a common understanding on the instructions.



### **Cost:**

No additional cost is necessary (While it may incur costs during preparation, repetitive instruction itself does not.)



**Advance**

### **Advanced Level of Repetitive Instructions:**

Competency will be forgotten if not used. In particular, after long school breaks, it is highly possible that the students have forgotten the knowledge and skills learned or lose the attitude of practice. It's better to re-check how much the students remember 3S after an extended school break.



**Advance**

**Check tool**

In order to check Sort/Set in order/Shine after the practical lesson, the following check sheet is prepared, and the teacher conducts a check before the end of the practical lesson. As a result of the check, if there are any inadequacies, the teacher gives the students instructions for improvement before the end of the practical lesson.

Date	Checked by	Class	No waste on the floor	Waste discarded based on rules	Tools/equipment used are cleaned	Tools, equipment, parts used are returned to their original places	Workbenches and chairs are neatly organized and cleaned by duster
MM/DD	X	1-1	✓	✓	✓	✓	✓
MM/DD	Y	1-2	✓	✓	✓	✓	✓



**Advance**

**Forster independence in the students**

When the students become accustomed to Sort/Set in order/Shine, move on to activities that encourage the students to act independently, such as deciding on a workflow to have the students check and keep records themselves with reference to the above check sheet displayed on the wall of the workshop, and have them report to the teacher when they finish. Such transition to independent action is recommended for students in the second year or higher. Before transitioning, make sure to confirm that the students have mastered the knowledge on 3S.



## **Chapter 5. Implementing Repetitive Practice for TM: Time management**

### **5.1 Description of Competency**

Description: Independently perform time management expected at companies.

Detail:

“TM: Time Management” is extremely important on site, such as in factories where there are a large number of workers. When everyone starts working after a break, a single person missing could mean that there is a hole in the process, which lowers the work efficiency. Not only is the work delayed, but this may also lead to a significant damage or accident, which is another reason why technical secondary schools need to educate their students to perform “TM: Time Management” independently. Teachers should explain the importance of “TM: Time Management”, and make sure the students understand, appreciate, and practice “TM: Time Management”.

“TM: Time Management” is a competency that requires multiple abilities, including: discipline, a sense of purpose, goal consciousness, planning, prioritizing, and the ability to act. For example, coming to practical lessons on time seems very easy. However, in order to act like this, the student would first need the ability to plan, to estimate the exact time to leave the classroom to go to the practical lesson taking into consideration the time to change to work clothes and go to the workshop. The student would also need discipline, to decline invitations that conflicts with time management. In this way, acquiring the competency of “TM: Time Management” is something that leads to the development of multiple abilities simultaneously. This guideline focuses on reducing tardiness as a means to acquire this competency.

“TM: Time Management” is tackled through concerted efforts that involve the whole school. As such, it requires the understanding and cooperation of all teachers. The principal decides on the preparation of standards and system for giving instructions on time management according to the situation of the school. Then, all the teachers should cooperatively prepare for and provide instructions to the students. In addition, since this is significantly related to the students’ lifestyle, the cooperation of the parents/guardians should be sought as necessary.

## 5.2 Preparation for Instructions

### (1) Create the standard of preparation time to the next class and communicate to students

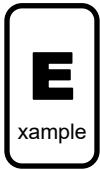
The current timetables at technical secondary schools do not have breaks between classes. This means that it is impossible for the students to be on time if they need to go to another classroom for the next lesson. This is same with the teachers. Since there is no time to move between the classes, it is impossible to start lessons on time. In this environment, it is difficult to make time management into a habit. Therefore, in order to acquire the habit of time management, the school create a standard for the preparation time for the next class (including moving to the next classroom). In this guideline, it is recommended to choose between the following two options.

- A 5-minute break is introduced between each class: If it is not possible to change the time school ends, each class is cut 5 minutes shorter and assign the time for the break. If a class extends over multiple class periods, the teacher should decide when to have the break, based on the progress of the lesson.
- The teacher finishes the lesson 5 minutes before the end of the class: These 5 minutes from the end of the class to the start of the next class are not called the “break” but “preparation time.”



#### **Display the one-week timetable**

For time management, it is essential to be conscious of the next schedule, calculate the time back, and take action. In order for the students to acquire this habit, one-week timetables are to be created in line with the “standard for the preparation time for the next class” and to be displayed on the walls of all classrooms and workshops. The timetables should preferably be created for each class, specifying the lesson time for each class period, subjects, breaks between classes, etc. The timetables should be posted at visible places, in an easy-to-see size for the students. Attention should also be given to where the timetables are displayed, such as the front wall of each classroom or near the doors so that the students can regularly check them.



**An example of a weekly timetable format:**

Period	Time	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
Morning line							
1							
break							
2							
break							
3							
break							
4							
break							
5							
break							
6							
break							
7							
break							
8							
break							
9							



**Tips for instructions**

It increases effectiveness to print and distribute the timetable to the students, or have the students copy the timetable in their notebooks and carry it with them.



**Cost**

Papers (for making timetables)

**(2) Introduce system that allows the teachers and the students to know the time to start the next class**

In order to make time management into a habit, it is also necessary to introduce system that allows all the students and the teachers to know the start time of the next class. In this guideline, it is recommended to introduce both of the following two plans, but the introduction may be tailored to the current situation of each school.

Plan 1: Install wall clocks in each classroom (including workshops)

Plan 2: Install a system to signal with a bell, etc. at the start and end of each class



**Tips for the system :**

If the timing of the clock or bell is not accurate, the students might subconsciously think that “the clock or bell is not reliable.” If there is a clock or bell that has stopped due to battery exhaustion or that does not indicate the correct time, it is important to set the clock or bell to the right time by replacing the battery immediately, etc. Making a realistic management plan is also important.



**An example of a management tool :**

Date التاريخ	Day اليوم	Clock status حالة الساعة وحدة التحكم	Bell status حالة الجرس يعمل / لا يعمل	Responsible person الشخص المسئول	Description of the problem وصف المشكلة
1-Feb-18	الخميس	<input type="checkbox"/>	<input type="checkbox"/>		
2-Feb-18	الجمعة	<input type="checkbox"/>	<input type="checkbox"/>		
3-Feb-18	السبت	<input type="checkbox"/>	<input type="checkbox"/>		
4-Feb-18	الأحد	<input type="checkbox"/>	<input type="checkbox"/>		
5-Feb-18	الاثنين	<input type="checkbox"/>	<input type="checkbox"/>		

Fill out X in the “clock status” and “bell status” when you find any problem

Fill out √ in the clock status and bell status when the clock works well



**Cost**

Wall clocks, bells etc.

**(3) Communicate to the students what responses are to be provided if they fail to follow the standard for time management behavior (tardiness)**

Communicate to the students the responses (rules) that are to be provided from the school and MOETE to the students if they fail to follow the standard.

### 5.3 Instruction Method for Repetitive Practice

Instruction on time management should be provided not only during practical lesson but also by everyday repetitive practice throughout the school life. Not only specific teachers but all the teachers, at the initiative of the teacher in charge as shown in the table below, should give the students awareness on “keeping time” and have them acquire the habit of time management behavior.

Scene	Students’ target behavior	How teachers should provide instructions	Teacher in charge
Morning line	✓ Students are lined up at a designated place	<ul style="list-style-type: none"> <li>✓ Instruct the students to line up at a designated place by the start of the morning line.</li> <li>✓ Provide response to the tardy students according to the standard and ask the reason for being late. If the tardiness is ascribed to the students personally, advise them not to be late again and present them improvement measures as necessary.</li> </ul>	Supervisor of the day
Preparation time for the next class	✓ Students prepare for the next class, using the preparation time	<ul style="list-style-type: none"> <li>✓ Make the rounds of the school to see if the students are preparing for the next class.</li> <li>✓ Give the students instructions to move to the designated place, such as the classroom or workshop for the next lesson, during the preparation time.</li> </ul>	Supervisor of the day
During class (all classes)	✓ Students are seated at the start of the lesson (wearing work clothes for the practical lesson)	<ul style="list-style-type: none"> <li>✓ Provide response to the tardy student according to the standard, and ask the reason for being late. Give instructions as necessary.</li> </ul>	Teacher in charge of the class
		<ul style="list-style-type: none"> <li>✓ Make the rounds of the school, and if any student is found staying outside the classroom or workshop, give the student instruction to go to the classroom or workshop.</li> </ul>	Supervisor of the day
Personal guidance to the student that is often late		<ul style="list-style-type: none"> <li>✓ According to the standard of the school and MOETE, provide personal guidance to the student that is often late and communicate with the parent/guardian of the student. Think together with the student about measures including reviewing lifestyle and give instructions.</li> </ul>	Social Specialist



### **Tips for Repetitive Practice and Repetitive Instructions:**

Competencies can be acquired through simple repetitive practice. However, there are some things that can be added to help students learn more efficiently.

- 1) **Have the students review their lifestyle:** Instead of simply emphasizing punctuality, the instruction should involve an understanding of the overall environment that is needed for enabling punctuality (e.g.: preparation on the previous day, having a grasp of how long it takes to school, situation at the previous class, etc.).
- 2) **Make sure the student has a sense of purpose:** In order to have the students acquire the knowledge and skills efficiently, the students need to have a sense of purpose. There are opportunities to emphasize importance of time management throughout the students' time at school.
- 3) **Have students review their own behavior:** Teachers give students time to think about why time management is necessary. Present various examples to show why time management is important. Companies value time management because it helps to produce products that satisfy customer requirements. One example is how companies strictly forbid being late in the morning because they communicate and share important information in the morning meetings for quality improvement. In some companies, people who are often late may have their salaries reduced or may even lose their jobs. Teachers give opportunities to students to look back on their own behavior by introducing such cases and communicating the importance of punctuality.
- 4) **Teacher becomes the role model for the students:** The teacher is a role model for the students. If the teacher does not practice time management, the students will follow it. If the students are not taking correct actions, it is as if the school is demonstrating that its teachers do not take correct actions. Teachers must always be conscious of the students watching them, think back on how they are conducting themselves, and make improvements.
- 5) **Teachers should have a shared understanding on instructions:** The students will be confused if teachers do not share the same understanding and give different instructions. It is necessary for the teachers to hold regular school staff meetings and department meetings, to ensure that they share a common understanding on the instructions.



### Cost

No additional cost is necessary (While it may incur costs during preparation, repetitive instruction itself does not.)



### Have the students think:

The practical lesson teacher A took the first five minutes at the start of the practical lesson to have the students think about the necessity of time management.

Teacher A: Today, let's consider why time management behavior is necessary. What problems do you think will occur if you are late for the practical lesson?

Student A: I will miss the teacher's explanation about the work and safety precaution.

Student B: I will not be able to proceed with my work without explanation about the work. Also, as I don't know the right way to do the work, I will not be able to make the work as requested.

Student C: Since I did not hear about the safety precautions, I might cause an accident during work. If I cause an accident, I might injure not only myself but also other students.

Teacher A: That's right. If you miss important matters or messages because you are late, you will not be able to do your work properly and safely. You need to understand the necessity of time management and learn time management in school life.



### Consider plans for improvement together with the students

For students who are often late to class, it is not enough to tell them that they shouldn't be late. Ask them about their daily and sleeping habits or their situation at home before coming to school, and instruct them to review their lifestyle and give guidance on managing their daily lives. It is recommended that plans for improvement are considered together with the students (e.g. making a student have a watch) . If there is a student with a particularly high number of tardies, it may be a good idea to have a separate discussion with the student, asking the parent/guardians to join.





### Check tool

**Advance**

It is possible to grasp the status of each student and class by recording attendance/tardiness/absence and compiling the record. Making designated symbols for attendance, late coming and absence described below make recording and compiling data easier.

Date		12/1	12/8	12/15	12/22	12/29	Monthly total	
							Absence	Late coming
1	A	✓	✓	✓	✓	✓	0	0
2	B	✓	✗	✗	✗	✓	2	1
9	I	✗	✓	✓	✗	✓	1	1
10	J	✓	✓	✓	✓	✓	0	0
Class monthly total							11	6

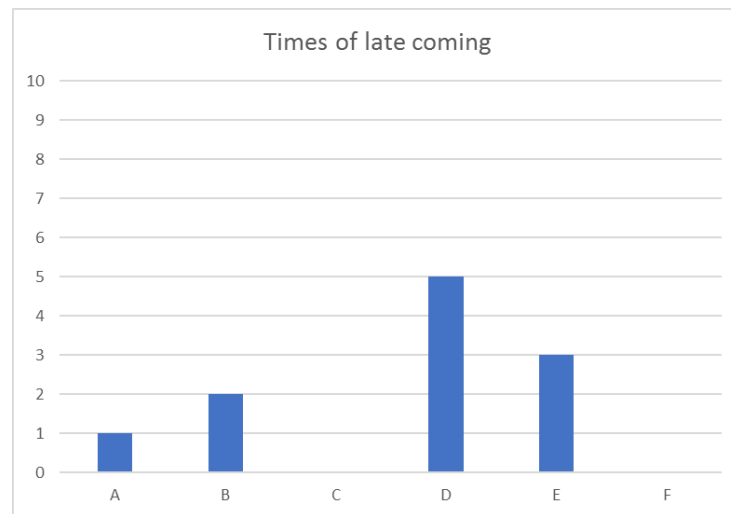
✓: Attend the class on time, / : Come to class late , ✗: Absent



### **Visualization, encouragement and group competition**

#### **Advance**

It is also a good idea to visualize the daily tardy records using charts, so that the students can see their status in a glance. The chart below is an example of visualizing the numbers of late coming. The horizontal axis shows classes and the vertical axis shows the numbers of students late for class. For one semester (or even a month), keep a record of the tardy students for each class. The classes could compete with one another, or it may also be good to commend the students who are never late.



### **Yearly Improvements**

#### **Advance**

At the end of the academic year, a school-wide meeting is held to discuss the issues and achievements regarding the instructions on time management during the past year, and if necessary, improvements are made on the instruction methods for time management.

## **Chapter 6. Partnering with Companies for Acquiring the Competencies Required by Companies**

For the students to acquire the competencies expected by companies, teachers must make sure that the students' knowledge and skills are firmly established by giving instructions to students repeatedly at practical lessons. To have students practice competencies repeatedly with their motivation, the teachers must be familiar with the needs of the companies, for example by making company visits, and communicate these needs to the students in a way that they can understand. This chapter discusses how to understand such needs through activities in partnership with the companies.

### **6.1 The Goals for partnering with companies**

There are two goals for partnering with companies:

- 1) To enable the teachers to understand the needs of the companies
- 2) To enable the teachers to understand the hiring requirements and work conditions at the companies

Having an understanding allows the teachers to provide guidance to the students on the needs of the companies and finding employment. Providing the students with information such as a) hiring requirements, b) working conditions, and c) career path after being hired in companies can increase the students' motivation for learning at technical secondary schools. It will also reduce the mismatch in career choice, which can be expected to lower the rate of graduates leaving their jobs.

### **6.2 How to Find Companies to Partner with**

The easiest way to find companies to partner with is through the network of graduates<sup>1</sup>. It is recommended that schools collect the information of place of works of graduates and find the companies to partner with through the contacts of graduates who started working at companies.

There are mainly three ways for collecting the information on their places of work. Each school should consider the way to collect companies to partner with from graduates.

- 1) Collect by calling to graduates after a certain period of time after their graduation
- 2) Request students before their graduation to notify to the school if they get a job; and
- 3) Hold job fairs and invite graduates to schools, and collect the information after their graduation

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<sup>1</sup> It is possible for dual schools to request Regional Units to find companies.

This guideline introduces the way to utilize existing MOETE system (31 new students database which is developed by each school every year<sup>2</sup>). Converting to electronic data of career path information is not always necessary. However, it is possible to develop the database of career path efficiently if the school utilizes the existing databases.



Timing	Method
After admission	<ul style="list-style-type: none"> <li>• When the school collects the information for 31 students database, check desired career of students. Categorize desired careers into 1) Study, 2) Study and work, 3) Work, and 4) others.</li> <li>• Add the column of “Desired career” on 31 students database and input the information.</li> </ul>
School years	<ul style="list-style-type: none"> <li>• Teachers give suitable career advice to students by grasping desired career of each student.</li> <li>• The students’ desired careers might change over three years. Therefore, it is recommended that the school develop databases at the time of enrollment, and update at the start of 2nd and 3rd grades.</li> </ul>
After graduation	<ul style="list-style-type: none"> <li>• Collect the information of place of works from graduates. It is possible to efficiently find the graduates who started working at companies by contacting graduates who sought to work in their school days with priority referring to desired career data collected in their school days.</li> <li>• Add the column of “Place of works” on 31 students database and input data</li> <li>• Find companies to partner with referring to the information on the database.</li> </ul>



**Cost**

No additional cost is necessary (because the existing database can be utilized)

<sup>2</sup> The 31 new students database contains the basic students’ information. Each school keeps the database during students’ school years (three years) and for two to three years after their graduation.

### 6.3 Example activities in Partnership with Companies

Although how technical secondary schools partner with companies differs between the Dual Schools and the conventional technical secondary schools, it mainly involves the following four activities:

- 1) Career advice by graduates (Graduate Advisory Session)
- 2) Company briefings for the students at school
- 3) Company visits
- 4) Company internships

Specific examples of each activity are presented in the tables in the following pages.

#### Activity Log Sheet:

Create a sheet as follows to log activities. This enables the parties concerned at the school to share data on the companies that the school partnered with in the past.

No	Date	Grade	Department	Class	Responsible of implementation	Number of participants		Name of company	Type of activity
						Male	Female		
1									
2									



Item	Description
Name of activity	Career advice by graduates (Graduate Advisory Session)
Outline	The graduates who started working after graduation talks about their own personal experiences to the current students at school.
Place	School
Steps for organizing the activity program	<ol style="list-style-type: none"> <li>1) Select appropriate graduates who has a job and request them to participate in the sessions.</li> <li>2) Prepare the guidance to graduates to explain what experiences and advice should be included in their speeches to the students.</li> <li>3) Implement the session.</li> </ol>
Program example	<ol style="list-style-type: none"> <li>1) Opening statement: Principal (5 min)</li> <li>2) Objectives and agenda: WTU (5 min)</li> <li>3) Questionnaire survey before the Session: WTU (10 min)</li> <li>4) Speeches by Graduates (40 min) <ul style="list-style-type: none"> <li>*The speech includes: <ul style="list-style-type: none"> <li>• How they decided their career paths;</li> <li>• What kind of efforts/preparation they made to find jobs;</li> <li>• What difficulties they faced in finding their jobs;</li> <li>• What competencies are required at their work place; and</li> <li>• Any advice to students for deciding their future career path.</li> </ul> </li> </ul> </li> <li>5) Group discussions (45 min) <p style="margin-left: 40px;">The students separate into 4 groups, 1 for each graduate and participate in group discussions.</p> </li> <li>6) Questionnaire survey after the Session: WTU (10 min)</li> <li>7) Closing remarks: Principal (5 min)</li> </ol>
Role of the school	<p>Request and coordinate with the graduates.</p> <p>Set up the venue and manage the event.</p> <p>Conduct a questionnaire survey to students before and after the session.</p>
Intended participants	<p>Conventional: All school grades (third year students recommended)</p> <p>Dual: All school grades</p>
Notes	<p>✓ Selection of the graduate: The same company may have different jobs in different departments, so select the graduates from a</p>

	<p>variety of departments, such as manufacturing, quality control, or accounting. Also note that if the graduate explains how the four competencies are needed in their positions, it will further deepen the students' understanding.</p> <ul style="list-style-type: none"><li>✓ Explain the following to the graduate in advance. a) Purpose: to motivate students for the various school activities by having them understand what is involved in actual work. b) What should be included in the speech. (including four competencies)</li><li>✓ Number of graduates: about 4</li></ul>
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<b>Item</b>	<b>Description</b>
Name of activity	Company briefings for the students at school
Outline	Company presents hiring information at school.
Place	School
Steps for organizing the activity program	<ol style="list-style-type: none"> <li>1) Select companies.</li> <li>2) Make appointments to visit.</li> <li>3) Negotiate the program.</li> <li>4) Implement the program (See the program below).</li> <li>5) Organize discussion session for students to share what they learned.</li> </ol>
Program example	<ol style="list-style-type: none"> <li>1) Opening Remark (Principal)</li> <li>2) Representative from the company gives a presentation on the following: <ul style="list-style-type: none"> <li>• Company outline</li> <li>• Qualifications required for employment, including academic background, academic grades, competencies, etc.</li> <li>• Career path after employment (job positions and necessary competencies)</li> <li>• Career paths of graduates at the company (if graduates are employed at the company)</li> <li>• Work environment (location of the company, availability of employee cafeteria, etc.)</li> <li>• Terms of employment (salary, pay rise, work hours, holidays)</li> <li>• Next hiring (number of hires planned, schedule, etc.)</li> </ul> </li> <li>3) Q&amp;A Session</li> <li>4) Closing Remark (Principal)</li> </ol>
Role of the school	<p>Request and coordinate with companies.</p> <p>Set up the venue and manage the event.</p>
Intended participants	<p>Conventional: Students of all grades and their parents/guardians.</p> <p>Dual: Prospective students and their parents/guardians (activity held at the time when inviting student applications). If necessary, the activity is also held before graduation of the third year students.</p>



VARIANT	<ul style="list-style-type: none"><li>• <b>Briefings for parents/guardians:</b> Parents/guardians also have a misunderstanding that higher education directly translates to higher pay, so they encourage the students to continue their studies. Briefings for parents/guardians are also recommended for clearing this misunderstanding.</li><li>• <b>Briefings by graduates:</b> Participation of graduates is recommended if there are any working in the company (If there is no candidate, the school can invite graduates from neighborhood schools.) Hearing personal stories of what the graduates do at the company helps the students feel closer to the idea of getting an employment at the company.</li></ul>
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Item	Description
Name of activity	Company visits
Outline	Show the students the actual workplace for higher impact than company briefings.
Place	Company sites (factory/office)
Steps for organizing the activity program	<ol style="list-style-type: none"> <li>1) Select companies.</li> <li>2) Make appointments to visit.</li> <li>3) Negotiate the visiting program.</li> <li>4) Prepare visit memos to be written by students.</li> <li>5) Implement visits (See the program below).</li> <li>6) Collect students' visit memos, analyze them and share the results with companies.</li> </ol>
Program example	<ol style="list-style-type: none"> <li>1) Opening Remark (Representative from the company)</li> <li>2) Representative from the company gives a presentation on the following: <ul style="list-style-type: none"> <li>• Company outline</li> <li>• Qualifications required for employment, including academic background, academic grades, competencies, etc.</li> <li>• Career path after employment (job positions and necessary competencies)</li> <li>• Work environment (location of the company, availability of transportation service, company dormitory, employee cafeterias, etc.)</li> <li>• Terms of employment (salary, pay rise, work hours, holidays)</li> <li>• Next hiring (number of hires planned, schedule, etc.)</li> </ul> </li> <li>3) Tour of the workplace (factory/office)</li> <li>4) Q&amp;A Session</li> <li>5) Closing Remark</li> </ol>
Role of the school	<p>Request and coordinate with companies (including making arrangement for bus transport; discussion with the company in advance is also recommended to request that explanations at the tour make connections between the four competencies to the actual work being done there).</p> <p>Lead students</p>

Intended participants	Conventional: All school grades (lower grades recommended) Dual: All school grades (the same company may have different work in different departments, so it would be better if the students could see a variety of departments)
Student assignments	After the visit, students are to submit a visit memo to the school. The school sums up and analyzes the memos and shares the results with the company. If the format of the memo contains different sections for the four competencies, it would help students have a clearer sense of purpose for the visit.
VARIANT	<ul style="list-style-type: none"> <li>• Visits by the teachers</li> <li>• Visits by the parents/guardians</li> <li>• Briefings by graduates</li> </ul>



<b>Item</b>	<b>Description</b>
Name of activity	Company internship
Outline	Students actually experience work for higher impact than company visits.
Place	Company sites (factory/office)
Program example	This internship is a part of curriculum at Dual Schools. For conventional technical secondary schools, the ideal is to have internships at companies related to the skills that the students are learning at school, but if there is no company nearby that fits the description, it would still be good to experience internship at companies (factories/offices) of other industry sectors or at government agencies, because it allows the students to at least have experience regarding SB, 3S, and TM. Internship should be about one to four weeks each, with one or two internships a year.
Role of the school	Request and coordinate with companies, review feedback from the companies and instruct students.
Intended participants	General: All school grades (third year students recommended) Dual: All school grades
Student assignments	Evaluation by the student: Students' evaluation at the end of the internship gives the school details of the internship and what achievements were made, while the companies will have a clearer idea on what improvements they can make for accepting interns.



## Considerations for internship at Dual Schools

- **When inviting student applications:** If the students and the parents/guardians are not aware of the various conditions of the company (training description, number of persons to be hired, terms of training, commute method, training hours), there could be various troubles after the student enters school. The school and MOETE have the obligation to make sure that these points are explained to the students and their parents/guardians when inviting applications for the school. Therefore, the school must obtain this information and provide it to the students and parents/guardians, or make arrangements to have the company present this information.
- **Communication from the school to the company:** Before the start of the internship, a) the school explains to the company that the school focus on the four competencies in the training, and b) the school requests the company to place focus on the four competencies during the internship.
- **Monitoring of the company by the school:** After the start of the internship, teachers regularly visit the company to check that a) the company is instructing students on the four competencies and b) there is no issue with the student in terms of being tardy/absent or training behavior. If any issues are found, discussion is held with the company and parents/guardians, to make prompt improvements. The school also works with the Regional Unit for the improvement. The results of the monitoring by the teacher are shared with the company and the school, regardless of how good or bad the results are.
- **Participation of the parents/guardians:** The understanding and cooperation of the parents/guardians are essential for the success of the internship. In order to promote mutual understanding among the parties concerned, periodic meetings to exchange opinions (about twice a year) are held with the participation of the company, school, parents/guardians, student etc. This meeting to exchange opinions includes discussion on the role of the parties (ex. School, companies), education policies of the school, company outline and what competencies the company seeks in its employees, qualifications required for employment, terms of employment, and career path after employment, as well as stories of the Dual School student's experience, a factory visit, and Q&A.



### **Advance**

#### Collecting companies' information and providing to students

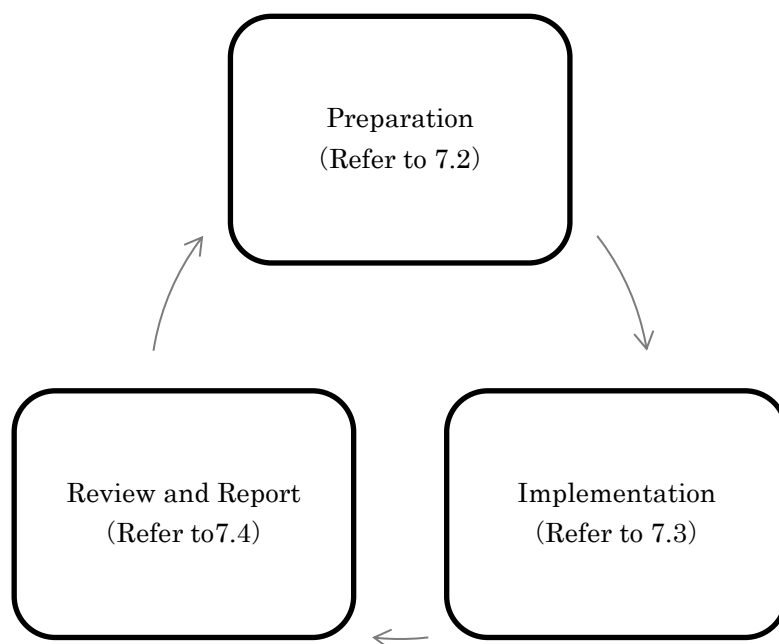
The schools can gain various information on companies by deepening their partnerships through the above example. Collecting information and providing the list to students would give opportunities to students to reconsider their career path. It is possible for students who seek to study after graduation to consider changing their desired career to finding a job. Keeping this in mind, it is recommended that the schools provide the information to students.

## Chapter 7. Standard Implementation Process for This Guideline

This chapter shows the standard implementation process that schools can follow to introduce the instruction methods in this guideline.

### 7.1 Outline of the Implementation Process

In the first year, preparations are made for the introduction of the instruction methods in this guideline. Once preparations are made, the instruction methods are implemented, and the outcomes are reviewed and reported. In the next year, preparations are made again based on the implementation status and outcomes of the first year. The school repeats this cycle every year.



The key to success is to gain the understanding and support of all teachers, parents/guardians, and the Work Transition Unit to build a concerted effort that involves all parties concerned with the school, during the preparation phase in the first year of implementation. If there are local companies nearby, it is a good idea to engage them as well.

Progress is tracked and managed by the principal, together with the Idara and Mudiriya. In order to manage the progress appropriately, the school needs to make evidence of the implementation result (such as documents indicating that activities have been carried out, or documents indicating the achievement level of activities, etc) and store them after each activity in the process has been carried out. Making a folder for implementation progress management of this guideline will be useful.

## 7.2 Preparation

Preparation must be finished one week before the start of the new academic year.

### (1) In-school training to ensure understanding of all teachers

In the first year of introducing this guideline, MOETE holds a training on the guideline. After the MOETE training, the principal, together with the teachers who participated in MOETE training, promptly holds an in-school training on this guideline for all teachers at their school. From the second year, in-school training is held for those who have not participated in the training yet, for example a new teacher, to ensure that all teachers understand the guideline and are able to instruct accordingly.



#### Persons concerned and their roles:

Person-in-charge	Main roles
Principal	✓ Person responsible for holding the in-school training ✓ Assessment of the activity
Teachers who participated in MOETE training	✓ Hold the in-school training



#### Evidence to keep

- ✓ In-school training records



**An example of activity summary**

Item	Recommendation
Date	August or September
Standard hours of training	9 hours (in 2 to 3 days)
Achievement test	Should do after training
Training participants	All teachers who have not participated in the training yet. If the number of participants is too large for a single training, cascade the training within the school or separate teachers into some groups and hold multiple trainings.
Distribution materials	The school receives printed copies of the guideline from MOETE and distributes them to all teachers, requiring them to read through before the training (MOETE distributes the printed guideline to be in time for the in-school trainings).



**Example of the Training Program:**

Schedule	Chapter	Standard Period	Participant
Day1	Chapter 1	40 min	All teachers
	Chapter 5	40 min	
	Chapter 6	40 min	
	Chapter 7	60 min	
	Achievement test	30 min	
Day2	Chapter 2	90 min	Teachers for theoretical lessons and practical lessons
	Chapter 3	45 min	
	Chapter 4	45 min	
	Achievement test	30 min	





**Assessment by a Principal :**

<b>No.</b>	<b>Assessment Items</b>	<b>Target</b>	<b>Assessment Methods</b>
1-1	Date of in-school training	Training held before start of the academic year	Check in-school training records
1-2	% of teachers who participated in the training	90% or more teachers participate in the training	Check in-school training records

## (2) Preparation at the departments for practical lessons

Each department, led by the head of the department, carries out the activities described below. When making these preparations, departments must note what requests must be made to the parents/guardians (obtaining the work cloth that conforms to the dress code or the items used in the practical lessons).

- For PR: Production according to request
  - Decide the number of groups the class will be divided into, taking into consideration the number of teachers for practical lessons and equipment used.
  - Adjust a practical lessons plan in line with the number of groups.
  - Draft a practical lessons plan. Break down practical lessons into small steps, making sure to include steps for checking the requirements, carrying out the work, and confirming the results.
- For SB: Safe behavior
  - Create a basic dress code and make a poster to display it in a visible place in the workshop.
  - Create basic standards for safe behavior and display the summary in a visible place in the workshop.
  - Establish a standard work environment (for example, indicate separate safety zones with markers and tapes when dangerous tools and/or machines are used).
  - (If necessary) set up work specific dress codes, work environment, and standards for safe behaviors for each work. Obtain necessary equipment/supplies and establish an appropriate environment.
- For 3S: Sort/set in order/shine
  - Implement 3S( Sort, set in order, and shine (clean)) in the workshop by teachers.
  - Create rules for 3S (sort/set in order/shine) in the workshop. Display the rules inside the workshop.



### **Persons concerned and their roles:**

Person-in-charge	Main roles
Principal	✓ Control all activities.
Head of departments	✓ Lead the activities to prepare for practical lessons
Practical Teachers in each department	✓ Prepare for practical lessons with regard to SB and 3S ✓ Work together with teachers for theoretical lessons to create an annual plan (PR) ✓ Draft lesson plans for practical lessons (PR)



### **Assessment by a Principal**

<b>No.</b>	<b>Assessment Items</b>	<b>Target</b>	<b>Assessment Methods</b>
2-1	Practical lesson plan	Plan is developed for small groups	Review the practical lesson plan
2-2	Lesson plans for the practical lessons	Practical lessons are broken down into small steps, and include steps for checking the requirements, carrying out the work, and confirming the results	Sample check lesson plans for the practical lessons
2-3	Basic dress code	A poster is displayed in a visible place in the workshop	Visit the workshop
2-4	Basic standards for safe behavior	A poster is displayed in a visible place in the workshop, or a booklet containing the guideline is made available	Visit the workshop
2-5	Standard work environment	Standard work environment is established (layout and aisle design taking safety into consideration, etc.)	Visit the workshop
2-6	Work-specific dress code, work environment, and standards for safe behavior (optional)	A poster is displayed in a visible place in the workshop. Work-specific work environment is established.	Visit the workshop
2-7	3S (sort/set in order/shine) of each workshop	3S (sort/set in order/shine) is implemented.	Visit the workshop
2-8	Rules regarding 3S (sort/set in order/shine)	The rules are displayed in a visible place in the workshop	Visit the workshop



### **Evidence to keep**

- ✓ Assessment result by a Principal

### (3) Preparation to instruct “TM: Time Management”

The principal will take the initiative in implementing the following:

- Create a standard for the preparation time for the next class and communicate it to the students
- Introduce system that allows the teachers and the students to know the time to start the next class (e.g., Wall clocks, a bell etc.)
- Communicate to the students what responses are to be provided if they fail to follow the standard for time management behavior (tardiness)



#### **Persons concerned and their roles:**

Person in charge	Main roles
Principal	<ul style="list-style-type: none"><li>✓ Discuss with the teachers and create a standard for the preparation time for the next class, and communicate the standard to the teachers</li><li>✓ Discuss with the teachers and decide how to tell the start time of class, and communicate it to the teachers.</li><li>✓ Communicate to the teachers the standard for time management behavior of the school and MOETE</li><li>✓ Designate and supervise the teacher preparing for instruction</li></ul>
Teacher in charge A	<ul style="list-style-type: none"><li>✓ Prepare and display of timetables</li></ul>
Teacher in charge B	<ul style="list-style-type: none"><li>✓ Install system to know time, formulate management plans, and create management tools</li></ul>
Social Specialist	<ul style="list-style-type: none"><li>✓ Prepare for and implement communication of the time management behavior standard to the students</li></ul>



### **Assessment by a Principal (Example)**

As the contents differ in each school, change the assessment depending on the situation.

<b>No.</b>	<b>Assessment Items</b>	<b>Target</b>	<b>Assessment Methods</b>
3-1	Display of timetable in the classroom	Timetable is displayed in every classroom (including workshops)	Visit the classroom
3-2	Installation/maintenance of wall clocks in classrooms	Wall clocks are installed in every classroom (including workshops)	Visit the classroom
3-3		Clock shows correct time	Visit the classroom
3-4	Communicate the time management behavior standard to the students	Prepared to communicate the standard to the students	Hearing to the Social Specialist



### **Evidence to keep**

- ✓ Assessment results by a Principal

#### (4) Setting goals for each competency

Goals and target values are set for each competency so that the effect of improving the instruction methods may be identified. It is recommended that all departments share the same goals and target values for the first year. From the second year, goals and/or target values may be changed for each department depending on the individual situation; however, it is desirable to have common goals/target values as much as possible because it allows comparison of progress among the departments. The following goals and target values are recommended for the first year. The goals and target values are presented and approved at the school staff meeting.



#### First year goals and target values for the competencies (example):

Competency	Goal	Target Value
PR: Production according to request	Increase the percentage of students who achieve the passing level for the piece of work made during practical lessons	60%
SB: Safe behavior	Increase the percentage of students who conform to the dress code for practical lessons	95%
3S: Sort/set in order/shine	Increase the percentage of sort/set in order/shine executed after practical lessons	100%
TM: Time management	Increase the percentage of students who are present in the workshop at the start of the practical lesson	95%



#### Persons concerned and their roles:

Person-in-charge	Main roles
All teachers	✓ Approve the goals and target values at the school staff meeting
Head of departments	✓ Hold a joint meeting to formulate the goals and target values ✓ One representative presents the goals and target values at the school staff for approval

**Assessment by a Principal :**



No.	Assessment Items	Target	Assessment Methods
4-1	Goal setting	Goals are set and they are reasonable	Check minutes of the school staff meeting
4-2	Target value setting	Target values are set and they are reasonable	Check minutes of the school staff meeting



**Evidence to keep**

- ✓ Minutes of Staff Meeting

## (5) Communication to the parents/guardians

“TM: Time management” requires students to make improvements to their lifestyles, which needs the understanding and cooperation from the parents/guardians. In addition, for some departments, “SB: Safe behavior” may also involve making requests to the parents/guardians to purchase certain work clothes that conforms to the dress code. Purchase of work clothes that conforms to the dress code requires communication to the parents/guardians in advance to fully examine whether it is necessary before making the final request, in part to allow consideration for the financial situations of the students’ households. Communication to the parents/guardians may be made by asking them to come to school to attend a communication meeting, or by sending out letters.

The following is a suggestion on what should be included in the communication.

- 1) Outline of the four competencies
- 2) Requests for cooperation of the parents/guardians (examples)
  - a) Requests with regard to TM: Time management (support for building a daily routine to prevent tardiness)
  - b) Requests with regard to SB: Safe behavior (purchase the work cloth that conforms to the dress code)



### Persons concerned and their roles:

Person-in-charge	Main roles
Social Specialist	✓ Plan the explanation to parents/guardians and implement it

### Evidence to keep :



- ✓ School Record



### Assessment by a Principal :

No.	Assessment Items	Target	Assessment Methods
5-1	Date of the communication with the parents/guardians	Communicate to the parents/guardians by the start of the new academic year (communication meeting, letter, etc.)	Check school records
5-2	Number of parents/guardians who received the communication	Communicate to 70% or more parents/guardians	Check school records



### 7.3 Implementation

Implementation takes place throughout the academic term.

#### (1) Student orientation regarding practical lessons

Each department hold an orientation as soon as possible after the start of the academic year, before practical lessons start. The orientation is basically for the first year students, but must be attended by second and third year students in the first year of implementation of the guideline. In the orientation:

- the four competencies are explained in detail, together with their importance;
- the dress code and safety standards are explained, with information on what to wear for practical lessons;
- the concept of punctuality and the consequences for tardiness are explained



#### Persons concerned and their roles::

Person-in-charge	Main roles
Teachers in each department	✓ Plan and hold the orientation



#### Evidence to keep :

- ✓ Lesson Record



#### Assessment by a Principal :

No.	Assessment Items	Target	Assessment Methods
1-1	Holding the orientation	Orientation is held before the start of practical lessons	Check class records

## (2) Implementation of improved practical lessons

Implement the content described in Chapters 2 to 4 in practical lessons. Implement the content described in Chapters 5 in whole school.



### Persons concerned and their roles::

Person-in-charge	Main roles
Teachers in each department	✓ Deliver improved practical lessons



### Evidence to keep :

- ✓ Practical Lesson Plan
- ✓ Record (work clothes, execution of sort/set in order/shine after lessons, etc.)

## 7.4 Review and Report

Review and Report also takes place throughout the academic term.

### (1) Measuring/recording target values for the competencies

The teacher for practical lessons keeps a record for the defined goal and target value of each competency. The recommended format for the record is as shown below.

#### Example in Conventional School

Review twice a year.



Compe- -tency	Goal	Target Value	Measured Value	
			Oct	Mar
PR	Increase the percentage of students who achieve the passing level for the piece of work made during practical lessons	60%		
SB	Increase the percentage of students who conform to the dress code for practical lessons	95%		
3S:	Increase the percentage of sort/set in order/shine executed after practical lessons	100%		
TM	Increase the percentage of students who are present in the workshop at the start of the practical lesson	95%		



**Example in Dual School**

Record twice (immediately after the start of the practical lesson period class and before the end of the practical lesson period).

Compe -tency	Goal	Target Value	Measured Value	
			Start	End
PR	Increase the percentage of students who achieve the passing level for the piece of work made during practical lessons	60%		
SB	Increase the percentage of students who conform to the dress code for practical lessons	95%		
3S:	Increase the percentage of sort/set in order/shine executed after practical lessons	100%		
TM	Increase the percentage of students who are present in the workshop at the start of the practical lesson	95%		



### Frequency of Measurement

The purpose of measuring and recording target values is for the school's self-evaluation. It is best to measure and record the levels of competency in each class in order to understand the student's degree of competency more accurately, but it is also possible to select classes **randomly** in each department.



### Measurement by Random Sampling (example)

In a mechanical department of a certain school, 6 lessons were randomly selected in October to measure the percentage of students following the dress code in practice lessons.

Grade and Class	Date of measurement	Number of Attendee (A)	Number of Attendee following dress code(B)	Measured value (B/A)
Grade1-Class1	3 ,October	15	10	67%
Grade1-Class1	4,October	18	18	100%
Grade2-Class1	7,October	20	15	75%
Grade2-Class2	3, October	17	15	88%
Grade3-Class1	10, October	20	15	75%
Grade3-Class2	3, October	18	18	100%
Total		108	91	84%

Later, the records are aggregated within the department and presented at the school staff meeting by a representative of the department.



### Persons concerned and their roles:

Person-in-charge	Main roles
Head of department	✓ Compile competency records for each department
Practical teacher of each department	✓ Measure and record of each competency of their class



**Evidence to keep**

- ✓ Record of competencies



**Assessment by a Principal**

No.	Assessment Items	Target	Assessment Methods
1-1	Check records of each competency	Records of each competency are kept	Check the records

## (2) Assessment of Practical Lessons

In this guideline, practical lessons are assessed from a perspective of whether the lessons are conducted according to the practical lesson flow. The assessment is performed by Practical Lesson Assessment Form (Assessment of Teachers' Action). It is not necessary to assess all lessons. At least one or more practical lessons are assessed for each department during the year, to be utilized for providing guidance to the teachers.



### Persons concerned and their roles::

Person-in-charge	Main roles
Head of departments	✓ Assess practical lesson of his/her department and provide guidance to the teachers for their improvement



### Evidence to keep

- ✓ Practical Lesson Assessment Form



### **Assessment by a Principal**

No.	Assessment Items	Target	Assessment Methods
2-1	Practical Lesson Assessment Form	Practical lesson assessment for each teacher is done at least one lesson per year	Check record

## Practical Lesson Assessment Form (Assessment of Teachers' Action)

### Lesson Information

<b>Name of School</b>		<b>Name of Mudiriya</b>	
Name of Department		Name of Idara	
Grade		Date of Assessment	
Name of Teacher		Name of Assessor	

### 1. Roll call at the start of the practical lesson

<b>No.</b>	<b>Type of Competency</b>	<b>Assessment Item</b>	<b>Yes/No</b>	<b>Quality of actions (validity of the actions, etc.)</b>
1-1	TM	The teacher provides response to the tardy student according to the standard, and asks the reason for being late. Give instructions as necessary.		
1-2	SB	The teacher checks what the students are wearing. If there are any students who do not follow the dress code, the teachers has them correct it on the spot.		



2 First explanation given after breaking up into groups

No.	Type of Competency	Assessment Item	Yes/No	Quality of actions (validity of the actions, etc.)
2-1	PR	<p>【 Check requirements 】 The teacher explains the following repeatedly until the students understand and also shows samples when necessary.</p> <ul style="list-style-type: none"> <li>· Overall work process and the process covered in the lesson</li> <li>· The objective of the work</li> <li>· Requirements (specification documents, circuit diagrams, etc.)</li> <li>· Basic theory</li> <li>· Names and functions of machinery/equipment and tools</li> </ul>		
2-2	SB	The teacher explains the safety standards related to the work process in the lesson.		
2-3	3S	Teacher asks the students to collect the tools/parts/materials necessary for the work in the lesson.		

3. During work

No.	Type of Competency	Assessment Item	Yes/No	Quality of actions (validity of the actions, etc.)
3-1	PR [Work]	The teacher walks around the room to check whether the students are doing their work correctly. If not, the teacher instructs the student as many times as needed until the student is able to do the work correctly.		
3-2	PR [Confirm results]	The teacher instructs the students to frequently check whether the results of their work meet the requirements. If, as a result, the work does not meet the requirements, the teacher instructs the student to check the requirements again and do the work.		
3-3	SB	The teacher checks every student is doing work by following the safety standards. If a student is found to be doing work in an unsafe manner, communicate this to the student and show how it is done correctly.		
3-4	3S	The teacher checks every student is doing work by following the 3S standards. If a student is found to be not doing work in an 3S manner, communicate this to the student and show how it is done correctly.		

## 4 After work

No.	Type of Competency	Assessment Item	Yes/No	Quality of actions (validity of the actions, etc.)
4-1	PR	Teacher explains the summary of the practical lesson of the day. If there is an example of a serious mistake, the teacher communicates it to all the students and encourages them to think why the mistake happened.		
4-2	3S	The teacher instructs the students to clean the tools, machinery/equipment, and machines to remove any dust or dirt, and to return them to designated storage locations.  The teacher instructs students to clean the workshop following the rules for cleaning.		
4-3	SB	If there was any work performed in a way that may cause danger, the teacher gives feedback to the students on safety during work covered in the lesson.		

### (3) Information sharing at school staff meetings

In order for the students to acquire the four competencies, all teachers in the school must work together. For this reason, school staff meetings should be held more frequently to review progress. It is recommended that school staff meetings are held with the themes listed below on a monthly basis; however, changes can be made according to the situation in each school.



#### Example of Staff Meeting Agenda

Date	Agenda
September (a few days before the academic year)	<ul style="list-style-type: none"> <li>✓ The principal communicates the significance of introducing the guideline to all teachers.</li> <li>✓ The principal announces that tackling tardiness and sorting waste will be an all-school effort.</li> <li>✓ The head of each department presents the preparation status for the practical lessons in their department.</li> <li>✓ Social Specialist gives a report on the status of communication to the parents/guardians.</li> </ul>
October	<ul style="list-style-type: none"> <li>✓ Representative from each department presents the results of the student orientation.</li> </ul>
November	<ul style="list-style-type: none"> <li>✓ Representative from each department presents the progress of instructing 4 competencies and on the activities that are held in partnership with the company.</li> </ul>
December	<ul style="list-style-type: none"> <li>✓ Same as above</li> </ul>
January	<ul style="list-style-type: none"> <li>✓ Representative from each department gives an overview and status report for the first semester on the students' learning with regard to the four competencies. Plans for improvement are also presented as necessary.</li> <li>✓ Representative from each department gives a status report on the activities held in partnership with the company.</li> </ul>
February	<ul style="list-style-type: none"> <li>✓ Representative from each department presents the progress of instructing the four competencies and on the activities that are held in partnership with the company.</li> </ul>
March	<ul style="list-style-type: none"> <li>✓ Same as above</li> </ul>
April	<ul style="list-style-type: none"> <li>✓ Representative from each department gives an overview and status report for the year on the students' learning with regard to the four competencies. Plans for improvement are also presented as necessary.</li> </ul>



**Persons concerned and their roles:**

Person-in-charge	Main roles
Principal	✓ Call of staff meeting
Teachers	✓ Participation in staff meetings and reporting



**Evidence to keep :**

- ✓ Minutes of Staff meeting (or agenda)

**(4) Reporting to Idara/Mudiriya/MOETE**

Every April, an annual report of the results for the year is sent to Idara/Mudiriya/MOETE. The recommended format for the report is shown below.



**Sample Achievement Report Format to Idara/Mudiriya/MOETE**

Achievement Report: School Year 2018-2019

Name of School:

Date of

Submission:

(1) Outcome:

Compe -tency	Goal	Target Value	Measured Value
PR:	Increase the percentage of students who achieve the passing level for the piece of work made during practical lessons	60%	
SB:	Increase the percentage of students who conform to the dress code for practical lessons	95%	
3S:	Increase the percentage of cleaning done after practical lessons	100%	
TM:	Increase the percentage of students who are present in the workshop at the start of the practical lesson	95%	

(2) Issues:

(3) Plan to solve the issues:

End



**Persons concerned and their roles:**

Person-in-charge	Main roles
Principal	✓ Approval of the report and report to Idara/Mudiriya/MOETE ✓ Assign teacher(s) for writing a report
Person in charge of writing report	✓ Write a report



**Evidence to keep**

- ✓ Report

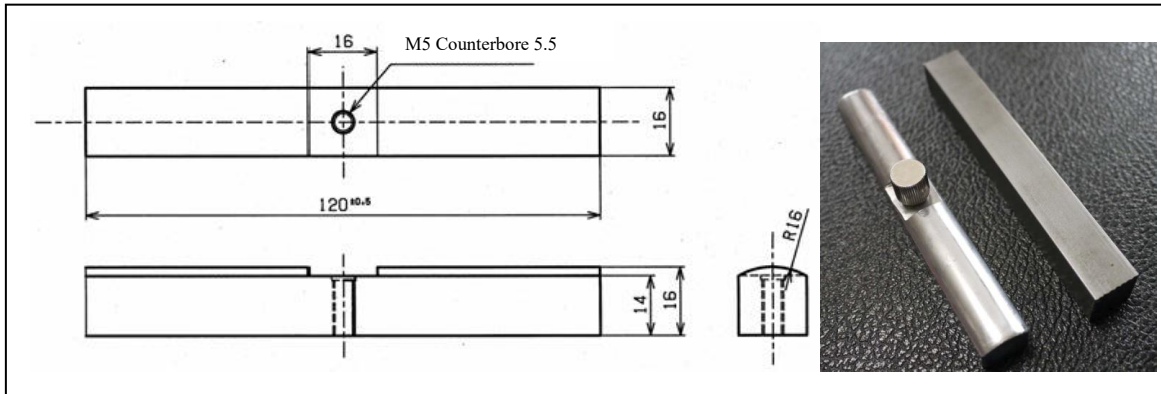
**Lesson Plan**  
**(Mechanical/Electronics)**



# Title: Hand Finishing

## (1) Explanation:

In this operation, a paper weight (shown in the drawing below) is produced by using files and a drilling machine.



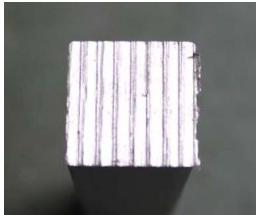

## (2) Working Process :

Process No	Process	Expected Time
Process 1	End surface - Finishing	3 hours
Process 2	R Finishing for Upper Surface	3 hours
Process 3	Create Flat Space for Knob on Top Surface	3 hours
Process 4	Drilling	3 hours
Process 5	Tapping	3 hours
Process 6	Counter sinking	3 hours
Process 7	Surface Finishing	3 hours
	Total	21 hours

The following pages show the lesson plans of Processes 1 and 2 as examples.

## Process 1: End Surface Finishing

<b>Duration</b>	3 hours
<b>Requirement</b>	<ul style="list-style-type: none"> <li>✓ Smoothen the end surface</li> <li>✓ Make the end surface at a right angle</li> <li>✓ Make dimensions <math>120 \pm 0.5</math> mm.</li> </ul>
<b>Tools and materials</b>	<ul style="list-style-type: none"> <li>✓ Bench vice, Jaw caps</li> <li>✓ Flat file</li> <li>✓ Try square</li> <li>✓ Wire brush</li> <li>✓ Vernier caliper</li> <li>✓ Steel (SS400)</li> </ul>
<b>Performance standards</b>	<ul style="list-style-type: none"> <li>✓ Read and understand the length and tolerance shown in the mechanical drawing.</li> <li>✓ Define the name of each part, the different types, and teeth sizes of hand files.</li> <li>✓ Learn the correct way of metal filing.</li> <li>✓ Check the right angle using a try square.</li> <li>✓ Check dimensions using a Vernier caliper.</li> </ul>

Students' target behavior	How teachers should provide instruction (*)	Method of Student Assessment
<ul style="list-style-type: none"> <li>✓ Understand the entire working process.</li> <li>✓ Understand process 1.</li> </ul>  <p>&lt; The end surface before work &gt;</p>  <p>&lt; The end surface after work &gt;</p>	<ul style="list-style-type: none"> <li>✓ Explain the entire working process, by 1) showing final product (Paper weight) to students and 2) briefly explaining Processes 1 to 7.</li> <li>✓ Explain Process 1. To make students understand the requirements of process 1, show the end surface before work and after work. Also explain the work procedure.</li> </ul>	<p>Check the level of understanding among the students by asking some of them whether they understand.</p>
<p>Understand the theory related with process 1.</p>	<p>Explain the following:</p> <ul style="list-style-type: none"> <li>✓ The purpose and the name</li> </ul>	<p>Check the level of understanding among the</p>


	<p>of each part of a bench vice and jaw caps.</p> <ul style="list-style-type: none"> <li>✓ The purpose, name of each part, types and teeth size of flat files.</li> <li>✓ The purpose of a wire brush.</li> <li>✓ The purpose and name of each part of a try square.</li> <li>✓ The purpose and name of each part of a Vernier caliper.</li> </ul>	<p>students by asking some of them whether they understand.</p>
<p>Observe teachers' demonstrations carefully and fully understand the working methods of process 1.</p>	<p>Demonstrate the below-mentioned working methods:</p> <ul style="list-style-type: none"> <li>✓ How to use a bench vice and jaw caps.</li> <li>✓ Basics of file hand grip and body posture.</li> <li>✓ How to clean a flat file by using a wire brush.</li> <li>✓ How to check the right angle by using a try square.</li> <li>✓ How to use a Vernier caliper.</li> </ul>	<p>Check the level of understanding among the students by asking some of them whether they understand during demonstration.</p>
<p>Work: Do end surface finishing</p> <ul style="list-style-type: none"> <li>✓ Fix the material firmly in a bench vice.</li> <li>✓ File properly</li> <li>✓ Clean the flat file adequately by using a wire brush</li> </ul>	<p>Move from student to student, instructing them repeatedly.</p>	<ul style="list-style-type: none"> <li>✓ Is the material firmly fixed in a bench vice?</li> <li>✓ Do students exhibit the basics of correct file hand grip and body posture?</li> <li>✓ Do students adequately clean the flat file by using a wire brush?</li> </ul>
<p><b>Confirm Result:</b> Confirm if the work result meets the requirement</p> <ul style="list-style-type: none"> <li>✓ Use a try square and verify right angle</li> <li>✓ Measure by using a</li> </ul>	<p>Moves from student to student, instructing them repeatedly.</p> <ul style="list-style-type: none"> <li>✓ Inform students of the final evaluation (If the end surfaces are right-angled, smooth and within the</li> </ul>	<ul style="list-style-type: none"> <li>✓ Right angle: Can students correctly use a try square and verify right angles?</li> <li>✓ Length and tolerance: Can students accurately</li> </ul>


<p>Vernier caliper</p> <p>✓ Check surface smoothness by looking</p>	<p>dimension tolerance)</p> <p>✓ Inform students if there is any unfulfilled condition, return to work and re-do the work.</p>	<p>measure by using a Vernier caliper?</p> <p>✓ Smoothness: Can students check surface smoothness by looking?</p>
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## Process 2: R Finishing for Upper Surface

<b>Duration</b>	3 hours
<b>Requirement</b>	<ul style="list-style-type: none"> <li>✓ Create a curved surface of R16</li> <li>✓ Smoothen the curved surface</li> </ul>
<b>Tools and materials</b>	<ul style="list-style-type: none"> <li>✓ Marking tools (Height gauge, Surface plate, V-block, bearing blue)</li> <li>✓ R gauge</li> <li>✓ Bench vice, Jaw caps</li> <li>✓ Flat files</li> <li>✓ Wire brush</li> </ul>
<b>Performance standards</b>	<ul style="list-style-type: none"> <li>✓ Read and understand R finishing dimensions shown in the mechanical drawing.</li> <li>✓ Mark the workpiece using a height gauge.</li> <li>✓ Learn the correct way to finish a curved surface using flat files.</li> <li>✓ Check the radius of finishing using an R gauge.</li> </ul>

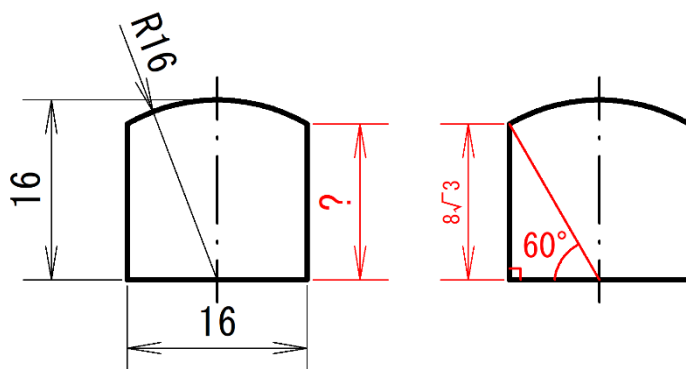
<b>Students' target behavior</b>	<b>How teachers should provide instruction (*)</b>	<b>Method of Student Assessment</b>
Understand process 2	<ul style="list-style-type: none"> <li>✓ Explain process 2 (Requirements, work procedure)</li> </ul>	Check the level of understanding among the students by asking some of them whether they understand.
Understand the theory related with process 2.	<p>Explain the following:</p> <ul style="list-style-type: none"> <li>✓ <u>The purpose and name of part of a bench vice and jaw caps.</u></li> <li>✓ <u>The purpose, name of each part, types and teeth size of a flat file.</u></li> <li>✓ <u>The purpose of a wire brush.</u></li> <li>✓ The purpose of marking tools and the name of each tool.</li> <li>✓ The purpose and name of each part of an R gauge.</li> </ul>	Check the level of understanding among the students by asking some of them whether they understand.
Observe teachers' demonstration carefully and fully understand the working	<p>Demonstrate the below-mentioned working methods:</p> <ul style="list-style-type: none"> <li>✓ <u>How to use a bench vice</u></li> </ul>	Check the level of understanding among the students by asking some of

<p>methods of process 2.</p>	<p><u>and jaw caps.</u></p> <ul style="list-style-type: none"> <li>✓ <u>Basics of file hand grip and body posture.</u></li> <li>✓ <u>How to clean a flat file using a wire brush.</u></li> <li>✓ How to finish the curved surface by using a flat file.</li> <li>✓ How to use marking tools.</li> <li>✓ How to use an R gauge.</li> </ul>	<p>them whether they understand during demonstration.</p>
<p>Work: Apply a bearing blue to the place to be marked.</p> 	<p>Move from student to student, instructing them repeatedly.</p>	<ul style="list-style-type: none"> <li>✓ A bearing blue is applied to the appropriate place to be marked.</li> </ul>
<p>Work: Place the material on the surface plate and mark out 2 mm from the edge on top surface by using a height gauge.</p>	<p>Move from student to student, instructing them repeatedly.</p>	<ul style="list-style-type: none"> <li>✓ Do students correctly use marking tools and mark the right place?</li> </ul>
<p>Work: To make a curved surface using a flat file.</p> <ul style="list-style-type: none"> <li>✓ Fix the material firmly in a bench vice</li> <li>✓ Refer to marked line while curving the top surface using a flat file.</li> <li>✓ Use a flat file to finish the outward curved surface while checking its radius using an R gauge.</li> </ul>	<p>Move from student to student, instructing them repeatedly.</p>	<ul style="list-style-type: none"> <li>✓ Is the material firmly fixed in a bench vice?</li> <li>✓ Do students exhibit the basics of correct file hand grip and body posture?</li> <li>✓ Do students adequately clean the flat file by using a wire brush?</li> </ul>

<p>✓ Clean the flat file adequately by using a wire brush</p> 		
<p><b><u>Confirm Result:</u></b> Confirm if the work result meets the requirements</p> <ul style="list-style-type: none"> <li>✓ Measure the radius using an R gauge correctly</li> <li>✓ Check surface smoothness by looking</li> </ul>	<p>Move from student to student, instructing them repeatedly.</p> <ul style="list-style-type: none"> <li>✓ Inform students of the final evaluation (Create a curved surface of R16, make the curved surface smooth)</li> <li>✓ Inform students if there is any unfulfilled condition, return to work and re-do the work.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Curved surface: Can students measure the radius using an R gauge correctly?</li> <li>✓ Smoothness: Can students check surface smoothness by looking?</li> </ul>

\*: The underlined parts in the above table have already been taught in a previous process. Teachers revise this part in accordance with students' level of understanding. This explanation can also be skipped if students have developed enough understanding.

**TIPS to improve instructions :** How does this value calculate to 2mm?



On the Right angled triangle, the ratio of the length is  
base side: oblique side : height side =1: 2:  $\sqrt{3}$ .



## Self-Evaluation by Students

Duration: 10 min

Evaluation guidelines

1. This self-assessment is for the entire working process (Process 1 to Process 7).
2. Refer to this self-evaluation sheet as a guide when performing work. Try for all items to be "Yes".
3. After the practical lesson, fill in the sheet by yourself.

SB/TM/3S

No	Items	Achievement Level		
		Good	Fair	Not good
1	SB: I followed the Standard dress code			
2	SB: I followed the Standard safe behavior guidelines			
3	TM: I was not late for class.			
4	3S: I returned tools/materials I used to their proper places.			
5	3S: I always kept the work table well-organized and cleaned it well after using.			

PR (Theory)

No	Items	Achievement Level		
		Good	Fair	Not good
1	Understand the names, types and usage of the hand taps.			
2	Understand the name of each part, different types, teeth sizes of the flat files.			
3	Read and understand R finishing dimensions shown in the mechanical drawing.			
4	Understand tapping requirements shown in the mechanical drawing.			
5	Read and understand drilling dimensions shown in the mechanical drawing			
6	Read and understand the length and tolerance shown in the mechanical drawing.			
7	Understand the place to be counter sunk shown in the mechanical drawing.			
8	Read and understand dimensions of knob space on upper surface shown in the mechanical drawing.			

9	Understand the names and types of the files set			
10	Understand usage, different types and teeth sizes of the emery cloth.			

## PR (Practice)

No	Items	Achievement Level		
		Good	Fair	Not good
1	Check the radius of finishing using the R gauge.			
2	Check dimensions of the flat space using the Vernier caliper.			
3	Mark the workpiece using the height gauge.			
4	Learn the way of using the hand tap.			
5	Learn the correct way of metal filing.			
6	Learn the correct way to use the files set			
7	Learn how to use the drilling machine.			
8	Check whether it is vertical using the try square.			
9	Learn the basic skills of using the emery cloth.			

### Student Assessment Sheet by Teacher

✓ This assessment form is for process 1 to process 7.

<b>Grade</b>		<b>Class</b>	
<b>Name</b>		<b>Department</b>	
<b>Day</b>		<b>Attendance</b>	
<b>Lesson No</b>		<b>Lesson title</b>	

SB/TM/3S

No	Items	Achievement Level		
		Good	Fair	Not good
1	SB: The student followed the Standard dress code			
2	SB: The student followed the Standard safe behavior guidelines			
3	TM: The student was not late for class.			
4	3S: The student returned tools/materials I used to their proper places			
5	3S: The student always kept the work table well-organized and cleaned it well after using.			

PR (Theory)

No	Items	Achievement Level		
		Good	Fair	Not good
1	Understand the names, types and usage of the hand taps.			
2	Understand the name of each part, different types, teeth sizes of the flat files.			
3	Read and understand R finishing dimensions shown in the mechanical drawing.			
4	Understand tapping requirements shown in the mechanical drawing.			
5	Read and understand drilling dimensions shown in the mechanical drawing			
6	Read and understand the length and tolerance shown in the mechanical drawing.			
7	Understand the place to be counter sinked shown in the mechanical drawing.			
8	Read and understand dimensions of knob space on			

	upper surface shown in the mechanical drawing.			
9	Understand the names and types of the files set			
10	Understand usage, different types and teeth sizes of the emery cloth.			

## PR (Practice)

No	Items	Achievement Level		
		Good	Fair	Not good
1	Check the radius of finishing using the R gauge.			
2	Check dimensions of the flat space using the Vernier caliper.			
3	Mark the workpiece using the height gauge.			
4	Learn the way of using the hand tap.			
5	Learn the correct way of metal filling.			
6	Learn the correct way to use the files set.			
7	Learn the way to use the drilling machine.			
8	Check whether it is vertical using the try square.			
9	Learn the basic skills of using the emery cloth.			

# Title: Connecting Resistors

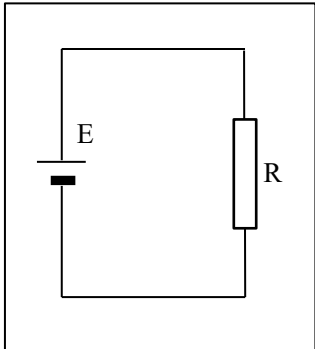
## (1) Working Process :


Process No	Process	Expected Time
Process 1	Ohm's law	3 hours
Process 2	Connecting resistors (in series)	6 hours
Process 3	Connecting resistors (in parallel)	6 hours
Process 4	Connecting resistors (in series-parallel)	6 hours
	Total	21 hours


The following pages show the lesson plan of Process 1 as an example.

## Process1: Ohm's law

<b>Duration</b>	3 hours
<b>Requirement</b>	✓ Calculate the resistance value from the measurement values of the voltage and current.
<b>Tools and materials</b>	<ul style="list-style-type: none"> <li>✓ Fixed resistors (100 <math>\Omega</math>) (This value can be changed)</li> <li>✓ DC power supply</li> <li>✓ Avometer</li> </ul>
<b>Performance standards</b>	<ul style="list-style-type: none"> <li>✓ Understand the circuit diagram.</li> <li>✓ Connect the circuit accurately.</li> <li>✓ By using an Avometer, measure the values of the voltage and current.</li> <li>✓ Write down the measurement values.</li> <li>✓ Understand Ohm's law.</li> <li>✓ Calculate the resistance value from the measurement values of the voltage and current.</li> <li>✓ Confirm whether the calculated resistance values are the same as the displayed resistance values.</li> </ul>

<b>Students' target behavior</b>	<b>How teachers should provide instruction (*)</b>	<b>Method of Student Assessment</b>
<ul style="list-style-type: none"> <li>✓ Understand the entire working process.</li> <li>✓ Understand process 1.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Explain the entire working process (Processes 1-4).</li> <li>✓ Explain process 1 (Requirements).</li> </ul>	Check the level of understanding among the students by asking some of them whether they understand.
Understand the theory related with process 1. <Circuit Diagram> 	In order to perform process 1, explain the following: <ul style="list-style-type: none"> <li>✓ Show the circuit diagram to students and explain the symbols (a DC power supply, a resistor)</li> <li>✓ Show resistor components and explain the functions and types of resistors. Explain the method of reading color codes displayed on the resistors.</li> <li>✓ Show a DC power supply and explain the purpose</li> </ul>	Check the level of understanding among the students by asking some of them whether they understand.

	<p>and name of each part.</p> <ul style="list-style-type: none"> <li>✓ Show an Avometer and explain the purpose and name of each part.</li> <li>✓ Explain the basic theory of Ohm's law.</li> </ul>							
<p>Observe teachers' demonstration carefully and fully understand the working methods of process 1.</p> <p style="text-align: center;">Table 1</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Voltage</td> <td>10V</td> </tr> <tr> <td>Current</td> <td></td> </tr> <tr> <td>Resistance</td> <td></td> </tr> </table>	Voltage	10V	Current		Resistance		<p>Demonstrates the below-mentioned working methods:</p> <ul style="list-style-type: none"> <li>✓ Write out Table.1 on the blackboard.</li> <li>✓ Connect the circuit according to the diagram.</li> <li>✓ Set a DC power supply on 10V.</li> <li>✓ By using an Avometer, measure the voltage and current. Then, fill out the measured values in Table.1 on the black board.</li> <li>✓ Calculate the resistance value and fill it out in Table.1.</li> </ul>	<p>Check the level of understanding among the students by asking some of them whether they understand during demonstration.</p>
Voltage	10V							
Current								
Resistance								
<p>Work:</p> <ul style="list-style-type: none"> <li>✓ Write out Table.1 in the notebook.</li> <li>✓ Connect the circuit according to the diagram.</li> </ul>	<p>Move from student to student, instructing them repeatedly.</p>	<ul style="list-style-type: none"> <li>✓ The circuit is connected according to the diagram.</li> </ul>						
<p>Work: Set a DC power supply on 10V.</p> 	<p>Move from student to student, instructing them repeatedly.</p>	<ul style="list-style-type: none"> <li>✓ A DC power supply is set on 10V.</li> </ul>						
<p>Work: By using an Avometer,</p>	<p>Move from student to student,</p>	<ul style="list-style-type: none"> <li>✓ The measured values are</li> </ul>						

<p>measure the values of the voltage and current. Then, fill out the measured values in Table.1.</p> 	<p>instructing them repeatedly.</p>	<p>filled out in Table.1.</p>
<p>Confirm Result: Calculate the resistance value from the measurement values and fill out the resistance value in Table.1. Check the displayed resistance value and if the calculated resistance value is the same as the displayed one, then the work is completed. If the values are different, report to the teacher.</p>	<p>Inform students that if the calculated resistance value is the same as displayed one, then the work is completed. If the values are different, instruct students to report to the teacher.</p>	<p>✓ The calculated resistance value is the same as the displayed one.</p>

<Advanced>

Students' target behavior	How teachers should provide instruction (*)	Method of Student Assessment
<p>Understand the teacher's instructions.</p>	<p>Give instructions mentioned under the students' target behavior for "Work"</p>	<p>Check the level of understanding among the students by asking some of them whether they understand</p>
<p>Work:</p> <ul style="list-style-type: none"> <li>✓ Write out Table.2 in the notebook.</li> <li>✓ Set a DC power supply on 0V.</li> <li>✓ By using an Avometer, measure the voltage and current. Then, fill out the</li> </ul>	<p>Move from student to student, instructing them repeatedly.</p>	<ul style="list-style-type: none"> <li>✓ A DC power supply is accurately set.</li> <li>✓ The measured value is filled out in Table.2.</li> </ul>



<p>measured values in Table.2.</p> <ul style="list-style-type: none"> <li>✓ Raise the voltage by 1 volt at a time. Then, by using an Avometer, measure the voltage and current and fill out the measured values in Table.2</li> <li>✓ Continue raising the voltage up to 10V in the same way.</li> </ul>		
<p>Confirm Result:</p> <ul style="list-style-type: none"> <li>✓ Calculate the resistance value from the measurement values and fill out the calculated value in Table 2. Check the displayed resistance value and if the calculated resistance value is the same as the displayed one, then the work is completed. If the values are different, report to the teacher.</li> </ul>	<p>Inform students that if the calculated resistance value is the same as displayed one, then the work is completed. If the values are different, instruct students to report to the teacher.</p>	<ul style="list-style-type: none"> <li>✓ The calculated resistance value is the same as the one displayed.</li> </ul>

Table 2

Voltage V <V>	0	1	2	3	4	5	6	7	8	9	10
Current I <mA>											
Resistor R < $\Omega$ >											

## Self-Evaluation by Students

Duration: 10 Minutes

Evaluation guidelines

1. This self-assessment is for the entire working process (Process 1 to Process 4).
2. Refer to this self-evaluation sheet as a guide when performing work. Try for all items to be "Yes".
3. After the practical lesson, fill in the sheet by yourself.

SB/TM/3S

No	Items	Achievement Level		
		Good	Fair	Not good
1	SB: I followed the Standard dress code.			
2	SB: I followed the Standard safe behavior guidelines.			
3	TM: I was not late for class.			
4	3S: I returned tools/materials I used to their proper places.			
5	3S: I always kept the work table well-organized and cleaned it well after using.			

PR (Theory)

No	Items	Achievement Level		
		Good	Fair	Not good
1	Understand the meaning of circuit diagram symbols.			
2	Understand the function and types of resistors.			
3	Understand how to read the color codes displayed on the resistors.			
4	Understand the purpose and name of each part of the Avometer.			
5	Understand the purpose and name of each part of the DC power supply.			
6	Understand the basic theory of Ohm's law.			

PR (Practice)

No	Items	Achievement Level		
		Good	Fair	Not good
1	Connect the DC power supply according to the circuit diagram.			
2	Connect resistors according to the circuit diagram.			
3	Set the DC power supply on the instructed value.			
4	Measure the value of the resistance, by using the			

	Avometer.			
5	Measure the value of voltage by using the Avometer.			
6	Measure the value of current by using the Avometer.			

### Student Assessment Sheet by Teacher

<b>Grade</b>		<b>Class</b>	
<b>Name</b>		<b>Department</b>	
<b>Day</b>		<b>Attendance</b>	
<b>Lesson No</b>		<b>Lesson title</b>	

SB/TM/3S

No	Items	Achievement Level		
		Good	Fair	Not good
1	SB: The student followed the Standard dress code.			
2	SB: The student followed the Standard safe behavior guidelines.			
3	TM: The student was not late for class.			
4	3S: The student returned tools/materials he/she used to their proper places. .			
5	3S: The student always kept the work table well-organized and cleaned it well after using.			

(Theory)

No	Items	Achievement Level		
		Good	Fair	Not good
1	Understand the meaning of circuit diagram symbols.			
2	Understand the function and types of resistors.			
3	Understand how to read the color codes displayed on the resistors.			
4	Understand the purpose and name of each part of the Avometer.			
5	Understand the purpose and name of each part of the DC power supply.			
6	Understand the basic theory of Ohm's law.			

PR (Practice)

No	Items	Achievement Level		
		Good	Fair	Not good
1	Connect the DC power supply according to the circuit diagram.			
2	Connect resistors according to the circuit diagram.			
3	Set the DC power supply to the instructed value.			

4	Measure the values of the resistance, by using the Avometer.			
5	Measure the value of voltage by using the Avometer.			
6	Measure the value of current by using the Avometer.			

# المدارس الثانوية الفنية

## دليل إرشادات تحسين الدروس العملية

### ~ التركيز على التكرار ~

SB: السلوك الآمن



PR: الإنتاج وفقًا للمواصفات



TM: إدارة الوقت



3S: التصنيف/ الترتيب/ التنظيف



**وزارة التربية والتعليم والتعليم الفني**

**جمهورية مصر العربية**

**دليل إرشادات لتحسين الدروس العملية**

**~ (من خلال التركيز على التكرار)~**

**أغسطس ٢٠١٩**

## مقدمة:

شرعت وزارة التربية والتعليم والتعليم الفني (MOETE) في مصر في إصلاح نظام التعليم الأساسي من مرحلة رياض الأطفال حتى نهاية المرحلة الإعدادية، من خلال نظام التعليم ٢٠٠٨، اعتباراً من سبتمبر ٢٠١٨، حيث بدأت في تطبيق المنهج على سنتي رياض الأطفال الأولى والثانية والصف الأول الابتدائي وسوف تستمر في تطبيقه على السنوات التالية تبعاً حتى عام ٢٠٣٠. نحن نعمل على تغيير الطريقة التي يتعلم بها الطلاب لإعداد شباب مصر للنجاح في عالم مستقبلي لا يمكننا أن نتخيله بشكل كامل. وتستند أسس نظام التعليم ٢٠٠٨ على الدستور، الذي يعطي الأولوية لضرورة "بناء شخصية" الأطفال المصريين، وتطوير مهاراتهم في التفكير العلمي والناقد، وتعزيز قيمهم، وغرس شعور عميق بالمواطنة وتعزيز قيم التسامح وقبول التنوع.

تعتبر القوى العاملة في مصر أحد أعظم مواردها. ولذلك، يصبح الإصلاح الموازي للتعليم والتدريب الفني والمهني مسألة ذات أهمية قومية كبيرة من أجل ضمان أن يصبح هذا النوع من التعليم اختياراً جذاباً لخريجي نظام التعليم الجديد ٢٠٠٨ في عام ٢٠٢٧. لذلك، شرعت وزارة التربية والتعليم والتعليم الفني (MOETE) في إصلاح التعليم الفني (التعليم الفني ٢٠٠٨) اعتباراً من سبتمبر ٢٠١٩.

تهدف وزارة التربية والتعليم والتعليم الفني من خلال نظام التعليم الفني ٢٠٠٨، إلى تزويد الطلاب بثلاث جدارات: (١) الجدارات المهنية، (٢) الجدارات الأكاديمية والثقافية، (٣) الجدارات الحياتية. ولتحقيق الجدارة رقم (١) أي الجدارات المهنية، والتي تعد من الجدارات الرئيسية في المدارس الثانوية الفنية، قامت وزارة التربية والتعليم والتعليم الفني بإعداد هذا الدليل الإرشادي بالتعاون مع اليابان، استرشاداً بنموذج التعليم الفني الياباني. ومن خلال تطبيق هذا الدليل الإرشادي في كل مدرسة، سوف تصبح المدرسة الثانوية الفنية خياراً جذاباً للأجيال الشابة وكذلك لأولياء أمورهم.

إنني أطلب من كل واحد منا أن نتكاتف جميعاً من أجل تحقيق هذا الهدف المتمثل في تحويل نمط الحياة في مصر من خلال التعليم الفني من أجل استعادة روح التميز والقيادة والحضارة المصرية العريقة.

تحياتي الحارة لأطفالنا الذين سيبدأون هذه الرحلة وعميق احترامي وامتناني لمعلمينا العظماء.



د. طارق جلال شوقي

وزير التربية والتعليم والتعليم الفني



## شكر وتقدير:

تفخر وزارة التربية والتعليم والتعليم الفني بتقديم هذا الدليل الإرشادي، مع الفيديوهات التعليمية المصاحبة. ويعد هذا العمل هو نتيجة الكثير من التشاور، والكثير من التفكير، والكثير من الجهد.

وتود وزارة التربية والتعليم والتعليم الفني (MOETE) أن تعرب عن تقديرها العميق "لوحدة إدارة المشروع" في "مشروع تحسين التعليم الثانوي الفني"، والذي تم إنشاؤها في أبريل ٢٠١٧ في إطار التعاون بين وزارة التربية والتعليم والتعليم الفني والوكالة اليابانية للتعاون الدولي (جايجا). كما تعرب وزارة التربية والتعليم والتعليم الفني عن امتنانها العميق لسيادة نائب وزير التربية والتعليم والتعليم الفني، ومستشاري الوزير للتعليم الفني، ورئيس قطاع التعليم الفني. كما نتقدم بخالص التقدير إلى مدارسنا النموذجية حيث جرى بالفعل تطبيق هذا الدليل الإرشادي (مدرسة أحمد زويل، ومدرسة بورسعيد الثانوية الصناعية، ومدرسة التحرير، ومدرسة العبور الصناعية الثانوية، ومدرسة العربي للتكنولوجيا التطبيقية) ومكاتبنا التعليمية المحلية (مديرية بورسعيد التعليمية، وإدارة شمال بورسعيد التعليمية، ومديرية القليوبية التعليمية، وإدارة العبور التعليمية) وشركاؤنا من المصانع (توشيبا العربي، ويونيشارم، وسوميتومو لأنظمة الأسلاك الكهربائية).

أخيرًا، أود أن أشكر كل واحد من مسؤولي وزارة التربية والتعليم والتعليم الفني وكذلك مستشاري المواد التعليمية الذين شاركوا في هذا الجهد معًا.

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## الهدف من دليل الإرشادات

يشير هذا الدليل الإرشادي إلى "المهارات الفنية والمهارات الشخصية التي يجب على الطلاب اكتسابها في أيام الدراسة" والتي يُطلق عليها "الجدارة". يهدف هذا الدليل الإرشادي إلى مساعدة مديري المدارس والمعلمين في المدارس الثانوية الفنية، وخاصة المدارس الثانوية الصناعية، على فهم الجدارات التي يجب أن يكتسبها الطلاب في أيامهم الدراسية ويوضح طرق تحسين الدروس العملية لتحقيق هذا الهدف.

## هيكل دليل الإرشادات والفئات المستهدفة

الهدف من هذا الدليل الإرشادي هو تحسين جودة الدروس العملية. ومع ذلك، فإن الفئات المستهدفة ليس فقط معلمي الدروس العملية، ولكن أيضاً جميع موظفي المدارس الثانوية الفنية والإدارة/ المديرية التعليمية التابعة لها. يتكون هذا الدليل الإرشادي من سبعة فصول. تستهدف الفصول الثاني والثالث والرابع معلمي الدروس العملية بينما تستهدف الفصول الأخرى جميع المعلمين. يجب قراءة الفصل السادس بصفة خاصة بالنسبة للموظفين المسؤولين عن وحدة الانتقال إلى سوق العمل WTU.

### جدول ملخص يوضح الفئات المستهدفة لكل فصل في هذا الدليل:

الفصل	المدرسة	الإدارة/ المديرية التعليمية
الفصل الأول	جميع العاملين بالمدرسة	جميع العاملين المعنيين بالمدارس الثانوية الفنية
الفصل الثاني	معلمو الدروس العملية	الموجهون
الفصل الثالث	معلمو الدروس العملية	الموجهون
الفصل الرابع	معلمو الدروس العملية	الموجهون
الفصل الخامس	جميع العاملين بالمدرسة	جميع العاملين المعنيين بالمدارس الثانوية الفنية
الفصل السادس	جميع العاملين بالمدرسة، (وخصوصاً وحدة الانتقال إلى سوق العمل WTU)	جميع العاملين المعنيين بالمدارس الثانوية الفنية
الفصل السابع	جميع العاملين بالمدرسة	جميع العاملين المعنيين بالمدارس الثانوية الفنية

## وصف رموز هذا الدليل

تم وضع الرموز التالية في دليل الإرشادات لتسهيل فهم القراء.

	<p><u>نصائح مهمة:</u></p> <p>يشير هذا الرمز إلى نصائح لتنفيذ الأنشطة الأساسية (المعلومات أو "المفاتيح" المفيدة للتنفيذ الناجح). تتيح لك هذه المعلومات والتقنيات تنفيذ الأنشطة الواردة في هذا الدليل بشكل فعال.</p>
	<p><u>العرض:</u></p> <p>يصف هذا الرمز المحتويات التي سيتم توصيلها إلى الطلاب وطرق التواصل والعرض لشرحها بوضوح لإجراء دروس عملية وفقاً لهذا الدليل.</p>
	<p><u>مثال:</u></p> <p>يوضح هذا الرمز مثلاً لما يمكنك القيام به وفقاً لحالة مدرستك / قسمك كأنشطة لهذا الدليل. في هذا الصدد، يجب على كل معلم تنفيذ الأنشطة مع تعديل المحتويات وفقاً لظروف كل مدرسة.</p>
	<p><u>التكلفة:</u></p> <p>يشير هذا الرمز إلى العناصر المستخدمة لتنفيذ الأنشطة الأساسية. وفي هذا الإطار، سيتمكن كل معلم من اكتساب فكرة عن التكلفة.</p>
	<p><u>متقدم:</u></p> <p>يشير هذا الرمز إلى الأنشطة التي يتعين القيام بها بعد تحقيق الأنشطة الأساسية.</p>
	<p><u>سجلات يتم الاحتفاظ بها:</u></p> <p>يشير هذا الرمز إلى السجلات (المستندات)، وما إلى ذلك التي يجب الاحتفاظ بها عند تنفيذ الأنشطة الأساسية.</p>
	<p><u>الأشخاص المعنيون وأدوار كل منهم:</u></p> <p>يشير هذا الرمز إلى الأشخاص والأدوار المرتبطة بتنفيذ الأنشطة الأساسية.</p>
	<p><u>التقييم بواسطة مدير المدرسة:</u></p> <p>يشير هذا الرمز إلى المحتويات التي يجب أن يفهمها مدير المدرسة المتعلقة بتنفيذ الأنشطة الأساسية. من المستحسن أن تقوم المديرية والإدارة التعليمية بالتحقق من هذا البند عند المتابعة.</p>

## الفصل ١: ما يتعلمه الطلاب في المدارس الثانوية الفنية

### ١-١ الجدارات الأربعة التي يجب على الطلاب اكتسابها

في المناهج الدراسية التقليدية للمدارس الثانوية الفنية، يتم تدريس "المعرفة" في الدروس النظرية ويتم تدريس "المهارات" في الدروس العملية، ومع ذلك، بالإضافة إلى تلك المعرفة والمهارات، يتعين على الطلاب أن يكتسبوا "احساسًا بالهدف والدافع للعمل بشكل مستقل".

في المصانع، لا تكفي المعرفة والمهارة وحدها لتكون مفيدة. على سبيل المثال، معرفة كيفية تشغيل آلة مثل آلة المثقاب لا تعني بالضرورة أن المنتج يستوفي الدقة المطلوبة من قبل العميل. تبحث المصانع عن مواهب لديها احساس بالهدف والدافع للقيام دائمًا بالعمل من أجل تلبية الدقة التي يطلبها العميل من خلال استخدام المعرفة والمهارات القائمة على المعرفة. الشخص الذي لديه هذه المعارف والمهارات، إلى جانب الاحساس بالهدف والدافع للتطبيق العملي باستخدام المعرفة والمهارات يسمى الشخص ذو الجدارة.

#### **الجدارة هي وجود مزيج من:**

- المعرفة
- المهارات القائمة على المعرفة
- الاحساس بالهدف والدافع للتطبيق العملي باستخدام المعرفة والمهارات من أجل تحقيق شيء ما.

على الرغم من وجود أنواع مختلفة من الجدارات، ينبغي أن تهدف المدارس الثانوية الفنية إلى تركيز التعليم بشكل أساسي على الجدارات الأربعة التالية التي تتطلبها المصانع وجعل الطلاب يكتسبونها من خلال الدروس العملية.

#### **أربع جدارات رئيسية:**

- PR: الإنتاج وفقًا للمواصفات.
- SB: السلوك الآمن.
- 3S: التصنيف / الترتيب / التنظيف.
- TM: إدارة الوقت

تندرج الجدارات التي يجب على الطالب اكتسابها كمهني محترف بشكل رئيسي تحت إطار "الإنتاج وفقًا للمواصفات". يمكن اعتبار العلاقة بين الجدارات الأربعة أن جدارة "الإنتاج وفقًا للمواصفات" تقع في المركز لضمان جودة العمل، بينما تعمل الجدارات الثلاثة الأخرى كعناصر لضمان الجودة وتعزيزها. وبالتالي، حتى مع ارتفاع مستوى جدارة "الإنتاج وفقًا للمواصفات"، لن يكون خريج التعميم الفني محل تقدير الصناعة بدون الجدارات الثلاثة الأخرى.

على سبيل المثال، قد يتسبب عامل مصنع يفشل في ممارسة السلوك الآمن في وقوع حادث خطير. حتى إذا كان الشخص يمتلك المعرفة والمهارات والدافع لممارسة السلوك الآمن، إذا تأخر هو أو هي عن حضور أحد الاجتماعات وفاتته مناقشة التدابير الوقائية، سيكون هناك خطر أكبر لوقوع حادث خطير. في حالة وقوع حادث خطير، فإن ذلك يعني تأثيرًا كبيرًا على الجودة ومواعيد التسليم.

وبالتالي، فإن الجدارات الأربعة تكمل بعضها البعض، والشخص الذي يفتقر إلى إتقان واحدة فقط منها غير مؤهل ليكون "فنيًا عالي الجودة". يجب على المعلمين زيادة وعي الطلاب بأهمية الجدارات الأربعة وطبيعتها المترابطة، وإجراء الدروس مع التركيز على تعزيز هذه الجدارات.

### **نتائج التعلم المتوقعة**

يجب على المعلمين إعطاء التوجيهات للطلاب بحيث يصبحوا قادرين على بلوغ مستويات الأداء التالية فيما يخص الجدارات الأربعة.

المستوى المتوقع (نتائج التعلم)	الجدارة
يقوم بشكل مستقل بأداء مراحل العمل الأساسية (مراجعة المتطلبات - القيام بالعمل - التأكد من النتائج) من أجل تصنيع المنتج وفقًا للمواصفات.	<b>الإنتاج وفقًا للمواصفات</b>
يقوم بشكل مستقل بأداء السلوك الآمن لضمان السلامة في مواقع العمل بالمصنع.	<b>السلوك الآمن</b>
يقوم بشكل مستقل بالتصنيف - الترتيب - التنظيف داخل الورشة لزيادة جودة المنتج والعمل بكفاءة.	<b>التصنيف / الترتيب / التنظيف</b>
يقوم بشكل مستقل بإدارة الوقت بالشكل المتوقع في المصنع.	<b>إدارة الوقت</b>

### **٢-١ الممارسة والتوجيهات المتكررة لتمكين الطلاب من اكتساب الجدارة**

يتم تدريس "المعرفة" و "المهارات" في المناهج الدراسية التقليدية. بالإضافة إلى ذلك، يعتبر "الاحساس بالهدف والدافع للتصرف بشكل مستقل" ضروريًا أيضًا. مع مزيج من هذه العناصر الثلاثة، فإن تمكين الطلاب من "الممارسة المتكررة" وإعطاء "توجيهات متكررة" يمكّن الطلاب من ترسيخ المعرفة والمهارات فيهم ويجعل الطلاب يكتسبون الجدارة. في هذا الدليل الإرشادي، سيتم شرح طرق تمكين الممارسة المتكررة للطلاب والتوجيهات المتكررة من قبل المعلمين بدءاً من الفصل الثاني.

### تعزيز الاحساس بالهدف:

من أجل تعزيز الاحساس بالهدف لدى الطلاب، من الضروري أن يشرح المعلمون للطلاب في الفصل مرارًا وتكرارًا أهمية الجدارة. وذلك لأن الإحساس بالهدف سوف ينمو عندما يفهم الطلاب بأنفسهم ويقدرّون الفوائد التي يمكنهم الاستمتاع بها من خلال اكتساب الجدارة. الطلاب الذين يرغبون في الذهاب إلى الكلية سيكونون جادين أيضًا في تعلم الجدارات بمجرد أن يجدوا أنهم سيحتاجون إلى هذه الجدارات حتى بعد التخرج من الكلية.

لإعطاء الطلاب تعليمات بشأن الجدارات، من الضروري أن يفهم المعلمون تمامًا الجدارات المطلوبة في الصناعة. لذلك، تحتاج المدارس إلى التعاون مع المصانع. سيتم مناقشة الشراكة مع المصانع في الفصل السادس.

### ٣-١ متى يتم تطبيق الممارسة المتكررة

يمكن تطبيق الممارسة المتكررة لجميع الجدارات في الدروس العملية. من ناحية أخرى، يمكن أيضًا ممارسة إدارة الوقت (الالتزام بالمواعيد) في الدروس غير العملية، وإذا أصبح "عدم الالتزام بالمواعيد الحصة" في الدروس غير العملية عادةً عند الطلاب، فلن يحضروا كذلك في الوقت المحدد للدروس العملية. ولهذا السبب، يجب تدريس إدارة الوقت طوال وجود الطلاب في المدرسة. يحتوي هذا الدليل على وصف منفصل لكل جدارة، وما يجب على المدرسة والمعلمين القيام به عند تطبيق هذا الدليل الإرشادي لأول مرة، وكيفية تطبيق الممارسة المتكررة (التوجيهات المتكررة) في الفصول من الثاني حتى الخامس.

### الجدول (١) متى يمكن تطبيق الممارسة المتكررة

الجدارة	القسم (١) الدروس العملية	القسم (٢) الدروس العامة	رقم الفصل في هذا الدليل
الإنتاج وفقًا للمواصفات	✓		الفصل الثاني
السلوك الآمن	✓		الفصل الثالث
التصنيف/ الترتيب/ التنظيف	✓		الفصل الرابع
إدارة الوقت	✓	✓	الفصل الخامس



## **٤-١ العلاقة مع المنهج الحالي**

يتم تنفيذ أساليب التدريس وفقاً لهذا الدليل بما يتماشى مع المناهج والكتب الدراسية الحالية. ومع ذلك، تشتمل الأساليب على المزيد من أنشطة القائمة على الممارسة المتكررة والتوجيهات المتكررة التي تهدف إلى تمكين الطلاب من اكتساب الجدارات الأربعة.

## **٥-١ بناء المسار الوظيفي**

من خلال تدريس الجدارات الأربعة، يجب على المدرسة أن توضح كيف يمكن للطلاب بناء حياتهم المهنية في المجتمع متزودين بهذه الجدارات. ومع ذلك، لا يعرض هذا الدليل كيفية بناء المسار الوظيفي. لذلك، يركز هذا الدليل على عقد المدرسة شراكات مع المصانع واستيعاب احتياجات المصانع للتأكد من فهم الطلاب لفائدة الجدارات الأربعة في الصناعات بعد التخرج من المدرسة.

## الفصل ٢: تطبيق الممارسة المتكررة للجدارة: الإنتاج وفقاً للمواصفات

### ١-٢ وصف الجدارة:

يقوم بشكل مستقل بأداء مراحل العمل الأساسية (مراجعة المتطلبات - القيام بالعمل - التأكد من النتائج) من أجل تصنيع المنتج وفقاً للمواصفات

#### **الشرح:**

تُعد "مراحل العمل الأساسية" (مراجعة المتطلبات، والقيام بالعمل، والتأكد من النتائج) ضرورية لإنتاج العمل الذي يتوافق مع المتطلبات. إن فهم المتطلبات (المواصفات) المحددة وصنع المنتجات على النحو المطلوب هي جدارة أساسية تتطلبها المصانع، والفني الذي لا يستطيع صنع المنتجات وفقاً للمتطلبات (المواصفات) قد يفقد وظيفته التي حصل عليها بصعوبة. يجب على المعلمين شرح ذلك حتى يتأكدوا من أن الطلاب يفهمون ويفقدون أهمية الجدارة ويمارسون مراحل العمل الأساسية.

<p>هناك دائماً متطلبات بالنسبة لأي عمل في المصانع. لذلك، يجب على من يقوم بالتصنيع أن يراجع المتطلبات أولاً.</p>	<p><b>المرحلة ١:</b> <b>مراجعة المتطلبات</b></p> 
<p>يتم تنفيذ العمل لتحقيق المتطلبات. من المتوقع أن يكون المهني المحترف قادرًا على تحديد الآلات/ المعدات والأدوات والمواد اللازمة للوفاء بالمتطلبات، لكن هذا لن يكون ممكناً لطالب المرحلة الثانوية الفنية. لذلك، يجب على المعلمين توفير الآلات/ المعدات والأدوات والمواد المناسبة للطلاب، مع شرح لماذا تم اختيارها للعمل. ما يتعلمه الطلاب هنا سيكون مفيداً في المستقبل، بعد تخرجهم واكتساب الخبرة في هذه الصناعة.</p>	<p><b>المرحلة ٢:</b> <b>القيام بالعمل</b></p> 
<p>بمجرد الانتهاء من العمل، تأكد من مراجعة نتائج العمل. في معظم الحالات، تتم المراجعة عن طريق القياس. إذا أظهرت القياسات أنه لم يتم استيفاء المتطلبات، يجب على الطالب العودة إلى العمل مرة أخرى. يتكرر العمل والمراجعة حتى تفي النتائج بالمتطلبات.</p>	<p><b>المرحلة ٣:</b> <b>التأكد من النتائج</b></p> 

تتضمن الدروس العملية التقليدية أيضاً توجيهات حول مراحل العمل الأساسية المذكورة. ومع ذلك، يتم التركيز في هذا الدليل على كيفية تدريب الطلاب على تكرار ممارسة مراحل العمل الأساسية.

## ٢-٢ التحضيرات اللازمة للتوجيهات

### (١) خطة الدروس العملية

يقوم المعلمون بمواءمة خطط الدروس العملية لتمكين الطلاب من القيام بمزيد من الممارسة المتكررة لمراحل العمل الرئيسية.

#### **نصائح مهمة لإعداد خطة الدرس العملي:**



تشكيل مجموعات صغيرة: لزيادة الممارسة المتكررة لمراحل العمل الأساسية، من الضروري إشراك المزيد من الطلاب في العمل لفترة أطول. لهذا السبب، يتم تقديم دروسًا عملية في مجموعات صغيرة. هذا يقلل من عدد الطلاب الذين يستخدمون المعدات/ الأدوات في نفس الوقت، مما يزيد من وقت استخدام الطالب المعدات/ الأدوات. فوجود عدد المعدات/ الأدوات أكثر من عدد الطلاب في المجموعة الواحدة، من الممكن التأكد من أن كل طالب لديه فرصة أكبر للقيام بممارسة متكررة لمراحل العمل الأساسية. يوصى بأن يكون عدد الطلاب في المجموعة الواحدة حوالي أربعة إلى عشرة طلاب، وهو العدد الذي يستطيع فيه المعلم مراقبة كل طالب. بمجرد تشكيل المجموعات، من المستحسن أن تستمر مع نفس المجموعة للعام بأكمله، وذلك لتجنب الالتباس. إلى جانب ذلك، يجب مراعاة ثلاثة ظروف معوقة عند تشكيل المجموعات: عدد المعدات، وعدد المعلمين، وموضوع الدرس العملي.

ترتيب الموضوعات: لا يمكن للطلاب فهم المفاهيم المعقدة عندما لا تتوافر لديهم المعرفة الأساسية أو المهارات الأساسية. من الناحية المثالية، يجب أن يتعلم الطلاب أولاً المعارف والمهارات الأساسية قبل الانتقال إلى الموضوعات المتقدمة.

المستوى الأكاديمي الأساسي للطلاب: المستوى الذي يمكن تحقيقه في الدروس العملية سيكون أعلى إذا كان لدى الطلاب فهم قوي للنظرية. يعتمد فهم النظرية على المستوى الأكاديمي الأساسي للطلاب. لذلك، يجب أن يكون لدى المعلمين فهم جيد للمستوى الأكاديمي الأساسي للطلاب قبل تدريس النظرية، واستخدامه لتحديد مدى صعوبة الدرس العملي (على سبيل المثال، عدد عناصر المقاومة المستخدمة في الدروس العملية للإلكترونيات) والوقت اللازم لكل درس عملي.

#### **التواصل مع الطلاب:**



يكون التعلم أكثر فاعلية عندما يفهم الطلاب الهدف من الدروس العملية لأنهم سيكونون قادرين على العمل في الدروس العملية مع الاحساس بالهدف. لذلك يجب على المعلمين إبلاغ خطة الدرس العملية للطلاب قبل بدء الدرس. يوصى بعرض الخطة على لوحة إعلانات ورشة العمل أو توزيعها على الطلاب.

فيما يلي أمثلة على خطط الدروس العملية لثلاثة أنواع من المدارس. مثال مدرسة التكنولوجيا التطبيقية هو الأكثر مرونة، وبالتالي فهي تتضمن خطة الدروس العملية الفعالة لتعلم الطلاب.

### **خطة الدروس العملية (مدرسة التكنولوجيا التطبيقية):**



عدد طلاب السنة الأولى قسم صيانة الآلات في الفصل الواحد هو ٣٢. كانت هناك ظروف مقيدة للمنهج على النحو التالي:

<b>المعدات:</b>	المعدات المتاحة في المدرسة هي: عدد ١٦ قدمة ذات الورنية، عدد ١ مثقاب، عدد ١ مخرطة، عدد ١ آلة لحام بالغاز، عدد ١ آلة لحام القوس، ٨ مبارد.
<b>عدد المعلمين:</b>	إجمالي ٤ معلمين. معلم يستطيع تعليم اللحام وثلاثة معلمين يستطيعون تعليم المهارات الأخرى.
<b>موضوع الدرس العملي</b>	في السنة الأولى، يتم شرح البرادة والتشطيب اليدوي، واستخدام المثقاب، واللحام.

تم إجراء مناقشة بحضور جميع معلمي الدروس العملية، واتفقوا على أنه يجب تقسيم الطلاب إلى أربع مجموعات تتكون كل مجموعة من ٨ طلاب وأن تكون خطة الدروس العملية على النحو التالي:

المجموعة الأولى	المجموعة الثانية	المجموعة الثالثة	المجموعة الرابعة
عرض خطة الدروس العملية، وإعلان المجموعات، وشرح الجدارات المطلوب اكتسابها.			
الأمن والسلامة		القياس	
القياس		الأمن والسلامة	
التشطيب اليدوي	آلة لحام القوس	مخرطة	آلة لحام بالغاز
آلة لحام بالغاز	التشطيب اليدوي	القوس	مخرطة
اختبارات، الخ			
مخرطة	آلة لحام بالغاز	التشطيب اليدوي	آلة لحام القوس
آلة لحام القوس	مخرطة	آلة لحام بالغاز	التشطيب اليدوي
اختبارات، الخ			

يتضمن الدرس العملي للتشطيب اليدوي والمخرطة إجراء قياسات. لذلك، تم تصميم الدرس ليضم موضوع القياسات قبل تنفيذ موضوعي التشطيب اليدوي والمخرطة. (ترتيب الموضوعات).

يتم شرح درس "الأمن والسلامة" في الأسبوع الأول، ولكن حتى إذا تم شرح سلوك السلامة لاستخدام الأدوات الميكانيكية (على سبيل المثال، المخرطة) في هذا الوقت، فلن يتمكن الطلاب من فهمه على الإطلاق. لذلك، من أجل تعزيز الوعي العام بالسلامة، يتضمن محتوى الدرس ما يلي: حالات الحوادث في المصنع، وشرح أهمية قواعد الزي، والتجول في المدرسة مع الطلاب للبحث معًا عن أماكن المخاطر المحتملة. (ترتيب الموضوعات، المستوى الأكاديمي الأساسي للطلاب).

تم تقديم هذه الخطة لطلاب السنة الأولى في الفصل الأول من العام الدراسي، وتم عرض الخطة أيضًا على حائط الورشة.



### **خطة الدروس العملية (مدرسة النظام العام):**

يتم تحديد موضوعات الدروس العملية الذي سيتم تدريسها في كل فصل دراسي مقدماً بواسطة وزارة التربية والتعليم والتعليم الفني في مدارس النظام العام. ومع ذلك، يُسمح لكل مدرسة بتعديلها وفقاً لظروفها.

عدد طلاب صيانة الآلات في السنة الأولى في الفصل الواحد هو ٢٤ طالب. كانت هناك ظروف مقيدة لتدريس المناهج على النحو التالي:

<b>المعدات:</b>	المعدات المتاحة في المدرسة هي: عدد ١٦ قدمة ذات الوردية، عدد ١٦ مبارد، عدد ٢ آلة لحام بالغاز، عدد ٢ آلة لحام القوس.
<b>عدد المعلمين:</b>	إجمالي ٤ معلمين. معلمان اثنان لتعليم اللحام ومعلمان اثنان لتعليم المهارات الأخرى.
<b>موضوع الدرس العملي</b>	في الفصل الدراسي الأول في السنة الأولى، يتم شرح التشطيب اليدوي واللحام.

تم إجراء مناقشة بحضور جميع معلمي الدروس العملية، واتفقوا على أنه يجب تقسيم الطلاب إلى ثلاث مجموعات تتكون كل مجموعة من ٨ طلاب وأن تكون خطة الدروس العملية على النحو التالي:

المجموعة الأولى	المجموعة الثانية	المجموعة الثالثة	
عرض خطة الدروس العملية، وإعلان المجموعات، وشرح الجدارات المطلوب اكتسابها وتوجيهات الأمن والسلامة.			<b>الأول الأسبوع</b>
آلة لحام بالغاز	القياس	القياس	<b>الأسبوع ٢ - ٤</b>
آلة لحام القوس	آلة لحام بالغاز	التشطيب اليدوي	<b>الأسبوع ٥ - ٧</b>
القياس	آلة لحام القوس	آلة لحام بالغاز	<b>الأسبوع ٨ - ١٠</b>
التشطيب اليدوي	التشطيب اليدوي	آلة لحام القوس	<b>الأسبوع ١١ - ١٣</b>
اختبارات			<b>الأسبوع ١٤ - ١٥</b>

يتضمن الدرس العملي للتشطيب اليدوي إجراء قياسات. لذلك، تم تصميم الدرس ليشمل موضوع القياسات قبل تنفيذ موضوع التشطيب اليدوي. (ترتيب الموضوعات).

يتم شرح درس "الأمن والسلامة" في الأسبوع الأول، ولكن حتى إذا تم شرح سلوك السلامة لاستخدام الأدوات الميكانيكية (على سبيل المثال، المخرطة) في هذا الوقت، فلن يتمكن الطلاب من فهمه على الإطلاق. لذلك، من أجل تعزيز الوعي العام بالسلامة، يتضمن محتوى الدرس ما يلي: حالات الحوادث في المصنع، وشرح أهمية قواعد الزي، والتجول في المدرسة مع الطلاب للبحث معًا عن أماكن المخاطر المحتملة. (ترتيب الموضوعات، المستوى الأكاديمي الأساسي للطلاب).

تم تقديم هذه الخطة لطلاب السنة الأولى في الفصل الأول من العام الدراسي. تم عرض الخطة أيضًا على جدار الورشة.



## **خطة الدروس العملية (مدرسة النظام المزدوج):**

يتم تحديد موضوعات الدروس العملية الذي سيتم تدريسها في كل فصل دراسي مقدّمًا بواسطة وزارة التربية والتعليم والتعليم الفني في مدارس النظام المزدوج. ومع ذلك، يُسمح لكل مدرسة بتعديلها وفقاً لظروفها.

في حالة المدارس المزدوجة، تكون مدة الدروس العملية في المدرسة أربعة أسابيع فقط، وهي مدة محدودة. وحتى في هذه الحالة، يمكن إجراء تعديلات كما هو موضح أدناه:

المجموعة الأولى	المجموعة الثانية	المجموعة الثالثة	
عرض خطة الدروس العملية، وإعلان المجموعات، وشرح الجدارات المطلوب اكتسابها وتوجيهات السلامة.			الأسبوع الأول
آلة لحام بالغاز	القياس	القياس	
آلة لحام القوس	آلة لحام بالغاز	التشطيب اليدوي	الأسبوع الثاني
القياس	آلة لحام القوس	آلة لحام بالغاز	الأسبوع الثالث
التشطيب اليدوي	التشطيب اليدوي	آلة لحام القوس	الأسبوع الرابع

يتضمن الدرس العملي للتشطيب اليدوي إجراء قياسات. لذلك، تم تصميم الدرس ليشمل موضوع القياسات قبل تنفيذ موضوع التشطيب اليدوي. (ترتيب الموضوعات).

يتم شرح درس "الأمن والسلامة" في الأسبوع الأول، ولكن حتى إذا تم شرح سلوك السلامة لاستخدام الأدوات الميكانيكية (على سبيل المثال، المخرطة) في هذا الوقت، فلن يتمكن الطلاب من فهمه على الإطلاق. لذلك، من أجل تعزيز الوعي العام بالسلامة، يتضمن محتوى الدرس ما يلي: حالات الحوادث في المصنع، وشرح أهمية قواعد الزي، والتجول في المدرسة مع الطلاب للبحث معًا عن أماكن المخاطر المحتملة. (ترتيب الموضوعات، المستوى الأكاديمي الأساسي للطلاب).

تم تقديم هذه الخطة لطلاب السنة الأولى في الفصل الأول من العام الدراسي، وتم عرض الخطة أيضًا على حائط الورشة.

## **التكلفة:**

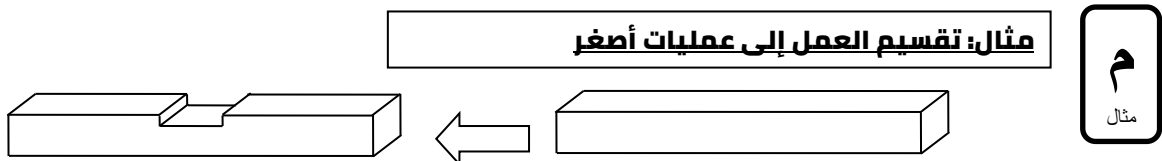
تكلفة مواد الدرس العملي: من خلال التقسيم إلى مجموعات صغيرة، يزداد الوقت الفعلي لاستخدام كل طالب للمعدات. لذلك، من الضروري توفير مواد خام أكثر للدروس العملية.





## (٢) تحسين خطة الدروس: تقسيم العمل إلى عمليات صغيرة لزيادة ممارسة مراحل العمل الأساسية

إذا كان كل عمل من البداية إلى النهاية يتم القيام به دفعة واحدة، فلن يكون من الممكن تكرار ومتابعة مراحل العمل الأساسية (مراجعة المتطلبات - القيام بالعمل - التأكد من النتائج). بدون المراجعة، قد تصبح طريقة العمل الخاطئة عادة. لهذا السبب، خاصةً بالنسبة إلى الموضوعات التي يتم تناولها لأول مرة، قم بتقسيم العمل إلى عمليات صغيرة. لاحظ أن تقسيم العمل إلى عمليات أصغر يُمكن المعلم من التحقق مما إذا كان الطلاب يقومون بالعمل بشكل صحيح و يراجعون (القياس) نتائج عملهم بشكل صحيح.



**مثال سيء لتدريس للمبتدئين: استخدم المبرد لإنتاج قطعة العمل على اليسار من المادة الخام على اليمين.**

**مثال جيد لتدريس للمبتدئين:**

**اتبع العمليات أدناه لإنتاج قطعة العمل.**

**العملية ١: برادة الأطراف.**

**عملية ٢: عمل الأخدود على السطح.**

**العملية ٣: تشطيب قطعة العمل.**

**بهذه الطريقة، يمكن زيادة الممارسة المتكررة لمراحل العمل الأساسية وممارستها (مراجعة المتطلبات - القيام بالعمل - التأكد من النتائج) في كل عملية من خلال زيادة العمليات بهذه الطريقة.**

### **نصائح مهمة لكيفية تحديد مدة العمليات:**

بمجرد أن يصبح الطلاب على دراية بالعمل، يبدأ عندهم شعور بالملل الشديد من العمليات الصغيرة. عندما يصبح الطلاب ماهرين في عملهم، يمكن إطالة مدة العمليات.

### **مثال لخطة درس:**

يوجد في الملحق أمثلة لتخصصي الإلكترونيات والميكانيكا.

### (٣) تطوير نظام لتمكين الطلاب من مراجعة نتائج عملهم بسهولة وبصفة متكررة

من أجل تمكين الطلاب من الممارسة المتكررة ومراجعة نتائج عملهم, يجب إنشاء نظام لمراجعة الحالة النموذجية في أي وقت أثناء العمل.

قم بعرض كتيبات الصور أدناه على طاولة العمل بحيث يمكن للطلاب مراجعة شكل "اللحم النموذجي" في جميع الأوقات.



#### **العرض:**



فيما يلي بعض الأمثلة:

- اعرض الصور في أماكن يمكن رؤيتها بسهولة.
- قم بتغليف المنشور واعرضه (بحيث يمكن استخدامه عدة مرات).
- اطبع ووزع المنشورات.
- قم بتوزيع الكتيبات (إذا كان المحتوى كبيراً).

#### **التكلفة:**



تكلفة الصور والتغليف والأوراق (تختلف التكلفة حسب طريقة العرض).

## ٣-٢ أساليب تدريس الممارسة المتكررة

إلى أن يكتسب الطلاب المعرفة والجدارات اللازمة، من الضروري أن يراجع المعلمون مرارًا وتكرارًا ما إذا كان الطلاب يتذكرون المعرفة وأنهم قد اكتسبوا المهارات. يتحقق المعلمون من مدى اكتساب المعرفة والمهارات في كل مرحلة مهمة. قم بالتأكد من حالة اكتساب المعرفة/ المهارة، وأخبر الطلاب أنهم اكتسبوا المعرفة والمهارات بشكل صحيح إذا كانوا قد اكتسبوها. إذا لم يكتسبوها، قم بتقديم إرشادات حول كيفية القيام بذلك بشكل صحيح. عند إعطاء الإرشادات، يكون من الفعال الإشارة إلى حالات نموذجية على الملصقات المجهزة وجعل الطلاب يقومون بالمراجعة من خلال النظر أو التلاوة أو ما إلى ذلك. كرر هذه العملية. يوضح الجدول التالي العملية.

الوقت	السلوك المستهدف للطلاب	كيف يقدم المعلمون توجيهاتهم للطلاب
في بداية الحصة	<p>(مراجعة المتطلبات): يفهم الطلاب النقاط التالية.</p> <p>✓ العمل بأكمله والعملية الخاصة بالدرس</p> <p>✓ الهدف من العمل</p> <p>✓ المتطلبات (المواصفات، مخططات الدائرة، إلخ).</p> <p>✓ النظرية الأساسية</p> <p>✓ أسماء ووظائف الآلات/ المعدات والأدوات</p> <p>بعد الشرح، يراجع المعلم فهم الطلاب للمتطلبات. إذا وجد أنهم يفهمون بشكل جيد، يخبرهم بأنهم يفهمون بشكل صحيح. إذا لم يكن الأمر كذلك، قم بتقديم الإرشادات بشكل متكرر حتى يتمكنوا من فهمها.</p>	<p>(مراجعة المتطلبات): يفهم الطلاب النقاط التالية.</p> <p>✓ العمل بأكمله والعملية الخاصة بالدرس</p> <p>✓ الهدف من العمل</p> <p>✓ المتطلبات (المواصفات، مخططات الدائرة، إلخ).</p> <p>✓ النظرية الأساسية</p> <p>✓ أسماء ووظائف الآلات/ المعدات والأدوات</p>

كيف يقدم المعلم توجيهاتهم للطلاب	السلوك المستهدف للطلاب	الوقت
<p>(القيام بالعمل): يتجول المعلم لمعرفة ما إذا كان الطلاب يعملون بشكل صحيح لتلبية المتطلبات. إذا كان الطلاب يعملون بشكل صحيح، يخبر المعلم الطلاب أن العمل تم بشكل صحيح. إذا لم يكن الأمر كذلك، يعطي المعلم توجيهاته بشكل متكرر حتى يتمكنوا من القيام بذلك.</p> <p>(التأكد من النتائج): يتجول المعلم لمعرفة ما إذا كان الطلاب يراجعون نتائج العمل بشكل صحيح. إذا تم مراجعة النتائج بشكل صحيح، يخبر المعلم الطلاب أنهم قاموا بذلك بشكل صحيح. كرر هذا حتى تفي نتائج العمل بالمتطلبات. إذا لم يكن الأمر كذلك، يشرح المعلم للطلاب بشكل متكرر حتى يتمكنوا من مراجعة النتائج بشكل صحيح.</p>	<p>(القيام بالعمل): يقوم الطلاب بالعمل لتحقيق المتطلبات.</p> <p>(التأكد من النتائج): يراجع الطلاب بشكل متكرر ما إذا كانت نتائج العمل الذي قاموا به تفي بالمتطلبات. بعد المراجعة، وفي حالة عدم تلبية المتطلبات، يعيد الطلاب مراجعة المتطلبات وأداء العمل.</p>	<p>أثناء الحصة</p>
<p>يشرح المعلم ملخص الدرس العملي اليوم. إذا كان هناك مثال على خطأ جسيم، يقوم المعلم بإيصاله إلى جميع الطلاب ويشجعهم على التفكير في سبب حدوث هذا الخطأ.</p>		<p>في نهاية الحصة</p>



## **نصائح مهمة للممارسة والتوجيهات المتكررة:**

يمكن اكتساب الجدارات من خلال ممارسة تكرارية بسيطة. ومع ذلك، هناك عدة أشياء يمكن إضافتها لمساعدة الطلاب على التعلم بشكل أفضل.

(١) تأكد من أن الطلاب لديهم احساس بالهدف: من أجل جعل الطلاب يكتسبون المعرفة والمهارات بكفاءة، يحتاج الطلاب إلى الاحساس بالهدف. لذلك، يجب شرح ضرورة كل جدارة مرارًا وتكرارًا في بداية الدرس العملي.

(٢) اطلب من الطلاب مراجعة تصرفاتهم: إن جعل الطلاب أنفسهم يدركون ويراجعون ما إذا كانوا يتخذون إجراءات صحيحة يساعد أيضًا في تحويل الإجراءات الصحيحة إلى عادة. خلال الدروس العملية، يُنصح أن يقوم الطلاب كل على حدة بمراجعة تصرفاتهم، والتفكير مع جميع الطلاب في نهاية الدرس العملي من خلال عرض أمثلة على السلوكيات الخاطئة الموجودة أثناء الدروس.

(٣) يكون المعلم نموذجًا يحتذى به بالنسبة للطلاب: يعد المعلم نموذجًا يحتذى به بالنسبة للطلاب. إذا لم يمارس المعلم الإجراءات الصحيحة، فسوف يتبعه الطلاب. إذا كان الطلاب لا يتخذون إجراءات صحيحة، فسوف يبدو الأمر كما لو أن المدرسة تؤكد أن معلمها لا يتخذون الإجراءات الصحيحة. يجب أن يكون المعلمون دائمًا على وعي بأن الطلاب يشاهدونهم، ويعيدوا التفكير في كيفية أدائهم وتحسينه باستمرار.

(٤) يجب أن يكون لدى المدرسين فهم مشترك للتوجيهات: سوف يرتبك الطلاب إذا لم يشترك المعلمون في نفس الفهم وقدموا إرشادات مختلفة. من الضروري للمعلمين عقد اجتماعات منتظمة لموظفي المدرسة واجتماعات القسم لضمان وجود فهم مشترك للتوجيهات.

## **التكلفة:**

لا توجد تكلفة إضافية (على الرغم من أنه قد تكون هناك تكلفة إضافية خلال عملية التحضير، لا تتضمن التوجيهات المتكررة أية تكلفة إضافية).



## **مستوى متقدم من التوجيهات المتكررة:**

يتم نسيان الجدارة إذا لم يتم استخدامها. بصفة خاصة، بعد إجازة مدرسية طويلة، هناك احتمال كبير أن ينسى الطلاب الجدارات التي اكتسبوها. ربما يكون من الجيد تقسيم العمليات الكبيرة إلى عمليات أصغر مرة أخرى بعد الإجازة المدرسية الطويلة لمراجعة مدى تذكر الطلاب لكل عملية قبل الانتقال إلى عملية أخرى.



## الفصل ٣: تطبيق الممارسة المتكررة للجدارة (٢) SB: السلوك الآمن

### ١-٣ وصف الجدارة:

يقوم بشكل مستقل بأداء السلوك الآمن لضمان السلامة في مواقع العمل بالمصنع.

#### الشرح:

من أجل الحفاظ على السلامة في موقع الإنتاج في المصنع، من الضروري فهم معايير السلامة وممارستها. هناك العديد من المخاطر في موقع إنتاج المصنع. يجب على العمال ضمان السلامة ليس فقط لأنفسهم ولكن أيضًا للعمال الآخرين من خلال إدراك المخاطر واتخاذ الإجراءات وفقًا لمعايير السلامة. تؤثر السلامة أيضًا بشكل كبير على كفاءة أنشطة الإنتاج في المصنع. يجب على المعلمين شرح هذا الأمر جيدًا للتأكد من أن الطلاب يفهمون ويقدرون أهمية السلوك الآمن وممارسته.

إن ضمان الأمن والسلامة في ورش العمل في كل قسم يتضمن العناصر الثلاثة التالية: قواعد زي الورشة، والسلوك الآمن، وبيئة العمل.

قواعد زي الورشة	يمكن تقليل خطر الحوادث من خلال ارتداء الملابس والأدوات الواقية المناسبة للعمل بشكل صحيح. إن اتباع لقواعد الزي أمر أساسي للعمل بأمان.
السلوك الآمن	يمكن تقليل خطر الحوادث من خلال اتباع لمعايير السلوك الآمن الأساسية (مراحل العمل) لتنفيذ العمل، وكذلك المعايير الخاصة بعمل معين. يتضمن ذلك الإجراءات الواجب اتخاذها من أجل السلامة، وما لا يجب القيام به، وكيفية التعامل مع الحوادث عند وقوعها.
بيئة العمل	تؤثر بيئة العمل مثل مساحة مكان العمل، والممرات الجانبية، وترتيب الأشياء بشكل كبير على سلامة العمال. لذلك، من الضروري تصميم بيئة عمل تراعي معايير السلامة. بالإضافة إلى ذلك، يعبر التصنيف والترتيب والتنظيف في بيئة العمل أمراً ضرورياً للحفاظ على بيئة العمل الآمنة. (سيتم مناقشة التصنيف والترتيب والتنظيف في الفصل ٤)

عادةً، يتم تدريس موضوعات الأمن والسلامة الموضحة في الكتب الدراسية في بداية الدروس العملية. يقدم هذا الدليل الإرشادي أساليب التدريس للممارسة المتكررة لجعل السلوك الآمن عادةً بشكل منفصل عن درس الأمن والسلامة.

## ٢-٣ التحضيرات اللازمة للتوجيهات:

### (١) إعداد وعرض القواعد الأساسية لزي الورشة

قم بإعداد وعرض قواعد زي الورشة الأساسية التي يجب على الطلاب الالتزام بها أثناء الدروس العملية. بصفة أساسية، لا يمكن أن يكون هناك استثناءات. يؤدي وضع معيار لا يمكن تطبيقه إلى عدم الالتزام به، مما يتسبب في خلق انطباع خاطئ لدى الطلاب بأنه لا يلزم اتباع المعايير. لهذا السبب، يجب أن يكون المعيار قابلاً للتحقيق مع إعطاء الأولوية للأمن والسلامة.

#### **نصائح مهمة لإعداد قواعد زي الورشة:**



التكلفة: يوصى بأن تشتري المدرسة ملابس العمل والخوذات والأحذية والأدوات الواقية وأن توزعها على الطلاب، ولكن إذا لم يكن ذلك ممكنًا، قم بإعداد نظام للزي يمكن إتباعه بالملابس التي يمتلكها الطلاب بالفعل أو التي يمكن شراؤها بسهولة.

الدين: قد يعلق الحجاب أو النقاب في الآلات. فكر في طريقة لضمان السلامة أثناء العمل مع احترام دين الطلاب وثقافتهم أيضًا.

#### **العرض:**



لجعل الطلاب يتدربوا مرارًا وتكرارًا، من المفيد عرض أمثلة نموذجية يمكن للطلاب الرجوع إليها بسرعة. للاطلاع السريع، ينبغي الإشارة إلى النقاط التالية:

- اعرضها في مكان مرئي في ورشة العمل.
- استخدم نصًا بحروف أكبر وألوانًا سهلة الرؤية.
- اشرح بوضوح وبشكل خاص باستخدام الرسوم البيانية والصور.

#### **التكلفة:**



الأوراق (لعمل الملصقات).

## مثال لملصق يوضح المعايير الأساسية لزي الورشة:



## قم بإعداد معايير للزي الخاص بعمل معين:



قد لا تكون معايير الزي الأساسية كافية لبعض الآلات/ المعدات. على سبيل المثال، يتطلب العمل باستخدام آلة لحام معدات واقية (نظارات واقية لحماية العينين، ومآزر وأكمام واقية من اللهب). من الأفضل وضع قواعد الزي الخاصة بمعدات معينة حسب الحاجة.





## (٢) إعداد وعرض المعايير العامة للسلوك الآمن

لتجنب الحوادث أثناء الدروس العملية، يجب على المعلمين إعداد وعرض المعايير العامة للسلوك الآمن التي يجب على الطلاب اتباعها.

### أمثلة لمعايير السلوك الآمن:



- أ) يجب على الطلاب دائماً الحفاظ على صحتهم الجسدية بأنفسهم، وإبلاغ المعلم إذا شعروا أنهم ليسوا بخير.
- ب) دائماً ضع السلامة والعمل بأمان أولاً وقبل أي شيء آخر.
- ج) قبل البدء في استخدام الآلات/ المعدات، تحقق مما إذا كانت آمنة للاستخدام.
- د) لا تبدأ العمل قبل أن يعطي المعلم التعليمات.
- هـ) اطلب الإذن من المعلم عند الابتعاد عن العمل.
- و) قم بالتصنيف داخل المنطقة المحددة.
- ز) أبلغ المعلم إذا تم العثور على أي مشاكل مع العناصر المستخدمة خلال الدروس العملية (الآلات/ المعدات، والأدوات، وقطع الغيار).
- ح) في حالة وقوع حادث، أبلغ المعلم على الفور.

### العرض:



من المفيد عرض المعايير بحيث يمكن للطلاب الرجوع إليها على الفور أثناء القيام بالممارسة المتكررة. يُرجي ملاحظة النقاط التالية:

- اعرضها في مكان مرئي في ورشة العمل.
- استخدم حروفاً أكبر وألواناً سهلة الرؤية.
- اشرح بوضوح وبشكل خاص باستخدام الرسوم البيانية والصور.

### التكلفة:



الأوراق (لعمل الملصقات).



### إنشاء معايير خاصة بعمل معين للسلوك الآمن:



قد لا تكون المعايير الأساسية للسلوك الآمن كافية لبعض الآلات/ المعدات. لذلك، من الأفضل وضع معايير محددة للسلوك الآمن لمعدات معينة حسب الحاجة.

### (٣) إنشاء بيئة عمل قياسية

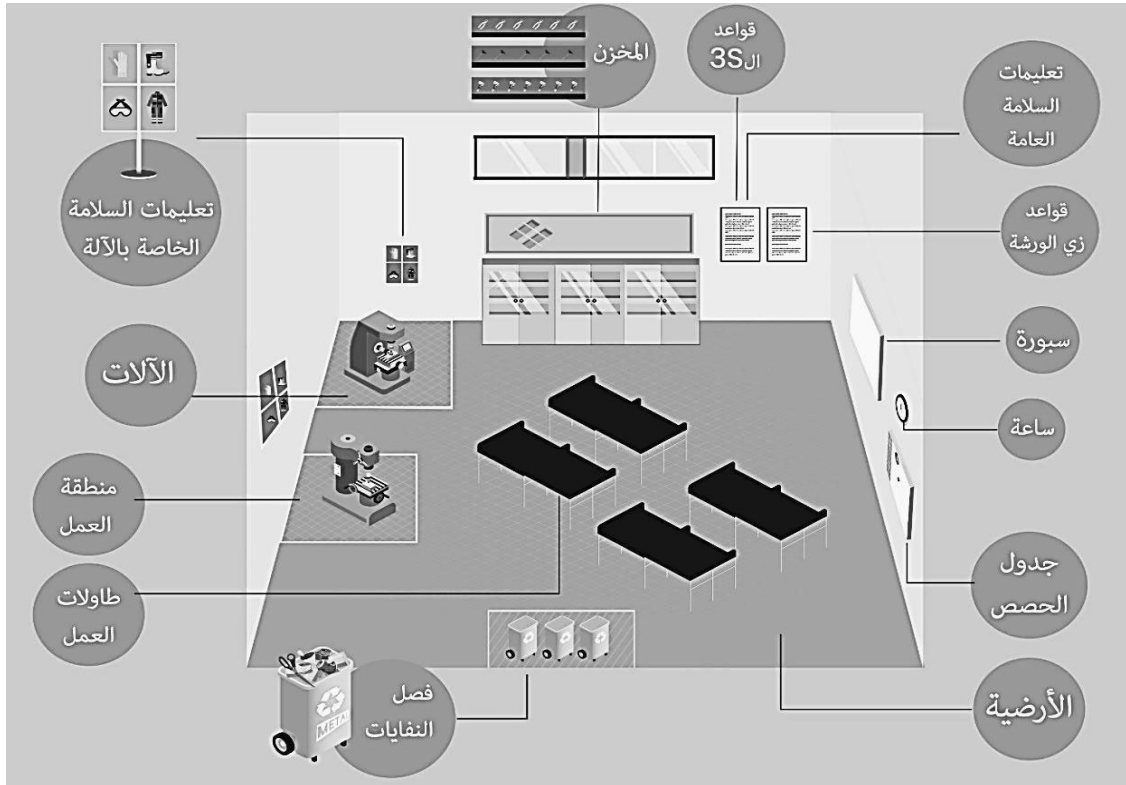
تصميم مساحة العمل، والممرات الجانبية، وترتيب الأغراض مع أخذ السلامة في الاعتبار.

#### أمثلة لتصميم بيئة العمل:



- حدد منطقة العمل بخطوط أو ملصقات لتسهيل التعرف على مكانها.
- حافظ على مساحة كافية للعمل على المعدات لمنع إصابة الطلاب أثناء العمل.
- قم بتثبيت الأغراض في الأماكن التي لا تتداخل مع العمل (الأرفف، وصناديق القمامة، وما إلى ذلك).

#### مثال لملصق يوضح تصميم بيئة العمل:



<p>- منطقة العمل موضحة بعلامات بخطوط أو علامات. - توجد مسافة كافية بين الآلات. - العناصر موضوعة في أماكن لا تتداخل مع منطقة العمل. - لا يوجد عوائق في الممرات.</p>	<p>منطقة العمل</p>
<p>- تم تعليق ملصقات معايير زي الورشة. - تم تعليق ملصقات السلامة العامة.</p>	<p>ملصقات الأمن والسلامة العامة</p>
<p>- تم تعليق ملصقات السلامة الخاصة بعمل معين بجانب الآلة.</p>	<p>ملصقات الأمن والسلامة الخاصة بعمل معين</p>

## **التكلفة:**



صناديق القمامة, شريط لاصق ملون, الخ.

### ٣-٣ أساليب التدريس للممارسة المتكررة

بغض النظر عن مقدار معرفتك بإجراءات الأمن والسلامة، فإنها لا معنى لها إلا إذا كان بإمكانك العمل بأمان بالفعل. يجب على المعلمين دائمًا التحقق مما إذا كان الطلاب يمارسون السلوك الآمن. إذا لم يكن الطلاب يمارسون السلوك الآمن، قم بتصحيحه على الفور، وسيكون بإمكانهم عندئذ اكتساب عادة السلوك الآمن. عند إعطاء الإرشادات، من المفيد تشجيع الطلاب على الانتباه لمعايير السلامة من خلال الإشارة إلى الملصقات المعدة للمعايير.

يتم تكرار الممارسة مرارًا وتكرارًا في كل درس عملي، في بداية الدرس العملي وأثناءه وفي نهايته كما يلي.

الوقت	السلوك المستهدف للطلاب	كيف يقوم المعلمون بتقديم التوجيهات
في بداية الحصة	<ul style="list-style-type: none"> <li>✓ يتبع الطلاب قواعد زي الورشة عند حضور الدرس.</li> <li>✓ يراجع الطلاب القواعد العامة للسلامة.</li> <li>✓ يفهم الطلاب النقاط الأساسية للدرس العملي فيما يتعلق بالسلامة.</li> </ul>	<ul style="list-style-type: none"> <li>✓ يراجع المعلم ما يرتديه الطلاب. إذا كان هناك أي طالب لا يلتزم بقواعد الزي في الدرس العملي، يجب توجيهه في الحال.</li> <li>✓ يجعل المعلم الطلاب يراجعون معايير السلامة (اجعل الطلاب يراجعون ويقرأون معايير السلامة المكتوبة على الملصقات بصوت مسموع).</li> <li>✓ يشرح المعلم النقاط الرئيسية في الدرس فيما يتعلق بالسلامة خاصة عند استخدام آلات/ معدات أو أدوات جديدة، يجب على المعلم عرض كيفية استخدامها بأمان. يشرح المعلم بصفة خاصة كيفية العمل بأمان وما لا يجب القيام به.</li> <li>✓ يوجه المعلم الطلاب إلى قراءة النقاط الهامة معًا بصوت مسموع لزيادة الوعي حول السلامة.</li> </ul>
أثناء الحصة	<ul style="list-style-type: none"> <li>✓ يتصرف الطلاب بطريقة تتفق مع القواعد العامة للسلوك الآمن.</li> </ul>	<ul style="list-style-type: none"> <li>✓ يتجول المعلم في الورشة للتحقق من عدم قيام أي شخص بالعمل بطريقة غير آمنة.</li> <li>✓ إذا كان هناك طالب يقوم بعمل بطريقة غير آمنة، ينبغي إبلاغ الطالب ذلك وتوضيح كيفية العمل بشكل صحيح.</li> </ul>
في نهاية الحصة	<ul style="list-style-type: none"> <li>✓ يقوم الطلاب بمراجعة العمل الذي تم في الدرس بتوجيه من المعلم.</li> </ul>	<ul style="list-style-type: none"> <li>✓ يشرح المعلم ما هو السلوك غير الآمن الذي تمت ملاحظته أثناء الدرس ويوجه جميع الطلاب إلى التفكير "لماذا يعتبر هذا السلوك غير آمن؟". ثم يقدم المعلم إجابة نموذجية على هذا السؤال والسبب في ذلك.</li> </ul>



## **نصائح مهمة للممارسة والتوجيهات المتكررة**

يمكن اكتساب الجدارات من خلال الممارسة المتكررة البسيطة. ومع ذلك، هناك بعض الأشياء التي يمكن إضافتها لمساعدة الطلاب على التعلم بشكل أكثر كفاءة.

(١) تأكد من أن الطلاب لديهم احساس بالهدف: من أجل جعل الطلاب يكتسبون المعرفة والمهارات بكفاءة، يحتاج الطلاب إلى الاحساس بالهدف. لذلك، يجب شرح ضرورة كل جدارة مرارًا وتكرارًا في بداية الدرس العملي.

(٢) اطلب من الطلاب مراجعة تصرفاتهم: إن جعل الطلاب بأنفسهم يدركون ويراجعون ما إذا كانوا يتخذون إجراءات صحيحة يساعد أيضًا في تحويل الإجراءات الصحيحة إلى عادة. خلال الدروس العملية، يُنصح الطلاب كل على حدة بمراجعة تصرفاتهم والتفكير مع جميع الطلاب في نهاية الدرس العملي من خلال عرض أمثلة على السلوكيات الخاطئة الموجودة أثناء الدروس.

(٣) يكون المعلم نموذجًا يحتذى به بالنسبة للطلاب: يعد المعلم نموذجًا يحتذى به بالنسبة للطلاب. إذا لم يمارس المعلم السلوكيات الآمنة الصحيحة، فسوف يتبعه الطلاب. إذا كان الطلاب لا يتخذون إجراءات صحيحة، فسوف يبدو الأمر كما لو أن المدرسة تؤكد أن معلمها لا يتخذون الإجراءات الصحيحة. يجب أن يكون المعلمون دائمًا على وعي بأن الطلاب يشاهدونهم، ويعيدوا التفكير في كيفية أدائهم واتخاذ إجراءات للتحسين المستمر.

(٤) يجب أن يكون لدى المدرسين فهم مشترك للتعليمات: سوف يرتبك الطلاب إذا لم يشترك المعلمون في نفس الفهم وقاموا بتقديم إرشادات مختلفة. من الضروري للمعلمين عقد اجتماعات منتظمة لموظفي المدرسة واجتماعات القسم لضمان وجود فهم مشترك للتعليمات.

## **التكلفة:**



لا توجد تكلفة إضافية (بينما قد تكون هناك تكلفة خلال عملية التحضير، إلا أن التوجيهات المتكررة نفسها لا تتضمن أية تكلفة إضافية).

## **مستوى متقدم من التوجيهات المتكررة**



متقدم

سوف يتم نسيان الجدارة إذا لم تستخدم. على وجه الخصوص، بعد فترات الإجازة الطويلة في المدرسة، من المحتمل جدًا أن يكون الطلاب قد نسوا المعارف والمهارات التي تعلموها. حتى بالنسبة للمواضيع المتعلقة بالسلامة التي تمت تغطيتها من قبل، فمن الأفضل إعادة التحقق من مقدار ما يتذكره الطلاب بعد الانقطاع عن المدرسة لفترة طويلة.

## **تعزير الاستقلالية لدى الطلاب:**

عندما يعتاد الطلاب على هذه الجدارة، اطلب من الطلاب التحقق من قواعد الزي ومعايير السلامة بأنفسهم. هذا يلهمهم شعور بالمسؤولية ويشجع العمل المستقل. يجب أن يبدأ هذا مع الطلاب في السنة الثانية أو الصف الأعلى لأن الطلاب يكونون قد اكتسبوا بالفعل المعرفة العامة.



## **الفصل ٤: تنفيذ الممارسة المتكررة لـ 3S (٣): التصنيف/ الترتيب/ التنظيف**

### **٤-١ وصف الجدارة:**

يقوم بشكل مستقل بالتصنيف – الترتيب – التنظيف داخل الورشة وهي الأنشطة اليومية لـ (5S) لزيادة جودة المنتج والعمل بكفاءة.

### **الشرح:**

يمكن الحفاظ على بيئة عمل فعالة من خلال ممارسة التصنيف/ الترتيب/ التنظيف. ينبع مصطلح التصنيف/ الترتيب/ التنظيف من شعار (5S) المطبق في المصانع اليابانية. تمثل (5S) الأحرف الأولى من خمس كلمات رئيسية: التصنيف، والترتيب، والتنظيف، والتنميط، والتثبيت. يُستخدم شعار (5S) لصيانة مواقع العمل وتحسينها مثل: قطاعات التصنيع والخدمات، وغيرها، حيث تعتبر فعالة لزيادة كفاءة الوقت والمساحة. لهذا السبب، فإن اكتساب خبرة في (5S) ستكون ميزة لطلاب المدارس الثانوية الفنية الذين سيتم تعيينهم للعمل في المصانع بعد التخرج. لا يتعلق مفهوم (5S) بالجدارة فحسب، ولكنه يرتبط ارتباطًا وثيقًا بالسلامة والجودة. يجب على المعلمين شرح ذلك للتأكد من أن الطلاب يفهمون ويقدرّون أهمية مفهوم التصنيف/ الترتيب/ التنظيف ويمارسونه.

### **وصف عناصر شعار (5S)**

التصنيف	إزالة العناصر غير الضرورية: احتفظ فقط بالعناصر الضرورية للعمل وأبعد أو تخلص من جميع العناصر غير الضرورية، وبذلك يمكن استرجاع العناصر الضرورية على الفور، مما يزيد من كفاءة العمل.
الترتيب	قم بترتيب العناصر بحيث يسهل استخدامها مع وضع العلامات عليها: حدد مكان تخزين المواد والأدوات وتأكد من وضعها دائمًا هناك. هذا يقلل من وقت البحث عن العناصر، مما يزيد من كفاءة العمل.
التنظيف	التنظيف والفحص: نظف ورشة العمل والآلات. هذا يجعل من الممكن ملاحظة أية مشكلات، مثل تسرب الزيت من الآلات، وبالتالي زيادة كفاءة الإنتاج والسلامة.
التنميط	الحفاظ على (توحيد) ممارسة التصنيف/ الترتيب/ التنظيف: تأكد من أن الأنشطة الثلاثة المذكورة أعلاه (3S) يتم ممارستها. ضع قواعد موحدة للحفاظ على الورشة والآلات دائمًا مرتبة ونظيفة. اعرض القواعد الموحدة بحيث يمكن للجميع رؤيتها.
التثبيت	التدريب لتشكيل العادات: استمر في تدريب العاملين على القواعد الموحدة بحيث يتم الحفاظ على ممارسة التصنيف، الترتيب، التنظيف.

التصنيف/ الترتيب/ التنظيف هي أنشطة يومية تُسمى (3S). في المصانع، يُفترض على جميع الموظفين المساهمة في (التنميط) و(التثبيت). ولكن، هذا ليس هو الوضع بالنسبة للمدارس. في المدارس، يقوم المعلمون بوضع إطار العمل (التنميط) وتدريب الطلاب (التثبيت)، ويمارس الطلاب الـ (3S). هذا يعني أن المعلمين يجب عليهم إتقان عناصر (5S) جميعها. لا يذكر كتاب الدراسي للدروس العملية نظام التصنيف / الترتيب/ التنظيف. لهذا السبب، يجب أن يقوم المعلمون بوضع القواعد ومن الضروري أن يقوم الطلاب بأداء الممارسة المتكررة للـ(3S).



## ٢-٤ التحضيرات اللازمة للتوجيهات

### (١) يمارس المعلمون أنفسهم (التصنيف/ الترتيب/ التنظيف) في ورشة العمل

يمارس المعلمون أنفسهم التصنيف/ الترتيب/ التنظيف داخل ورشة العمل ويقومون بالتحضيرات اللازمة لجعل الطلاب يقومون بالممارسة المتكررة للتصنيف/ الترتيب/ التنظيف. يوضح القسم التالي كيف يتم ذلك بشكل عام. قم بالتعديل حسب الضرورة لتناسب الوضع في ورشة العمل.



#### ● التصنيف:



#### - الأدوات/ المواد الخ.

- يتفق جميع معلمي الدروس العملية على نوع العلامات التي تحدد العناصر غير الضرورية. يجب أن تكون العلامات غير مكلفة، مثل الشرائط الملونة، بمجرد الانتهاء من وضع العلامات، تخلص من هذه المواد.

#### ● الترتيب:



#### - الأدوات/ المواد الخ.

- قم بتصنيف نوع المواد وحدد أين ستضع كل منها.
  - قم بوضع العلامات في مكان التخزين كما هو مقرر، وضع المواد هناك. (إعداد القواعد المنظمة)
- #### - تصنيف المخلفات
- حدد كيف يمكن تصنيف المخلفات.
  - قم ب تثبيت صناديق القمامة بناءً على طريقة التصنيف المحددة.
  - ضع العلامات على صناديق القمامة لتوضح نوع القمامة التي يمكن وضعها فيها.

#### ● التنظيف:



#### - الأرضيات

- قم بكنس الأرضية. إذا لزم الأمر لأغراض الصحة، قم أيضاً بمسح الأرضية.

#### - طاولة العمل

- قم بمسح طاولة العمل.

#### - المعدات والآلات

- قم بتنظيف كل معدة تنظيفاً شاملاً. قم بإصلاح أي عطل موجود، مثل تسرب الزيوت. تأكد من أن المعدات جاهزة للعمل في أي وقت.

## (٢) إعداد وعرض قواعد التصنيف/ الترتيب/ التنظيف (التنميط)

قم بإعداد وعرض قواعد التصنيف/ الترتيب/ التنظيف التي يجب على الطلاب إتباعها.

### **القواعد التي يجب وضعها:**



بصفة عامة، يجب أن تتضمن هذه القواعد ما يلي، ولكن يمكن تعديلها حسب الضرورة لتلائم الوضع في ورشة العمل.

- قاعدة عامة تنص على أن طاولة العمل يجب أن تظل منظمة ونظيفة.
- قواعد لتصنيف المخلفات.
- قواعد للتنظيف.
- كيفية تنظيف المعدات/ الآلات (فقط للمعدات التي يقوم الطلاب بتنظيفها).

### **العرض:**



من المفيد عرض القواعد في مكان ظاهر حتى يتمكن الطلاب من الرجوع إليها فوراً أثناء الممارسة التكرارية مرةً بعد أخرى. يجب مراعاة النقاط التالية:

- اعرضها في مكان ظاهر في ورشة العمل.
- استخدم حروفاً كبيرة وألواناً سهلة.
- اشرح القواعد بوضوح وتفصيل باستخدام الرسوم التوضيحية والصور.

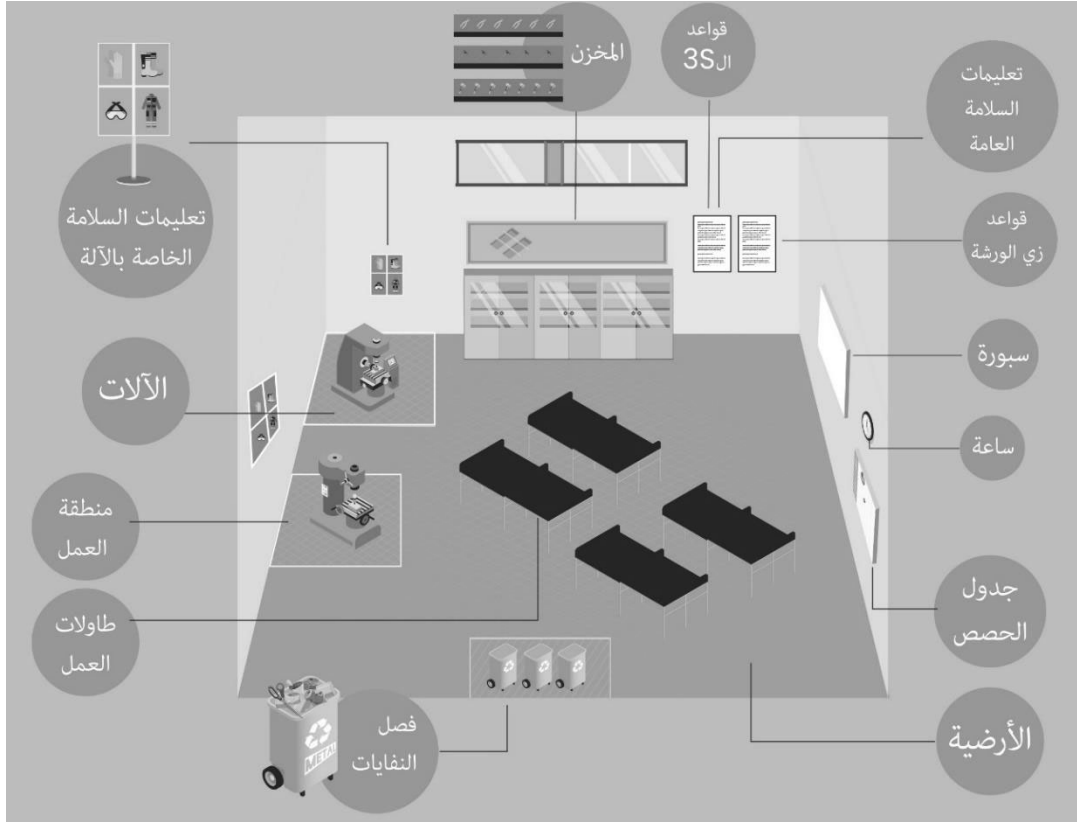
### **التكلفة:**



- الأوراق (لعمل الملصقات).
- مكان التخزين، وصناديق القمامة (من الممكن استخدام الأغراض الموجودة بأفكار جديدة).

## مثال لتطبيق الـ (5S) داخل الورشة:

م  
مثال



<ul style="list-style-type: none"> <li>- لا توجد عناصر غير ضرورية.</li> <li>- الأدوات نظيفة.</li> <li>- الأدوات والخامات مرتبة حسب العنصر.</li> <li>- تم لصق بطاقات توضح محتويات الأدرج.</li> </ul>		المخزن
<ul style="list-style-type: none"> <li>- تم تحديد قواعد تصنيف النفايات.</li> <li>- صناديق النفايات موضوعة وفقاً لقواعد التصنيف.</li> <li>- تم لصق بطاقات توضح نوع المهملات داخل الصندوق.</li> </ul>		فصل النفايات
<ul style="list-style-type: none"> <li>- تم كنس ومسح الأرضية.</li> </ul>		الأرضية
<ul style="list-style-type: none"> <li>- تم تنظيف طاولات العمل.</li> </ul>		طاولات العمل
<ul style="list-style-type: none"> <li>- تم تعليق قواعد الـ 3S</li> </ul>		قواعد الـ 3S
<ul style="list-style-type: none"> <li>- تم تنظيف الآلات وصيانتها وتجهيزها للعمل.</li> </ul>		الآلات

## **التحسينات السنوية:**

يناقش المعلمون ما إذا كان هناك أي مشكلة فيما يتعلق بتصنيف النفايات أو تخزين/إدارة الآلات والمعدات, أو ما إذا كانت هناك أي صعوبات في فهم التعليمات, وإجراء التحسينات حسب الضرورة.



### (٣) عقد تدريبات أولية للطلاب (التثبيت)

غالبًا لا يتم تدريس الطلاب عن التصنيف/ الترتيب/ التنظيم. بالإضافة إلى ذلك، لا يوجد أي ذكر لها في كتاب الدروس العملية. لذلك، يجب شرح ضرورة التصنيف/ الترتيب/ التنظيم وقواعده للطلاب قبل تنفيذه في الدروس العملية. (التدريبات الأولية).

#### استخدام أدوات تدريس التصنيف/ الترتيب/ التنظيم

حيث أن الكتاب المدرسي لم يتضمن أي وصف للتصنيف/ الترتيب/ التنظيم، قد يكون من المفيد استخدام رسومات أو صور مشابهة لها يلي لجعل الطلاب يفكرون ولتعزيز فهمهم.



يوضح الرسم التخطيطي التالي ثلاث ورش عمل: أ - ب - ج. حدد أي ورشة عمل الأكثر سهولة في العمل، وما الذي جعلك تعتقد ذلك.

ج - بعد الترتيب

العلامة: ■

■ ■  
■ ■ ■

العلامة: ▲

▲ ▲  
▲ ▲

تم ترتيب العناصر بطريقة مناسبة، ووضع العلامات في مكان التخزين

ب - بعد التصنيف

■ ■ ▲  
▲ ■

■ ▲ ▲  
■

التخلص من العناصر غير الضرورية

تخلص من: ● ● ● ●

أ - الحالة الأصلية

■ ■ ▲  
● ▲ ● ■

■ ▲ ▲  
● ● ■

عناصر غير ضرورية

## ٣-٤ أساليب التدريس للممارسة المتكررة

من أجل تحويل التصنيف/ الترتيب/ التنظيف إلى عادة، لا بد من التدريب المستمر. بعد عرض الصورة كاملة في التدريبات الأولية، كرر الممارسة لجعل التصنيف/ الترتيب/ التنظيف عادة في الدروس العملية. يجب على المعلمين أن يراجعوا بصفة عامة ما إذا كان الطلاب يمارسون التصنيف/ الترتيب/ التنظيف. إذا كان الطلاب لا يمارسون التصنيف/ الترتيب/ التنظيف، أعط توجيهاتك على الفور فيما يتعلق بالتصنيف/ الترتيب/ التنظيف، وسوف يكونون قادرين على اكتساب عادة التصنيف/ الترتيب/ التنظيف. عند إعطاء التوجيهات الخاصة بالتصنيف/ الترتيب/ التنظيف، من المفيد تشجيع الطلاب على أن ينتبهوا دائماً على التصنيف/ الترتيب/ التنظيف من خلال الإشارة إلى القواعد في الملصقات المعدة لذلك.

يجب تقديم التوجيهات بشأن الممارسة المتكررة مرارًا وتكرارًا في الدرس العملي: في بداية الحصة، وأثناء الحصة، وفي نهاية الحصة.

الوقت	السلوك المستهدف للطلاب	كيف يقوم المعلمون بتقديم توجيهاتهم
في بداية الحصة	✓ يجمع الطلاب الأدوات/ المواد الضرورية.	✓ يوضح المعلم للطلاب ما هي الأدوات والمواد الضرورية للعمل في الدرس، ويطلب من الطلاب جمعها.
أثناء الحصة	✓ يحافظ الطلاب على طاولة العمل منظمة ومرتبطة. ✓ يكون الطالب أول من يلتقط أي نفايات على الأرض ويتخلص منها وفقًا للقواعد.	✓ يتجول المعلم بين الطلاب للتأكد من أن طاولة العمل دائمًا منظمة ومرتبطة. ✓ يوجه المعلم الطلاب ليكونوا أول من يلتقط أي نفايات على الأرض ويتخلص منها وفقًا للقواعد.

كيف يقوم المعلمون بتقديم توجيهاتهم	السلوك المستهدف للطلاب	الوقت
<p>✓ يوجه المعلم الطلاب لتنظيف المعدات والأدوات المستخدمة. اعرض طريقة التنظيف الصحيحة.</p> <p>✓ يوجه المعلم الطالب لإعادة الأدوات/ المواد المستخدمة في الدرس إلى أماكنها الأصلية.</p> <p>✓ يشرف المعلم على طريقة الطلاب في التنظيف.</p>	<p>✓ ينظف الطلاب المعدات والأدوات المستخدمة.</p> <p>✓ يقوم الطلاب بإعادة الأدوات/ المواد المستخدمة إلى أماكنها الأصلية.</p> <p>✓ ينظف الطلاب الورشة طبقاً لقواعد التنظيف.</p> <p>✓ إذا كان هناك أي نفايات للتخلص منها بعد العمل، يقوم الطلاب بالتخلص منها وفقاً للقواعد.</p>	في نهاية الحصة
<p>✓ يتأكد المعلم من أن الأدوات/ المواد المستخدمة في الدرس قد تم إرجاعها إلى أماكنها الأصلية، وأن الأدوات في حالة سليمة (فحص الأدوات). في حالة العثور على أي مشاكل، يحدد المعلم الطالب الذي كان يستخدم الأداة، ويسأله عما حدث ويعطي تعليمات صارمة.</p>		بعد انتهاء الحصة

## **مصاح مهمة للممارسة والتوجيهات المتكررة**



يمكن اكتساب الجدارات من خلال الممارسة المتكررة البسيطة. ومع ذلك، هناك بعض الأشياء التي يمكن إضافتها لمساعدة الطلاب على التعلم بشكل أكثر كفاءة.

(١) تأكد من أن الطلاب لديهم احساس بالهدف: من أجل جعل الطلاب يكتسبون المعرفة والجدارات بكفاءة، يحتاج الطلاب إلى الشعور بالهدف. لذلك، يجب شرح ضرورة كل جدارة مرارًا وتكرارًا في بداية الدرس العملي. بالنسبة لشعار (3S) (التصنيف، الترتيب، التنظيف)، يتم التأكيد على التوجيهات طوال الدرس العملي.

(٢) اطلب من الطلاب مراجعة تصرفاتهم: إن جعل الطلاب بأنفسهم يدركون ويراجعون ما إذا كانوا يتخذون إجراءات صحيحة يساعد أيضًا في تحويل الإجراءات الصحيحة إلى عادة. خلال الدروس العملية، يُنصح الطلاب كل على حدة بمراجعة تصرفاتهم والتفكير مع جميع الطلاب في نهاية الدرس العملي من خلال عرض أمثلة على السلوكيات الخاطئة الموجودة أثناء الدروس.

(٣) يكون المعلم نموذجًا يحتذى به بالنسبة للطلاب: يعد المعلم نموذجًا يحتذى به بالنسبة للطلاب. إذا لم يمارس المعلم السلوكيات الآمنة الصحيحة، فسوف يتبعه الطلاب. إذا كان الطلاب لا يتخذون إجراءات صحيحة، فسوف يبدو الأمر كما لو أن المدرسة تؤكد أن معلمها لا يتخذون الإجراءات الصحيحة. يجب أن يكون المعلمون دائمًا على وعي بأن الطلاب يشاهدونهم، ويعيدوا التفكير في كيفية أدائهم واتخاذ إجراءات للتحسين المستمر.

(٤) يجب أن يكون لدى المدرسين فهم مشترك للتعليمات: سوف يرتبك الطلاب إذا لم يشترك المعلمون في نفس الفهم وقاموا بتقديم إرشادات مختلفة. من الضروري للمعلمين عقد اجتماعات منتظمة لموظفي المدرسة واجتماعات القسم لضمان وجود فهم مشترك للتعليمات.

## **التكلفة:**

لا توجد تكلفة إضافية (بينما قد تكون هناك تكلفة خلال عملية التحضير، إلا أن التوجيهات المتكررة نفسها لا تتضمن أية تكلفة إضافية).



## **مستوى متقدم من التوجيهات المتكررة**

سوف يتم نسيان الجدارة إذا لم تستخدم. على وجه الخصوص، بعد فترات الإجازة الطويلة في المدرسة، من المحتمل جدًا أن يكون الطلاب قد نسوا المعارف والمهارات التي تعلموها أو فقدوا قدرتهم على ممارستها. من الأفضل إعادة التحقق من مقدار ما يتذكره الطلاب من التصنيف/الترتيب/التنظيف، بعد الانقطاع عن المدرسة لفترة طويلة.



متقدم



## أداة الفحص:



من أجل مراجعة التصنيف/ الترتيب/ التنظيف، بعد الدرس العملي، يقوم المعلم بمراجعة كشف المراجعة الموضح أدناه قبل نهاية الدرس العملي. وبناءً على المراجعة، إذا كان هناك شيء لم يتم القيام به بشكل جيد، يقوم المعلم بتوجيه الطالب لتصحيح الوضع قبل نهاية الدرس العملي.

التاريخ	من قام بالمراجعة ؟	الفصل	لا توجد نفايات على الأرض	تم التخلص من النفايات حسب القواعد	تم تنظيف الأدوات/ المعدات المستخدمة	تم إعادة الأدوات، المعدات، الخيام المستخدمة إلى أماكنها الأصلية	تم تنظيم وترتيب طاولات العمل والكراسي وتنظيفها بواسطة المنفضة
يوم/ شهر	X	١/١	✓	✓	✓	✓	✓
يوم/ شهر	Y	١/٢	✓	✓	✓	✓	✓

## تعزيز الاستقلالية لدى الطلاب:



عندما يعتاد الطلاب على التصنيف/ الترتيب/ التنظيف، انتقل إلى الأنشطة التي تشجع الطلاب على التصرف بشكل مستقل، مثل اتخاذ قرار بشأن سير العمل لجعل الطلاب يقومون بالمراجعة والاحتفاظ بالسجلات بأنفسهم، مع الرجوع إلى كشف المراجعة أعلاه المعروض على حائط الورشة، واطلب منهم إبلاغ المعلم عند الانتهاء. يوصى بهذا الانتقال إلى العمل المستقل للطلاب في السنة الثانية فما فوق. قبل الانتقال، تأكد من أن الطلاب يتقنون معرفة التصنيف/ الترتيب/ التنظيف.

## **الفصل 0: تنفيذ الممارسة المتكررة للجدارة (٤): إدارة الوقت**

### **١-0 وصف الجدارة:**

يقوم بشكل مستقل بإدارة الوقت بالشكل المتوقع في المصنع.

### **الشرح:**

إن إدارة الوقت هي جدارة بالغة الأهمية في الموقع، كما هو الحال في المصانع التي يوجد بها عدد كبير من العمال. عندما يبدأ الجميع في العمل بعد الاستراحة، إن غياب شخص واحد قد يعني أن هناك فجوة في العملية، مما يقلل من كفاءة العمل. لا يتأخر العمل فحسب، بل قد يؤدي ذلك أيضًا إلى حدوث ضرر أو حادث كبير، وهذا سبب آخر لحاجة المدارس الثانوية الفنية إلى تعليم طلابها إدارة الوقت بشكل مستقل. يجب على المعلمين شرح أهمية "إدارة الوقت" والتأكد من أن الطلاب يفهمون ويدركون ويمارسون "إدارة الوقت".

تتطلب جدارة إدارة الوقت مهارات عديدة من ضمنها: الانضباط والاحساس بالهدف، والوعي بالغاية، والتخطيط، وترتيب الأولويات، والقدرة على التنفيذ. على سبيل المثال، يبدو الحضور إلى الدروس العملية في الوقت المحدد أمر سهل للغاية. ولكن، من أجل التصرف على هذا النحو، يحتاج الطالب أولاً إلى القدرة على التخطيط، ومعرفة الوقت المحدد لمغادرة الفصل للذهاب إلى الدرس العملي مع الأخذ في الاعتبار وقت ارتداء ملابس العمل والذهاب إلى ورشة العمل. يحتاج الطالب أيضًا إلى الانضباط، حتى يكون قادرًا على رفض أي دعوة تتعارض مع إدارة الوقت. بهذه الطريقة، فإن اكتساب هذه الجدارة أمر يؤدي إلى تطوير مجموعة واسعة من القدرات بشكل متزامن. يركز هذا الدليل على تقليل التأخر كوسيلة لاكتساب هذه الجدارة.

يتم تطبيق "إدارة الوقت" من خلال الجهود المتضافرة التي تشمل المدرسة بأكملها. على هذا النحو، تتطلب إدارة الوقت فهم وتعاون جميع المعلمين. يحدد ناظر المدرسة إعداد معايير ونظام إعطاء التوجيهات طبقاً لظروف المدرسة. يجب على جميع المعلمين بعد ذلك التعاون في وضع وإعطاء التوجيهات للطلاب. بالإضافة إلى ذلك، ونظرًا لارتباطها بشكل كبير بأنماط حياة الطلاب، يجب أيضًا السعي للحصول على تعاون الوالدين/أولياء الأمور عند الضرورة.

## ٢-٥ التحضيرات اللازمة للتوجيهات

### (١) وضع معايير وقت الاستعداد للحصة التالية وإبلاغها للطلاب

لا تحتوي الجداول الزمنية الحالية في المدارس الثانوية الفنية على فواصل زمنية بين الحصص. هذا يعني أنه من المستحيل أن يتواجد الطلاب في الوقت المحدد إذا احتاجوا إلى الذهاب إلى فصل آخر للدرس التالي. هذا هو الشيء نفسه مع المعلمين. نظرًا لعدم وجود وقت للتنقل بين الفصول، فمن المستحيل أن تبدأ الدروس في الوقت المحدد. في مثل هذه البيئة، من الصعب تحويل إدارة الوقت إلى عادة. لذلك، من أجل اكتساب عادة إدارة الوقت، تقوم المدرسة بإنشاء معيار لوقت الاستعداد للحصة التالية (بما في ذلك الانتقال إلى الفصل التالي). في هذا الدليل، يوصى بالاختيار بين الخيارين التاليين.

- يتم تطبيق استراحة مدتها ٥ دقائق بين كل حصة: إذا لم يكن من الممكن تغيير الوقت الذي ينتهي فيه اليوم المدرسي، يتم اقتطاع خمس دقائق من وقت كل حصة، وتحديد وقت للاستراحة. إذا امتدت إحدى الحصص لفترات متعددة، فيجب على المعلم تحديد موعد الاستراحة بناءً على تقدم الدرس.
- ينتهي المعلم من الدرس قبل ٥ دقائق قبل موعد نهاية الحصة: لا يطلق على هذه الدقائق الخمس من نهاية الحصة إلى بداية الحصة التالية "استراحة" بل "وقت الاستعداد".

### عرض الجدول الأسبوعي



من أجل تحقيق إدارة الوقت، من الضروري أن تكون على دراية بالجدول التالي، وحساب الوقت، واتخاذ الإجراءات اللازمة. لكي يكتسب الطلاب هذه العادة، سيتم وضع جداول زمنية مدتها أسبوع واحد بما يتماشى مع "معياري وقت الاستعداد للحصة التالية" ليتم عرضه على حوائط جميع الفصول وورش العمل. يفضل أن يتم وضع جداول الحصص لكل فصل، مع تحديد وقت الدرس لكل حصة، والموضوعات، والفواصل بين الحصص، وما إلى ذلك. يجب نشر جداول الحصص في أماكن واضحة، وفي حجم يسهل رؤيته للطلاب. يجب أيضًا الانتباه إلى اختيار مكان مناسب لعرض جداول الحصص، مثل الحائط الأمامي لكل فصل أو بالقرب من الأبواب حتى يتمكن الطلاب من مراجعتها بانتظام.

### مثال لنموذج جدول حصص لأسبوع واحد:



الخميس	الأربعاء	الثلاثاء	الاثنين	الأحد	السبت	الوقت	الحصّة
							طابور الصباح
							١
							فاصل زمني
							٢
							فاصل زمني
							٣
							فاصل زمني
							٤
							استراحة
							٥
							فاصل زمني
							٦
							فاصل زمني
							٧
							فاصل زمني
							٨
							فاصل زمني
							٩

### نصائح مهمة لإعطاء التوجيهات



من المفيد طباعة وتوزيع جدول الحصص على الطلاب، أو جعل الطلاب ينقلون الجدول في كراساتهم ويحملونه معهم.

### التكلفة:



الأوراق (لعمل الجداول).

## (٢) تطوير نظام يتيح للمعلمين والطلاب معرفة وقت بداية الحصة التالية

من أجل تحويل إدارة الوقت إلى عادة، من الضروري أيضًا تطبيق نظام يتيح لجميع الطلاب والمعلمين معرفة وقت بدء الحصة التالية. في هذا الدليل، يوصى بتطبيق كلا الخطين التاليين، ولكن قد يتم تصميم طريقة التطبيق وفقًا للوضع الحالي لكل مدرسة.



الخطة ١: تثبيت ساعات الحائط في كل فصل (بما في ذلك ورش العمل).

الخطة ٢: تركيب نظام للتنبيه بالجرس، وما إلى ذلك في بداية ونهاية كل حصة.

### نصائح مهمة لإعداد النظام:

إذا كان توقيت الساعة أو الجرس غير دقيق، فقد يعتقد الطلاب أن "الساعة أو الجرس غير موثوق بهما". إذا كان هناك ساعة أو جرس توقف بسبب نفاذ البطارية أو أنها لا تشير إلى الوقت الصحيح، من المهم ضبط الساعة أو الجرس عن طريق استبدال البطارية على الفور، وما إلى ذلك. من المهم أيضًا وضع خطة إدارية واقعية.



### مثال لأداة لإدارة الوقت:

جدول متابعة نظام الجرس الإلكتروني



التاريخ	اسم المراجع	حالة الساعة في الجرس	حالة الجرس	الشخص المسئول	وصف المشكلة
		<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>		

ضع علامة X في خانة "حالة الساعة" و"حالة الجرس" إذا وجدت أي مشكلة فيهما.

ضع علامة ✓ في خانة "حالة الساعة" و"حالة الجرس" عندما تكون الساعة تعمل بشكل جيد

### **التكلفة:**

ساعات الحائط الجرس, الخ.



### **(٣) إبلاغ الطلاب ما هي العواقب المترتبة على عدم إتباع معايير سلوك إدارة الوقت (التأخير)**

أبلغ الطلاب العواقب (القواعد) التي سيتم تطبيقها من قبل المدرسة ووزارة التربية والتعليم والتعليم الفني على الطلاب إذا فشلوا في إتباع معايير الالتزام بالوقت.

### ٣-٥ أساليب التدريس الأساسية للممارسة المتكررة:

يجب إعطاء توجيهات إدارة الوقت ليس فقط أثناء الدرس العملي ولكن أيضًا من خلال الممارسة المتكررة اليومية طوال فترة الحياة المدرسية. لا يقتصر الأمر على معلمين بعينهم، بل يجب على جميع المعلمين، بمبادرة من المعلم المسؤول كما هو موضح في الجدول أدناه، توعية الطلاب حول "الحفاظ على الوقت" وجعلهم يكتسبون عادة سلوك إدارة الوقت.

المعلم المسؤول	كيف يعطي المعلمون توجيهاتهم	السلوك المستهدف للطلاب	الوقت
مشرف اليوم	<p>✓ يطلب المعلم من الطلاب أن يصفوا في مكان محدد قبل بداية طابور الصباح.</p> <p>✓ يوجه المعلم للطلاب المتأخرين وفقًا للمعايير وسأل عن سبب التأخر. إذا كان التأخير لأسباب شخصية لدى الطلاب، فعليك أن تنصحهم بعدم التأخر مرة أخرى وتطبيق تدابير التحسين حسب الضرورة.</p>	<p>✓ يصف الطلاب في المكان المحدد</p>	طابور الصباح
مشرف اليوم	<p>✓ يتجول المعلم في المدرسة لمعرفة ما إذا كان الطلاب يستعدون للحصة التالية.</p> <p>✓ يوجه المعلم الطلاب للانتقال إلى المكان المحدد للدرس التالي، مثل الفصل أو ورشة العمل، أثناء وقت الاستعداد.</p>	<p>✓ يقوم الطلاب بالاستعداد للحصة التالية باستخدام الوقت المخصص لذلك.</p>	وقت الاستعداد للحصة التالية
مدرس الفصل	<p>✓ يوجه المعلم الطالب المتأخر وفقًا للمعايير، ويسأل عن سبب التأخر، وإعطاء التعليمات حسب الضرورة.</p>	<p>✓ يجلس الطلاب في بداية الدرس (مرتدين زي الورشة للدرس العملي)</p>	أثناء الحصة (جميع الحصص)
مشرف اليوم	<p>✓ يتجول المشرف في المدرسة، وإذا وجد أي طالب خارج الفصل أو ورشة العمل، فيقوم بإعطاء تعليمات للطلاب للذهاب إلى الفصل أو ورشة العمل.</p>		
الأخصائي الاجتماعي	<p>✓ وفقًا لمعايير المدرسة ووزارة التربية والتربية والتعليم والتعليم الفني، يقوم الأخصائي الاجتماعي بتقديم التوجيه الشخصي للطلاب الذي غالبًا ما يتأخر والتواصل مع الوالدين/ ولي الأمر للطلاب. يفكر الأخصائي مع الطالب حول التدابير اللازمة بما في ذلك مراجعة نمط الحياة وتقديم النصيحة له.</p>		التوجيه الشخصي للطلاب الذي غالبًا ما يتأخر



## **نصائح مهمة للممارسة والتوجيهات المتكررة:**

يُكمن اكتساب الجدارات من خلال الممارسة التكرارية البسيطة. ومع ذلك، هناك بعض الأشياء التي يمكن إضافتها لتساعد الطلاب على التعلم بكفاءة أفضل.

(١) اطلب من الطلاب مراجعة نمط حياتهم: بدلاً من مجرد التركيز على الالتزام بالمواعيد، يجب أن يتضمن التعليم فهماً للبيئة الكلية اللازمة لتمكين الالتزام بالمواعيد (على سبيل المثال: الإعداد في اليوم السابق، واستيعاب المدة التي تستغرقها للذهاب إلى المدرسة، الوضع في الحصة السابقة، وما إلى ذلك).

(٢) التأكيد من أن لدى الطالب إحساس بالهدف: من أجل جعل الطلاب يكتسبون المعرفة والمهارات بكفاءة، يحتاج الطلاب إلى الإحساس بالهدف. هناك فرص للتأكيد على أهمية إدارة الوقت طوال فترة وجود الطلاب في المدرسة.

(٣) اطلب من الطلاب مراجعة سلوكهم: يمنح المعلمون الطلاب وقتاً للتفكير في أسباب أهمية إدارة الوقت. قدم أمثلة مختلفة لإظهار أهمية إدارة الوقت. تقدر الشركات إدارة الوقت لأنها تساعد على إنتاج منتجات تلبي متطلبات العملاء. أحد الأمثلة على ذلك هو كيف تمنع الشركات تماقاً التأخر في الصباح لأنها تتواصل وتتبادل المعلومات المهمة في الاجتماعات الصباحية لتحسين الجودة. في بعض الشركات، قد يتقلص رواتب الأشخاص الذين يتأخرون في كثير من الأحيان أو قد يفقدون وظائفهم. يوفر المعلمون الفرص للطلاب لمراجعة سلوكهم من خلال تقديم مثل هذه الحالات وشرح أهمية الالتزام بالمواعيد.

(٤) يكون المعلم نموذجاً يحتذى به بالنسبة للطلاب: يعد المعلم نموذجاً يحتذى به بالنسبة للطلاب. إذا كان المعلم لا يمارس إدارة الوقت، فسيبتعه الطلاب. إذا كان الطلاب لا يتخذون إجراءات صحيحة، فإن الأمر كما لو أن المدرسة توضح أن معلمها لا يتخذون الإجراءات الصحيحة. يجب أن يكون المعلمون دائماً على وعي بأن الطلاب يشاهدونهم، ويعيدوا التفكير في كيفية أدائهم وإجراء تحسينات.

(٥) يجب أن يكون لدى المدرسين فهم مشترك للتعليمات: سوف يختلط الأمر على الطلاب إذا لم يشارك المعلمون نفس الفهم وقدموا إرشادات مختلفة. من الضروري للمعلمين عقد اجتماعات منتظمة لموظفي المدرسة واجتماعات القسم لضمان وجود فهم مشترك للتعليمات.



## **التكلفة:**



لا توجد تكلفة إضافية ضرورية (في حين قد تكون هناك تكاليف أثناء التحضير، إلا أن التوجيهات المتكررة نفسها لا تتضمن أية تكلفة إضافية).

## **دع الطلاب يفكرون:**



يأخذ معلم الدرس العملي "أ" الخمس دقائق الأولى في بداية الدرس لجعل الطلاب يفكرون في ضرورة إدارة الوقت.

**المعلم "أ":** اليوم، دعونا نفكر لماذا يعتبر سلوك إدارة الوقت ضرورياً. ما هي المشكلات التي تعتقد أنها سوف تقع إذا تأخرت عن حضور الدرس العملي؟

**الطالب "أ":** سوف يفوتني شرح المعلم للتدابير الوقائية للأمن والسلامة.

**الطالب "ب":** لن أكون قادراً على البدء في عملي بدون شرح ما هو هذا العمل. أيضاً، بما أنني لن أعرف الطريقة الصحيحة للقيام بالعمل، فلن أكون قادراً على تنفيذ العمل كما هو مطلوب.

**الطالب "ج":** حيث أنني لم أسمع عن التدابير الوقائية، فقد أتسبب في وقوع حادث أثناء العمل. إذا تسببت في وقوع حادث، فقد أصيب ليس فقط نفسي ولكن أيضاً طلاب آخرون.

**المعلم "أ":** هذا صحيح. إذا فاتتك أمور أو رسائل مهمة بسبب تأخرك، فلن تستطيع القيام بالعمل بطريقة سليمة وآمنة. يجب عليك فهم ضرورة إدارة الوقت وتعلم إدارة الوقت في الحياة المدرسية.

## **فكر في خطط التحسين مع الطلاب:**



بالنسبة للطلاب الذين يتأخرون كثيراً في الحضور، لا يكفي أن تخبرهم أن عليهم ألا يتأخروا. اسألهم عن حياتهم اليومية وعاداتهم في النوم أو وضعهم في المنزل قبل الحضور للمدرسة، واطلب منهم مراجعة أسلوب حياتهم وأرشدهم حول كيفية إدارة حياتهم اليومية. من المستحسن أن تفكر في خطط التحسين مع الطلاب (مثلاً اجعل الطالب يحصل على ساعة). إذا كان هناك طالب يتأخر بصورة غير طبيعية، قد يكون من المفيد أن تناقشه على انفراد وتطلب من الأب/ ولي الأمر الاشتراك في المناقشة.

## أداة المراجعة:



من الممكن فهم حالة كل طالب وفصل عن طريق تسجيل الحضور/ التأخر/ الغياب والاحتفاظ بالسجلات. إن عمل رموز مخصصة للحضور والتأخر والغياب كما هي موضحة أدناه يجعل تسجيل والاحتفاظ بالبيانات أسهل.

إجمالي الشهر		التاريخ					اسم الطالب	
التأخير	غياب	اليوم/الشهر	اليوم/الشهر	اليوم/الشهر	اليوم/الشهر	اليوم/الشهر		
0	0	✓	✓	✓	✓	✓	أ	1
1	2	✓	X	X	X	✓	ب	2
~~~~~								
1	1	✓	X	✓	✓	X	د	9
0	0	✓	✓	✓	✓	✓	ر	10
6	11						إجمالي عدد الطلبة	

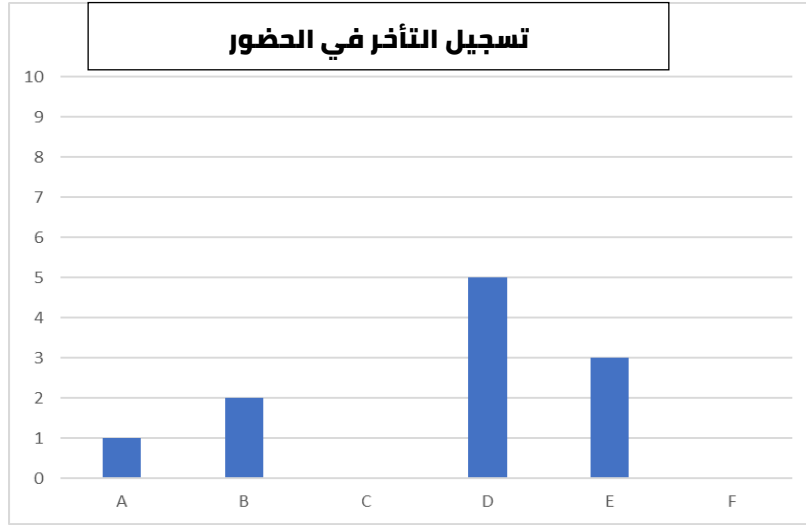
✓: يحضر في الموعد /: يحضر متأخراً x: غائب

## **التمثيل البياني، والتشجيع، والمنافسة الجماعية:**



متقدم

من المستحسن أيضًا تمثيل بيانات السجلات اليومية للتأخير باستخدام الرسوم البيانية، حتى يتمكن الطلاب من معرفة وضعهم بسرعة، على سبيل المثال، في الرسم البياني أدناه، يُظهر المحور الأفقي الحصص ويظهر المحور الرأسي عدد الطلاب المتأخرين في كل حصة. لمدة فصل دراسي واحد (أو حتى شهر واحد)، احتفظ بسجل للطلاب المتأخرين لكل فصل، يمكن للفصول أن تتنافس مع بعضها البعض، أو قد يكون من الجيد أيضًا الثناء على الطلاب الذين لا يتأخرون أبدًا.



## **التحسينات السنوية:**



متقدم

في نهاية العام الدراسي، يتم عقد اجتماع على مستوى المدرسة، لمناقشة المشكلات والإنجازات حول التوجيهات بشأن إدارة الوقت على مدار العام، وإذا لزم الأمر، يتم إدخال تحسينات على أساليب التعلم بشأن إدارة الوقت.

## **الفصل ٦: الشراكة مع المصانع لاكتساب الجدارات المطلوبة من قبل المصانع**

لكي يكتسب الطلاب الجدارات المتوقعة من قبل المصانع، يجب أن يتأكد المعلمون من أن معرفة الطلاب ومهاراتهم راسخة تماماً من خلال إعطاء توجيهات للطلاب بشكل متكرر في الدروس العملية. من أجل جعل الطلاب يمارسون الجدارات بشكل متكرر بدافع من أنفسهم، يجب أن يكون المعلمون على دراية باحتياجات المصانع، على سبيل المثال من خلال القيام بزيارات للمصانع، وإيصال هذه الاحتياجات إلى الطلاب بطريقة يستطيعون فهمها. يناقش هذا الفصل كيفية فهم هذه الاحتياجات من خلال الأنشطة بالشراكة مع المصانع.

### **١-٦ أهداف الشراكة مع المصانع**

هناك هدفان للشراكة مع المصانع.

(١) تمكين المعلمين من فهم احتياجات المصانع.

(٢) تمكين المعلمين من فهم متطلبات التوظيف وظروف العمل في المصانع.

إن وجود الفهم يسمح للمعلمين بتقديم توجيهات للطلاب حول احتياجات المصانع وإيجاد فرص العمل. إن تزويد الطلاب بمعلومات مثل (أ) متطلبات التوظيف، (ب) ظروف العمل، (ج) المسار الوظيفي بعد توظيفهم في المصانع، يمكن أن يزيد من حافز الطلاب للتعلم في المدارس الثانوية الفنية. كما أنه سيقبل من عدم التطابق في اختيار المهنة، والذي يمكن أن يؤدي بدوره إلى خفض معدل الخريجين الذين يتركون وظائفهم.

### **٢-٦ كيفية العثور على مصانع لإقامة شراكات معها**

أسهل طريقة للعثور على شركات لتتعاون معها هي عبر شبكة الخريجين<sup>١</sup>. يوصى بأن تقوم المدارس بجمع معلومات عن مكان أعمال الخريجين والعثور على المصانع التي يمكن أن تتشارك معها من خلال بيانات الخريجين الذين بدأوا العمل في المصانع.

هناك ثلاث طرق أساسية لجمع المعلومات عن أماكن عملهم. يجب على كل مدرسة النظر في طريقة تجميع مصانع لإقامة شراكة معها من الخريجين.

(١) التجميع عن طريق الاتصال بالخريجين بعد فترة زمنية معينة بعد التخرج.

(٢) الطلب من الطلاب قبل تخرجهم إبلاغ المدرسة إذا حصلوا على وظيفة.

(٣) عقد ملتقيات للتوظيف ودعوة الخريجين إلى المدارس، وجمع المعلومات بعد التخرج.

<sup>١</sup> من الممكن أن تطلب المدارس المزدوجة من الوحدات الإقليمية العثور على المصانع.

يقدم هذا الدليل طريقة لاستخدام نظام وزارة التربية والتعليم والتعليم الفني الحالي (دفتر ٣١ للطلاب يتم وضعه من قبل كل مدرسة كل عام<sup>٢</sup>). التحويل إلى بيانات إلكترونية لمعلومات المسار الوظيفي ليس ضروريًا دائمًا. ومع ذلك، من الممكن تطوير قاعدة بيانات المسار الوظيفي بكفاءة إذا كانت المدرسة تستخدم قواعد البيانات الحالية.

الوقت	الطريقة
بعد القبول	<ul style="list-style-type: none"> <li>• عندما تقوم المدرسة بجمع المعلومات لدفتر ٣١ للطلاب، تحقق من الوظيفة المطلوبة للطلاب. صُنِّف المهن المرغوبة إلى (١) الدراسة، (٢) الدراسة والعمل، (٣) العمل، (٤) أخرى.</li> <li>• أضف عمود "الوظيفة المرغوبة" في دفتر ٣١ للطلاب وقم بإدخال المعلومات.</li> </ul>
سنوات الدراسة في المدرسة	<ul style="list-style-type: none"> <li>• يقدم المعلمون النصائح المهنية المناسبة للطلاب عن طريق استيعاب الوظيفة المرغوبة لكل طالب.</li> <li>• قد تتغير الوظيفة المرغوبة للطلاب على مدار ثلاث سنوات. لذلك، يوصى بأن تقوم المدرسة بتطوير قواعد البيانات في وقت التسجيل، والتحديث في بداية الصفوف الثاني والثالث.</li> </ul>
بعد التخرج	<ul style="list-style-type: none"> <li>• اجمع المعلومات من مكان العمل من الخريجين. من الممكن العثور على الخريجين الذين بدأوا العمل في المصانع بكفاءة عن طريق الاتصال بالخريجين الذين سعوا للعمل في أيام دراستهم مع الإشارة إلى بيانات الوظيفة المرغوبة التي تم جمعها في أيام الدراسة.</li> <li>• أضف عمود "مكان العمل" في دفتر ٣١ وقم بإدخال البيانات.</li> <li>• ابحث عن المصانع للمشاركة معها مع الإشارة إلى المعلومات الموجودة في قاعدة البيانات.</li> </ul>



### التكلفة؛



لا توجد تكلفة إضافية ضرورية (لأنه يمكن استخدام قاعدة البيانات الموجودة).

<sup>٢</sup> يحتوي دفتر ٣١ على معلومات بيانات الطلاب الجدد. تحتفظ كل مدرسة بهذه الدفاتر أثناء سنوات دراسة الطلاب في المدرسة (ثلاث سنوات) ولمدة ثلاث سنوات بعد تخرجهم.

## ٣-٦ أمثلة لتنفيذ أنشطة بالشراكة مع المصانع

على الرغم من اختلاف نظام شراكات المدارس الثانوية الفنية مع المصانع بين المدارس المزدوجة والمدارس الثانوية الفنية التقليدية، إلا أنها تشتمل بشكل أساسي على الأنشطة الأربعة التالية:

- ١) نصيحة مهنية من الخريجين (جلسة نصح من قبل الخريجين للخريجين).
- ٢) جلسة تعريفية للطلاب عن المصانع.
- ٣) زيارات المصانع.
- ٤) التدريبات داخل المصنع.

يتم تقديم أمثلة تفصيلية لكل نشاط في الجداول التالية.

### **كشف سجل النشاط:**

قم بوضع كشف كما يلي لتسجيل الأنشطة. يتيح ذلك للأطراف المعنية في المدرسة تبادل البيانات حول المصانع التي أقامت معها المدرسة شراكة في الماضي.

نوع النشاط	اسم المصنع	عدد المشاركين		المسئول عن التنفيذ	الفصل	القسم	الصف	التاريخ	الرقم
		ذكور	إناث						
									1
									2



البند	الوصف
اسم النشاط	نصيحة مهنية من الخريجين (جلسة نصح من قبل الخريجين)
الموضوع	يتحدث الخريجون الذين بدأوا العمل بعد التخرج عن تجاربهم الشخصية للطلاب الحاليين في المدرسة.
المكان	المدرسة
مراحل تنظيم برنامج النشاط	(١) قم باختيار الخريجين المناسبين الذين لديهم وظيفة واطلب منهم المشاركة في الدورات. (٢) قم بإعداد التوجيه للخريجين لشرح الخبرات والنصائح التي ينبغي إدراجها في خطبهم للطلاب. (٣) قم بتنفيذ الجلسة.
مثال للبرنامج	(١) الكلمة الافتتاحية: المدير (٥ دقائق) (٢) الأهداف وجدول الأعمال: وحدة الانتقال إلى سوق العمل (٥ دقائق) (٣) استبيان قبل الجلسة: وحدة الانتقال إلى سوق العمل (١٠ دقائق) (٤) كلمات الخريجين (٤٠ دقيقة) * الكلمات تشمل: • كيف قرروا مسارات حياتهم المهنية. • ما نوع الجهود / التحضيرات التي بذلوها لإيجاد وظائف. • ما الصعوبات التي واجهوها في العثور على وظائفهم. • ما هي الجدارات المطلوبة في مكان عملهم. • أي نصيحة للطلاب لتحديد مسار حياتهم المهنية في المستقبل. (٥) مناقشات جماعية (٤٥ دقيقة). ينفصل الطلاب إلى ٤ مجموعات، مجموعة واحدة لكل خريج ويشاركون في مناقشات جماعية. (٦) استبيان بعد الجلسة: وحدة الانتقال إلى سوق العمل (١٠ دقائق) (٧) الكلمة الختامية: المدير (٥ دقائق)
دور المدرسة	طلب وتنسيق مع الخريجين. قم بإعداد المكان وإدارة الحدث. قم بإجراء استبيان للطلاب قبل الجلسة وبعدها.
المشاركون المستهدفون	مدارس النظام العام: جميع الصفوف المدرسية (يوصى بطلاب السنة الثالثة) مدارس النظام المزجج: جميع الصفوف المدرسية.

<b>ملاحظات</b>	<p>✓ اختيار الخريجين: قد يكون لدى المصنع نفسه وظائف مختلفة في أقسام مختلفة، لذلك اختار الخريجين من مجموعة متنوعة من الأقسام، مثل التصنيع أو مراقبة الجودة أو المحاسبة. لاحظ أيضًا أنه إذا أوضح الخريج كيف أن الجدارات الأربعة مطلوبة في وظائفهم، فسيؤدي ذلك إلى تعميق فهم الطلاب.</p> <p>✓ اشرح ما يلي للخريجين مقدمًا. أ) الغرض: تحفيز الطلاب على القيام بالأنشطة المدرسية المختلفة من خلال جعلهم يفهمون ما ينطوي عليه العمل الفعلي. ب) ما ينبغي إدراجه في الخطاب. (بما في ذلك الجدارات الأربعة).</p> <p>عدد الخريجين: حوالي ٤</p>
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البند	الوصف
اسم النشاط	جلسة تعريفية للطلاب عن المصانع
الموضوع	يعرض المصنع معلومات التوظيف.
المكان	المدرسة
مراحل تنظيم برنامج النشاط	(١) اختيار المصانع. (٢) تحديد مواعيد الزيارة. (٣) مناقشة البرنامج. (٤) تنفيذ البرنامج (انظر البرنامج أدناه). (٥) تنظيم جلسات مناقشة للطلاب لمشاركة ما تعلموه.
مثال للبرنامج	(١) كلمة افتتاحية (مدير المدرسة). (٢) يقدم ممثل المصنع عرضًا توضيحيًا لما يلي: - وصف المصنع - المؤهلات المطلوبة للتوظيف، تتضمن الخلفية الأكاديمية، والدرجات الدراسية، والجدارات، إلخ. - المسار الوظيفي بعد التعيين (الوضع الوظيفي والجدارات اللازمة). - المسار الوظيفي للخريجين في المصنع (إذا تم توظيف الخريجين في المصنع). - بيئة العمل (موقع المصنع، وجود كافيتريا للعاملين، إلخ). - بنود وظروف العمل (الراتب، العلاوات، عدد ساعات العمل، الأجازات، إلخ). - موعد التوظيف القادم (عدد الوظائف في خطة التوظيف، الجدول الزمني للتوظيف، إلخ). (٣) جلسة أسئلة وأجوبة. (٤) كلمة ختامية (مدير المدرسة).
دور المدرسة	طلب التعاون والتنسيق مع المصانع. تحديد مكان الاجتماع وإدارة الحدث.
المشاركون المستهدفون	<u>مدارس النظام العام</u> : الطلاب من جميع السنوات الدراسية والآباء/ أولياء الأمور. <u>مدارس النظام المزدوج</u> : الطلاب المتقدمين للمدرسة وآبائهم/ أولياء أمورهم (يتم إجراء النشاط في الوقت الذي يتم فيه قبول طلبات التحاق الطلاب). إذا لزم الأمر، يتم أيضا عقد النشاط قبل تخريج طلاب السنة

الثالثة.	
<p>✓ جلسات للآباء/ أولياء الأمور: لدى الآباء/ أولياء الأمور أيضًا مفهوم خاطيء أن التعليم العالي يترجم مباشرةً إلى أجور أعلى، لذا فهم يشجعون الطلاب على مواصلة دراستهم. لذلك، الجلسات الموجزة للآباء/ أولياء الأمور مهمة لتوضيح هذا المفهوم.</p> <p>✓ جلسات من قبل الخريجين: يُفضل مشاركة الخريجين إذا كان هناك أي منهم يعمل في المصنع (إذا لم يكن هناك أي مرشح من المدرسة، يُمكن للمدرسة دعوة خريجين من المدارس المجاورة). إن الاستماع إلى قصص شخصية حول ما يفعله الخريجون في المصنع يساعد الطلاب على الشعور بأنهم أقرب إلى فكرة الحصول على وظيفة في المصنع.</p>	<p><b>موضوعات مختلفة</b></p>



البند	الوصف
اسم النشاط	زيارة المصانع
الموضوع	عرض مكان العمل الفعلي للطلاب للحصول على تأثير أكبر من إحاطة المصنع.
المكان	مواقع الشركة (المصنع/ المكاتب)
مراحل تنظيم برنامج النشاط	(١) اختيار المصانع. (٢) تحديد موعد للزيارة. (٣) مناقشة برنامج الزيارة. (٤) إعداد ملاحظات عن الزيارة يكتبها الطلاب. (٥) تنفيذ الزيارات (انظر برنامج الزيارة أدناه). (٦) جمع ملاحظات الطلاب حول الزيارة وتحليلها وتبادل النتائج مع المصانع.
مثال للبرنامج	(١) كلمة افتتاحية (مندوب من المصنع). (٢) يقدم ممثل المصنع عرضاً توضيحياً لما يلي: - وصف المصنع. - المؤهلات المطلوبة للتوظيف، بما فيها الخلفية الأكاديمية، والدرجات الدراسية، والجدارات، الخ. - المسار الوظيفي بعد التعيين (الوضع الوظيفي والجدارات اللازمة). - بيئة العمل (موقع المصنع، وجود وسيلة لنقل العاملين، وجود سكن للعاملين، وجود كافتيريا للعاملين، الخ). - بنود وظروف العمل (الراتب، العلاوات، عدد ساعات العمل، الإجازات، الخ). - موعد التوظيف القادم (عدد الوظائف في خطة التوظيف، الجدول الزمني للتوظيف، الخ). (٣) جولة في مكان العمل (المصنع/ المكاتب). (٤) جلسة أسئلة وأجوبة. (٥) كلمة ختامية.
دور المدرسة	طلب التعاون والتنسيق مع المصانع (بما في ذلك إجراء ترتيبات النقل بالحافلات، يُمكن عقد مناقشة مع المصنع مسبقاً لطلب إجراء شرح في الجولة يربط بين الجدارات الأربعة والعمل الفعلي الذي يتم القيام به هناك).

المحافظة على نظام الطلاب.	
<p><u>مدارس النظام العام</u>: جميع صفوف الدراسية (نوصي بالصفوف الأولى)</p> <p><u>مدارس النظام المزدوج</u>: جميع صفوف الدراسية (نفس المصنع قد يكون له أعمال مختلفة في الأقسام المختلفة، لذا من الأفضل أن يرى الطلاب مجموعة متنوعة من الأقسام)</p>	<p><b>المشاركون</b></p> <p><b>المستهدفون</b></p>
<p>بعد الزيارة، يجب على الطلاب تقديم ملاحظات عن الزيارة إلى المدرسة. تلخص المدرسة وتطل هذه الملاحظات وتتبادل النتائج مع المصنع. إذا كان نموذج الملاحظات يحتوي على أقسام مختلفة للجدارات الأربعة، فسيساعد ذلك الطلاب على تكوين هدف واضح للزيارة.</p>	<p><b>مهام الطلاب</b></p>
<ul style="list-style-type: none"> <li>• زيارات المعلمين</li> <li>• زيارات الوالدين / أولياء الأمور</li> <li>• جلسات من قبل الخريجين</li> </ul>	<p><b>موضوعات مختلفة</b></p>



البند	الوصف
اسم النشاط	التدريب داخل المصنع
الموضوع	يمارس الطلاب العمل على أرض الواقع لتحقيق تأثير أكبر من زيارات المصانع.
المكان	مواقع الشركة (المصنع/ المكاتب)
مثال للبرنامج	هذا التدريب هو جزء من منهج المدارس ذات النظام المزدوج. بالنسبة للمدارس الثانوية الفنية التقليدية، فإن النموذج المثالي هو أن يكون تدريب داخلي في المصانع ذات صلة بالمهارات التي يتعلمها الطلاب في المدرسة، ولكن إذا لم يكن هناك مصنع قريب مناسب، فسيكون من الجيد تجربة التدريب في الشركات (المصانع/ المكاتب) للقطاعات الصناعية الأخرى أو في المكاتب الحكومية، لأنها تسمح للطلاب على الأقل باكتساب خبرة فيما يتعلق بالجدارات المتعلقة بالسلوك الآمن، التصنيف/ الترتيب/ التنظيف، وإدارة الوقت. يجب أن يكون التدريب حوالي أسبوع واحد إلى أربعة أسابيع، مع تنفيذ تدريب واحد أو اثنين من التدريبات الداخلية سنويًا.
دور المدرسة	طلب التعاون والتنسيق مع المصانع ومراجعة ملاحظات المصانع وتوجيه الطلاب.
المشاركون المستهدفون	<u>مدارس النظام العام</u> : جميع الصفوف الدراسية (يُفضل طلاب السنة الثالثة). <u>مدارس النظام المزدوج</u> : جميع الصفوف الدراسية
مهام الطلاب	تقييم من قبل الطالب: تقييم التدريب من قبل الطلاب في نهاية فترة التدريب داخل المصنع يقدم للمدرسة تفاصيل عن التدريب وما هي الإنجازات التي تحققت، في حين يوفر للمصانع فكرة أوضح عن التحسينات التي يمكن أن تقدمها في قبول المتدربين.



## **اعتبارات للتدريب في المدارس المزدوجة :**

• عند قبول طلبات التحاق الطلاب: إذا لم يكن الطلاب والآباء/ أولياء الأمور على علم بالشروط المختلفة للمصنع (وصف التدريب، عدد الأشخاص الذين سيتم تعيينهم، شروط التدريب، وسيلة الانتقال إلى المصنع، وساعات التدريب)، قد تحدث مشاكل بعد التحاق الطالب بالمدرسة. تلتزم المدرسة ووزارة التربية والتعليم والتدريب الفني بالتأكد من شرح هذه النقاط للطلاب وآبائهم/ أولياء أمورهم عند فتح باب التقدم للالتحاق بالمدرسة. لذلك، يجب على المدرسة الحصول على هذه المعلومات وتقديمها للطلاب والآباء/ أولياء الأمور، أو اتخاذ الترتيبات اللازمة لطلب هذه المعلومات من المصانع.

• التواصل بين المدرسة والمصانع: يجب على المدرسة التواصل مع المصانع قبل بدء التدريب: (أ) توضح المدرسة للمصنع تركيز المدرسة على الجدارات الأربعة في التدريب، (ب) تطلب المدرسة من المصنع أيضًا التركيز على الجدارات الأربعة خلال فترة التدريب.

• متابعة المدرسة للمصانع: بعد بدء التدريب، يزور المعلمون المصانع بانتظام للتحقق من: (أ) أن المصانع تقوم بتدريب الطلاب على الجدارات الأربعة، (ب) لا توجد مشكلة من الطالب من حيث التأخر/ الغياب أو السلوك. إذا تم العثور على أية مشكلات، يتم إجراء مناقشة مع المصانع والآباء/ أولياء الأمور، لإجراء تحسينات فورية. تعمل المدرسة أيضًا مع الوحدة الإقليمية للتحسين. يقوم المعلم بمشاركة نتائج المتابعة مع المصنع والمدرسة، بغض النظر إن كانت النتائج جيدة أو سيئة.

• مشاركة الآباء/ أولياء الأمور: إن فهم وتعاون الآباء/ أولياء الأمور ضروريان لنجاح التدريب. من أجل تعزيز التفاهم المتبادل بين الأطراف المعنية، تعقد اجتماعات دورية (حوالي مرتين في السنة) بحضور المصانع والمدرسة والآباء/ أولياء الأمور والطلاب، الخ. يشمل هذا الاجتماع تبادل الآراء ومناقشة دور الأطراف المعنية (المدرسة، المصانع، الخ)، ودور المدرسة وسياسات التعليم بها، ومخطط المصانع، والجدارات التي تطلبها المصانع في موظفيها، والمؤهلات المطلوبة للعمل، وشروط العمل، والمسار الوظيفي بعد التوظيف، بالإضافة إلى قصص لتجارب طلاب مدرسة مزدوجة، وزيارة المصنع، والأسئلة والأجوبة.

## **جمع معلومات عن المصانع وتقديمها للطلاب**

يمكن للمدارس الحصول على معلومات مختلفة عن المصانع عن طريق تعميق شراكاتها من خلال المثال أعلاه. إن جمع المعلومات وتزويد الطلاب بها من شأنه أن يتيح الفرص للطلاب لإعادة النظر في مسار حياتهم المهنية. من الممكن للطلاب الذين يسعون للدراسة بعد التخرج أن يفكروا في تغيير مهنتهم المرغوبة للعثور على وظيفة. مع وضع ذلك في الاعتبار، فمن المستحسن أن توفر المدارس المعلومات للطلاب.

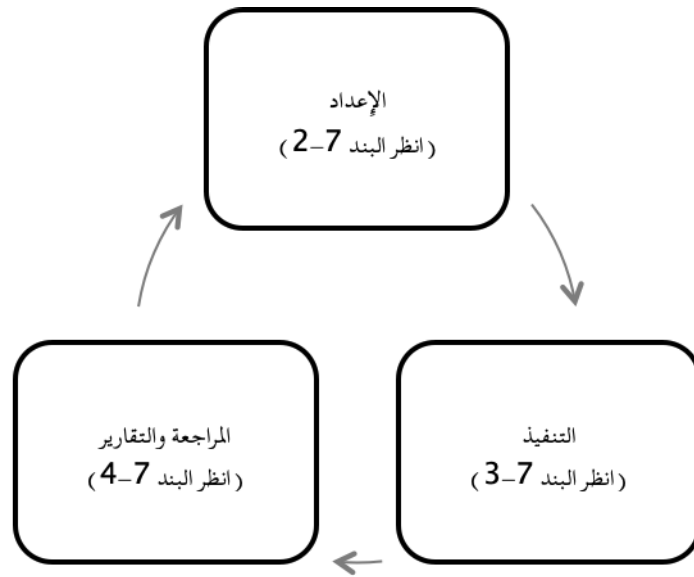


## الفصل ٧ : عملية التنفيذ القياسية لهذا الدليل

يوضح هذا الفصل عملية التنفيذ القياسية التي يجب على المدارس اتباعها لتطبيق التوجيهات في هذا الدليل.

### **١-٧ الخطوط العريضة لعملية التنفيذ**

في السنة الأولى، يتم إجراء الاستعدادات لتطبيق أساليب التعليم في هذا الدليل. بمجرد الانتهاء من الاستعدادات، يتم تطبيق أساليب التدريس، ويتم مراجعة النتائج وتقديم تقرير عنها. في العام التالي، يتم إجراء التحضيرات مرة أخرى بناء على حالة التنفيذ ونتائج السنة الأولى. تكرر المدرسة هذه الدورة كل عام.



يكن مفتاح النجاح في الحصول على فهم ودعم جميع المعلمين، والاتباء/ أولياء الأمور، ووحدة الانتقال لسوق العمل من أجل بناء جهد منسق يشمل جميع الأطراف المعنية بالمدرسة، خلال مرحلة الإعداد في السنة الأولى من التنفيذ. إذا كانت هناك مصانع محلية مجاورة، من الأفضل إشراكها أيضًا.

يقوم مدير المدرسة بتتبع وإدارة التقدم في العمل، جنباً إلى جنب مع الإدارة/ المديرية التعليمية. من أجل إدارة العمل بشكل سليم، يجب على المدرسة إعداد سجلات لنتائج التنفيذ (مثل الوثائق التي تشير إلى أن الأنشطة قد تم تنفيذها، أو الوثائق التي تشير إلى مستوى إنجاز الأنشطة، الخ) وحفظها بعد تنفيذ كل نشاط في العملية. سيكون من المفيد إعداد ملف لإدارة المستجدات في تنفيذ هذا الدليل.

## ٢-٧ الإعداد

يجب الانتهاء من الإعداد قبل أسبوع من بداية العام الدراسي الجديد.

### (١) التدريب داخل المدرسة لضمان فهم المعلمين

خلال السنة الأولى من تقديم هذا الدليل، تنفذ وزارة التربية والتعليم والتعليم الفني تدريب على هذا الدليل. بعد تدريب وزارة التربية والتعليم، يقوم المدير مع المعلمين الذين شاركوا في تدريب الوزارة، بتنفيذ تدريب في المدرسة على هذا الدليل لجميع المعلمين في مدرستهم. اعتباراً من السنة الثانية، يتم عقد التدريب داخل المدرسة لأولئك الذين لم يشاركوا في التدريب، على سبيل المثال المعلمون الجدد، لضمان فهم جميع المعلمين للدليل وقدرتهم التدريس وفقاً لذلك.

### الأشخاص المعنيون وأدوارهم:



المسؤول	الأدوار الرئيسية
مدير المدرسة	✓ الشخص المسؤول عن تنفيذ التدريب داخل المدرسة ✓ تقييم الأنشطة
المعلمون المشاركون في تدريب وزارة التربية والتعليم والتعليم الفني	✓ تنفيذ التدريب داخل المدرسة

### سجلات يتم الاحتفاظ بها:



✓ سجلات التدريب داخل المدرسة.



## مثال لموجز نشاط



البند	التوصية
التاريخ	أغسطس أو سبتمبر
ساعات التدريب القياسية	إجمالي ٩ ساعات (في يومين أو ثلاثة)
اختبار قياس استيعاب المشاركين	يجب القيام به بعد التدريب
المشاركون في التدريب	جميع المعلمين الذين لم يشاركوا في التدريب بعد. إذا كان عدد المشاركين كبيراً للغاية بالنسبة لتدريب واحد، يتم تنفيذ التدريب داخل المدرسة على دفعات أو تقسيم المعلمين إلى مجموعات وتنفيذ عدة تدريبات.
المواد التي يتم توزيعها	تتلقى المدرسة نسخاً مطبوعة للدليل من وزارة التربية والتعليم والتعليم الفني وتوزعها على جميع المعلمين، وتطلب منهم قراءته قبل التدريب (توزع وزارة التربية والتعليم والتعليم الفني الدليل المطبوع ليكون متوافراً في الوقت المناسب للتدريبات داخل المدرسة).

## مثال لبرنامج تدريب



المشاركون	المدة القياسية	الفصل	الجدول
جميع المعلمين	٤٠ دقيقة	الفصل ١	اليوم الأول
	٤٠ دقيقة	الفصل ٥	
	٤٠ دقيقة	الفصل ٦	
	٦٠ دقيقة	الفصل ٧	
	٣٠ دقيقة	اختبار قياس استيعاب المشاركين	
معلمو الدروس النظرية والعملية	٩٠ دقيقة	الفصل ٢	اليوم الثاني
	٤٥ دقيقة	الفصل ٣	
	٤٥ دقيقة	الفصل ٤	
	٣٠ دقيقة	اختبار قياس استيعاب المشاركين	

## التقييم بواسطة المدير:



الرقم	التقييمات	المستهدف	أساليب التقييم
١-١	تاريخ التدريب في المدرسة	تنفيذ التدريب قبل بداية العام الدراسي	مراجعة سجلات التدريب داخل المدرسة
٢-١	النسبة المئوية للمعلمين الذين شاركوا في التدريب	يشارك ٩٠% أو أكثر في التدريب	مراجعة سجلات التدريب داخل المدرسة

## (٢) إعداد الأقسام للدروس العملية

يقوم كل قسم، تحت قيادة رئيس القسم، بتنفيذ الأنشطة الموضحة أدناه. عند إجراء هذه التحضيرات، يجب على الأقسام ملاحظة ما يجب طلبه من الآباء/ أولياء الأمور (الحصول على زي يتوافق مع قواعد زي الورشة أو العناصر المستخدمة في الدروس العملية).

### • الإنتاج وفقاً للمواصفات:

- تحديد عدد المجموعات التي سيتم تقسيم الفصول إليها، مع الأخذ في الاعتبار عدد معلمي الدروس العملية، والمعدات المستخدمة.
- ملاءمة الخطة السنوية للدروس العملية بما يتماشى مع عدد المجموعات.
- وضع خطة تدريس للدروس العملية. تقسيم الدروس العملية إلى خطوات صغيرة، مع التأكد من تضمين خطوات لمراجعة المتطلبات، وتنفيذ العمل، ومراجعة النتائج.

### • السلوك الآمن:

- وضع معايير لزي الورشة وعمل ملصق (بوستر) لعرضه في مكان مرئي في ورشة العمل.
- وضع معايير للسلوك الآمن وعرض موجز له في مكان مرئي في ورشة العمل.
- إنشاء بيئة عمل قياسية (على سبيل المثال، تحديد مناطق أمان منفصلة باستخدام العلامات والأشرطة اللاصقة عند استخدام أدوات و/ أو آلات خطيرة).
- (إذا لزم الأمر) وضع قواعد لزي الورشة الخاص بعمل معين، وبيئة العمل، وكذلك معايير للسلوك الآمن لكل عمل. الحصول على المعدات/ اللوازم الضرورية وإنشاء بيئة مناسبة.

### • التصنيف، والترتيب، والتنظيف

- تنفيذ التصنيف، والترتيب، والتنظيف في ورشة العمل بواسطة المعلمين.
- وضع قواعد للتصنيف/ الترتيب/ التنظيف في ورشة العمل. عرض القواعد داخل ورشة العمل.

## الأشخاص الرئيسيين المعنيين وأدوارهم



المسؤول	الأدوار الرئيسية
مدير المدرسة	✓ إدارة جميع الأنشطة.
رؤساء الأقسام	✓ قيادة الأنشطة للتحضير للدروس العملية.
المعلمون في كل قسم	✓ الاستعداد للدروس العملية فيما يتعلق بالسلوك الآمن والتصنيف، الترتيب، التنظيف. ✓ العمل مع معلمي الدروس النظرية لوضع خطة سنوية (الإنتاج وفقاً للمواصفات) ✓ وضع خطط الدروس العملية (الإنتاج وفقاً للمواصفات)

## التقييم بواسطة المدير



الرقم	بنود التقييم	المستهدف	أساليب التقييم
١-٢	خطة الدروس العملية	إعداد خطة للمجموعات الصغيرة	مراجعة خطة الدروس العملية
٢-٢	الخطط الدراسية للدروس العملية	يتم تقسيم الدروس العملية إلى خطوات صغيرة، تتضمن خطوات لمراجعة المتطلبات، والقيام بالعمل، والتأكد من النتائج.	إعداد عينة من خطط مراجعة الدروس العملية
٣-٢	الزي الأساسي للورشة	عرض ملصق (بوستر) في مكان ظاهر في الورشة	زيارة ورشة العمل
٤-٢	المعايير الأساسية للسلوك الآمن	عرض ملصق (بوستر) في مكان ظاهر في الورشة أو إتاحة كتيب يحتوي على الدليل الإرشادي	زيارة ورشة العمل
٥-٢	معايير بيئة العمل	وضع معايير لبيئة العمل (وضع مخطط وتصميم للممرات تراعي السلامة، الخ)	زيارة ورشة العمل
٦-٢	معايير الزي الخاص بعمل معين وبيئة العمل ومعايير للسلوك الآمن (اختياري)	عرض ملصق (بوستر) في مكان ظاهر في الورشة. توفير بيئة العمل الخاصة بعمل معين.	زيارة ورشة العمل
٧-٢	التنظيف/ الترتيب/ التنظيف في كل ورشة	تنفيذ التنظيف/ الترتيب/ التنظيف	زيارة ورشة العمل
٨-٢	وضع قواعد التنظيف/ الترتيب/ التنظيف	عرض القواعد في مكان ظاهر في الورشة	زيارة ورشة العمل

## سجلات يتم الاحتفاظ بها



تقييم النتائج بواسطة المدير ✓

### (٣) الإعداد لتدريس إدارة الوقت

يأخذ المدير المبادرة في تنفيذ ما يلي:

- وضع معيار لوقت الاستعداد للحصة التالية وإبلاغ الطلاب به.
- توفير نظام يتيح للمدرسين والطلاب معرفة وقت بداية الحصة التالية (على سبيل المثال، ساعات الحائط والجرس وما إلى ذلك).
- إبلاغ الطلاب العواقب المترتبة على عدم اتباع معيار سلوك إدارة الوقت (التأخر).

### الأشخاص المعنيين وأدوارهم



الأدوار الرئيسية	المسؤول
✓ يناقش مع المعلمين ويضع معيارًا لوقت الإعداد للحصة التالية، وإبلاغ المعيار إلى المعلمين.	مدير المدرسة
✓ يناقش مع المدرسين ويقرر كيفية تحديد وقت بدء الحصة، وتوصيله إلى المعلمين.	مدير المدرسة
✓ إبلاغ المعلمين معيار سلوك إدارة الوقت للمدرسة ووزارة التربية والتعليم والتعليم الفني.	مدير المدرسة
✓ تعيين والإشراف على المعلم الذي يقوم بالتحضير تعليمات إدارة الوقت.	مدير المدرسة
✓ إعداد وعرض جدول الحصص.	المعلم المسؤول (أ)
✓ تركيب نظام معرفة الوقت، وصياغة الخطط الإدارية، وتصميم الأدوات الإدارية.	المعلم المسؤول (ب)
✓ إعداد وتنفيذ معايير سلوك الخاصة بإدارة الوقت للطلاب.	الأخصائي الاجتماعي

### **التقييم بواسطة المدير (مثال):**



حيث أن المحتوى يختلف من مدرسة لأخرى، قم بتغيير التقييم حسب الموقف.

الرقم	بنود التقييم	المستهدف	أساليب التقييم
١-٣	عرض الجدول في الفصل	يتم عرض الجدول في كل فصل (وكذلك ورش العمل)	زيارة الفصل
٢-٣	تركيب/ صيانة ساعات الحائط في الفصول	تركيب ساعات الحائط في كل فصل (وكذلك ورش العمل)	زيارة الفصل
٣-٣		الساعات تعرض الوقت بالضبط	زيارة الفصل
٤-٣	إبلاغ معايير سلوك إدارة الوقت للطلاب	الإعداد لإبلاغ معايير سلوك إدارة الوقت للطلاب	الاستماع إلى الأخطائي الاجتماعي

### **سجلات يتم الاحتفاظ بها:**



تقييم النتائج بواسطة المدير ✓

#### (٤) تحديد الأهداف لكل جدارة

يتم تحديد الأهداف والقيم المستهدفة لكل جدارة بحيث يمكن تحديد أثر تحسين طرق التدريس. يُفضل أن تشترك جميع الأقسام في نفس الأهداف والقيم المستهدفة للسنة الأولى. بداية من السنة الثانية، يمكن تغيير الأهداف و/ أو القيم المستهدفة لكل قسم وفقاً لظروفه، ومع ذلك، من المستحسن أن تكون هناك أهداف وقيم مستهدفة مشتركة بقدر الإمكان لأنها تسمح بمقارنة التقدم بين الأقسام. يوصى بالأهداف والقيم المستهدفة التالية للسنة الأولى. يتم عرض الأهداف والقيم المستهدفة والموافقة عليها في اجتماع العاملين بالمدرسة.

#### أهداف السنة الأولى والقيم المستهدفة للجدارات (مثال)

الجدارة	الهدف	القيمة المستهدفة
الإنتاج وفقاً للمواصفات PR	زيادة نسبة الطلاب الذين يحققون مستوى النجاح المنتج النهائي (التمرين) أثناء الدروس العملية	٦٠%
السلوك الآمن SB	زيادة النسبة المئوية للطلاب الذين يلتزمون بمعايير الزي للدروس العملية	٩٠%
التصنيف/ الترتيب/ التنظيف 3S	زيادة النسبة المئوية لتنفيذ التصنيف/ الترتيب/ التنظيف بعد الدروس العملية	١٠٠%
إدارة الوقت TM	زيادة نسبة الطلاب المتواجدين في ورشة العمل عند بداية الدرس العملي	٩٠%



#### الأشخاص المعنيين وأدوارهم



الشخص المسؤول	الأدوار الرئيسية
جميع المعلمين	✓ الموافقة على الأهداف والقيم المستهدفة في اجتماع العاملين بالمدرسة
رؤساء الأقسام	✓ عقد اجتماع مشترك لصياغة الأهداف والقيم المستهدفة ✓ يعرض أحد الممثلين الأهداف والقيم المستهدفة في اجتماع هيئة التدريس للموافقة عليها

### التقييم بواسطة المدير:



الرقم	بنود التقييم	المستهدف	أساليب التقييم
١-٤	تحديد الهدف	تحديد أهداف واقعية	مراجعة محضر اجتماع موظفي المدرسة
٢-٤	تحديد القيم المستهدفة	تحديد قيم مستهدفة واقعية	مراجعة محضر اجتماع موظفي المدرسة

### سجلات يتم الاحتفاظ بها:



✓ محضر اجتماع العاملين.



## (٥) التواصل مع الآباء/ أولياء الأمور

تتطلب "إدارة الوقت" من الطلاب إجراء تحسينات على نمط حياتهم، مما يستدعي تفاهم وتعاون من الوالدين/أولياء الأمور. بالإضافة إلى ذلك، بالنسبة لبعض الأقسام، قد يتضمن "السلوك الآمن" أيضًا تقديم طلبات إلى الوالدين/أولياء الأمور لشراء ملابس عمل معينة تتوافق مع معايير زي الورشة. يتطلب شراء زي الورشة المذكور التواصل مع الوالدين/ أولياء الأمور مسبقًا لمعرفة ما إذا كان ذلك ممكنًا قبل تقديم الطلب، ويرجع ذلك جزئيًا إلى الحاجة لمعرفة الحالة المالية لأسر الطلاب. قد يتم الاتصال بالوالدين/ أولياء الأمور عن طريق مطالبتهم بالذهاب إلى المدرسة لحضور اجتماع للتواصل، أو بإرسال خطابات.

### فيما يلي اقتراح حول ما يجب أن يتضمنه نشاط التواصل.

١) نبذة عن الجدارات الأربعة.
٢) طلبات التعاون مع الآباء/ أولياء الأمور (أمثلة).
أ) الطلبات المتعلقة بإدارة الوقت (دعم بناء روتين يومي لمنع التأخر).
ب) الطلبات المتعلقة بالسلوك الآمن (شراء الملابس التي تتوافق مع معايير زي الورشة).

### الأشخاص المعنيون وأدوارهم:



الشخص المسؤول	الأدوار الرئيسية
الأخصائي الاجتماعي	✓ وضع خطة الشرح للآباء/ أولياء الأمور وتنفيذها.

### سجلات يتم الاحتفاظ بها:



✓ سجلات المدرسة.

### التقييم بواسطة المدير



الرقم	بنود التقييم	المستهدف	أساليب التقييم
١-٥	تاريخ التواصل مع الآباء/ أولياء الأمور.	التواصل مع الآباء/ أولياء الأمور في بداية السنة الدراسية الجديدة (اجتماع التواصل، خطابات، الخ).	مراجعة سجلات المدرسة
٢-٥	عدد الآباء/ أولياء الأمور الذين تم التواصل معهم	التواصل مع ٧٠% أو أكثر من الآباء/ أولياء الأمور.	مراجعة سجلات المدرسة

## ٣-٧ التنفيذ

يتم التنفيذ على مدار الفصل الدراسي.

### (١) جلسة تقديمية للطلاب عن الدروس العملية

يقوم كل قسم بعقد جلسة تقديمية في أقرب وقت ممكن بعد بدء العام الدراسي، وقبل بدء الدروس العملية. تُعقد هذه الجلسة أساساً لطلاب السنة الأولى، ولكن يجب أن يحضرها طلاب السنة الثانية والثالثة في السنة الأولى للتنفيذ. تتضمن الجلسة ما يلي:

- يتم شرح الجدارات الأربعة وأهميتها بالتفصيل.
- شرح قواعد زي الورشة ومعايير السلامة، مع معلومات حول ما يجب ارتداؤه للدروس العملية.
- يتم شرح مفهوم الالتزام بالمواعيد، وعواقب التأخير للطلاب.

### الأشخاص المعنيون وأدوارهم:



الشخص المسؤول	الأدوار الرئيسية
المعلمون في كل قسم	✓ وضع خطة التوجيه وتنفيذها.

### سجلات يتم الاحتفاظ بها:



✓ سجلات الدروس.

### التقييم بواسطة المدير:



الرقم	بنود التقييم	المستهدف	أساليب التقييم
١-١	عقد اجتماع التواصل	عقد اجتماع التواصل قبل بداية الدروس العملية	مراجعة سجلات الفصل

## (٢) تنفيذ الدروس العملية المحسنة

تنفيذ المحتوى الموصوف في الفصول ٢ إلى ٤ في الدروس العملية. تنفيذ المحتوى الموصوف في الفصل ٥ في المدرسة كلها.

### الأشخاص المعنيون وأدوارهم:



الأدوار الرئيسية	المسؤول
✓ تقديم الدروس العملية المحسنة	المعلمون في كل قسم

### سجلات يتم الاحتفاظ بها:



- ✓ خطة الدروس العملية.
- ✓ سجلات الدروس العملية (سجلات ملابس العمل، وتنفيذ التصنيف/ الترتيب/ التنظيف، إلخ).

## ٤-٧ المراجعة وإعداد التقارير

يتم تنفيذ المراجعة وإعداد التقارير أيضاً طوال مدة الفصل الدراسي.

### (١) قياس / تسجيل القيم المستهدفة للجدارات

يحتفظ معلم الدروس العملية بسجل للأهداف المحددة والقيم المستهدفة لكل جدارة. النموذج الموصى به للسجل موضح أدناه.

#### مثال في مدرسة النظام العام:



المراجعة مرتين في السنة.

القيمة المُقاسة		القيمة المستهدفة	الهدف	الجدارة
مارس	أكتوبر			
		٦٠%	زيادة النسبة المئوية للطلاب الذين يحققون مستوى النجاح في المنتج النهائي (التمرين) أثناء الدروس العملية .	الجدارة: الإنتاج وفقاً للمواصفات
		٩٠%	زيادة النسبة المئوية للطلاب الذين يتبعون معايير الزي للدروس العملية.	الجدارة: السلوك الآمن
		١٠٠%	زيادة النسبة المئوية لتطبيق التصنيف / الترتيب / التنظيف بعد الدروس العملية.	الجدارة: التصنيف / الترتيب / التنظيف
		٩٠%	زيادة نسبة الطلاب المتواجدين في ورشة العمل في بداية الدرس العملي.	الجدارة: إدارة الوقت

## مثال في مدرسة النظام المزدوج:



المراجعة مرتين في السنة (فوراً بعد بداية حصة الدرس العملي وقبل نهاية الدرس العملي).

القيمة المُقاسة		القيمة المستهدفة	الهدف	الجدارة
نهاية الدرس	بداية الدرس			
		60%	زيادة النسبة المئوية للطلاب الذين يحققون مستوى النجاح في المنتج النهائي (التمرين) أثناء الدروس العملية .	الجدارة: الإنتاج وفقاً للمواصفات
		90%	زيادة النسبة المئوية للطلاب الذين يتبعون معايير الزي للدروس العملية.	الجدارة: السلوك الآمن
		100%	زيادة النسبة المئوية لتطبيق التصنيف / الترتيب/ التنظيف بعد الدروس العملية.	الجدارة: التصنيف/ الترتيب/ التنظيف
		90%	زيادة نسبة الطلاب المتواجدين في ورشة العمل في بداية الدرس العملي.	الجدارة: إدارة الوقت

## معدل تكرار عملية القياس:

الغرض من قياس وتسجيل القيم المستهدفة هو التقييم الذاتي للمدرسة. من الأفضل قياس وتسجيل مستويات الجدارة في كل فصل من أجل فهم درجة جدارة الطالب بشكل أكثر دقة، ولكن من الممكن أيضًا اختيار الفصول بشكل عشوائي في كل قسم.

### القياس بواسطة العينات العشوائية (مثال)



في قسم الميكانيكا في أحد المدارس، تم اختيار 6 دروس بشكل عشوائي في أكتوبر لقياس النسبة المئوية للطلاب الذين يتبعون قواعد الزي في الدروس العملية.

الصف والفصل	تاريخ القياس	عدد الحضور (A)	عدد الحضور الذين يرتدون زي العمل (B)	القيمة المقاسة (B/A)
الصف ١ - الفصل ١	٣ أكتوبر	١٥	١٠	٦٧%
الصف ١ - الفصل ٢	٤ أكتوبر	١٨	١٨	١٠٠%
الصف ٢ - الفصل ١	٧ أكتوبر	٢٠	١٥	٧٥%
الصف ٢ - الفصل ٢	٣ أكتوبر	١٧	١٥	٨٨%
الصف ٣ - الفصل ١	١٠ أكتوبر	٢٠	١٥	٧٥%
الصف ٣ - الفصل ٢	٣ أكتوبر	١٨	١٨	١٠٠%
الإجمالي				٨٤%

في وقت لاحق، يتم تجميع السجلات داخل القسم وعرضها في اجتماع موظفي المدرسة من قبل ممثل القسم.

### الأشخاص المعنيون وأدوارهم:



المسؤول	الأدوار الرئيسية
رئيس القسم	✓ تجميع سجلات الجدارة لكل قسم
معلم الدروس العملية في كل قسم	✓ قياس وتسجيل كل جدارة في الدرس

### سجلات يتم الاحتفاظ بها:



سجلات الجدارة. ✓

### التقييم بواسطة المدير:



الرقم	بنود التقييم	المستهدف	أساليب التقييم
١-١	مراجعة سجلات كل جدارة	الاحتفاظ بسجلات كل جدارة	مراجعة السجلات

## (٢) تقييم الدروس العملية

في هذا الدليل، يتم تقييم الدروس العملية من منظور ما إذا كانت الدروس قد أجريت وفقاً لخطة سير الدرس العملي. يتم إجراء التقييم من خلال نموذج تقييم الدروس العملية (تقييم عمل المعلمين). ليس من الضروري تقييم جميع الدروس. يتم تقييم واحد أو أكثر من الدروس العملية لكل قسم خلال العام، ليتم استخدامها لتوفير التوجيه للمعلمين.

### الأشخاص المعنيون وأدوارهم:



المسؤول	الأدوار الرئيسية
رئيس القسم	✓ تقييم الدروس العملية في القسم التابع له وتقديم التوجيه للمعلمين لعمل التحسينات.

### سجلات يتم الاحتفاظ بها:



✓ نموذج تقييم الدرس العملي.

### التقييم بواسطة المدير:



الرقم	بنود التقييم	المستهدف	أساليب التقييم
١-٢	نموذج تقييم الدرس العملي	تنفيذ تقييم الدرس العملي لكل معلم مرة واحدة كل عام على الأقل	مراجعة السجلات



## نموذج تقييم الدرس العملي (تقييم عمل المعلم)

### معلومات الدرس

اسم	اسم المديرية التعليمية		
اسم القسم	اسم الإدارة التعليمية		
الصف دراسي	تاريخ التقييم		
اسم المعلم	اسم منفذ التقييم		

### ١- أخذ الغياب في بداية الدرس العملي

الرقم	الجدارة	بنود التقييم	نعم/ لا	جودة الإجراءات (صحة الإجراءات, الخ)
١-١	إدارة الوقت	يقدم المعلم تنبيه للطلاب المتأخر وفقاً للمعايير, ويسأل عن سبب التأخر. يتم إعطاء التعليمات حسب الضرورة.		
٢-١	السلوك الآمن	يراجع المعلم ما يرتديه الطلاب. إذا كان هناك أي طالب لا يتبع قواعد زي الورشة, يقوم المعلمون بتصحيح الوضع في الحال.		

## ٢- بعد التقسيم إلى مجموعات, تقديم الشرح المبدئي

الرقم	الجدارة	بنود التقييم	نعم/ لا	جودة الإجراءات (صحة الإجراءات, الخ)
١-٢	الإنتاج وفقاً للمواصفات	(مراجعة المتطلبات). يشرح المعلم ما يلي عدة مرات حتى يفهم الطلاب, ويعرض عينات أيضاً حسب الضرورة. <ul style="list-style-type: none"> <li>• العمل الكلي والعمليات الأصغر في الدرس</li> <li>• الهدف من العمل</li> <li>• المتطلبات (المواصفات, مخططات الدوائر, وما إلى ذلك)</li> <li>• النظرية الأساسية</li> <li>• أسماء ووظائف الآلات / المعدات والأدوات</li> </ul>		
٢-٢	السلوك الآمن	يوضح المعلم معايير السلامة الخاصة بالعمل في الدرس العملي.		
٣-٢	التصنيف/ الترتيب/ التنظيف	يطلب المعلم من الطلاب جمع الأدوات/ المكونات / المواد الخام اللازمة للعمل في الدرس.		

### ٣- أثناء العمل

جودة الإجراءات (صحة الإجراءات, الخ)	نعم / لا	بنود التقييم	الجدارة	الرقم
		يتجول المعلم في جميع أنحاء الغرفة للتحقق مما إذا كان الطلاب يقومون بعملهم بشكل صحيح. إذا لم يكن الأمر كذلك، يوجه المعلم الطالب عدة مرات حسب الحاجة حتى يتمكن الطالب من القيام بالعمل بشكل صحيح.	الإنتاج وفقاً للمواصفات (القيام بالعمل)	١-٣
		يقوم المعلم بتوجيه الطلاب لكي يراجعوا بشكل متكرر ما إذا كانت نتائج عملهم تفي بالمتطلبات. بناءً على تلك المراجعة، إذا كان العمل لا يفي بالمتطلبات، يقوم المعلم بتوجيه الطالب لمراجعة المتطلبات مرة أخرى وإعادة العمل.	الإنتاج وفقاً للمواصفات (التأكد من النتائج)	٢-٣
		يتحقق المعلم من قيام كل طالب بعمله من خلال اتباع معايير الأمن والسلامة. إذا تبين أن هناك طالب يقوم بعمله بطريقة غير آمنة، أبلغ الطالب بذلك ووضح له كيف يتم ذلك بشكل صحيح.	السلوك الآمن	٣-٣
		يتحقق المعلم من قيام كل طالب بعمله من خلال اتباع معايير الـ (S٣) التصنيف/ الترتيب/ التنظيف. إذا تبين أن الطالب لا يقوم بعمله بطريقة S٣، أبلغ الطالب بذلك ووضح له كيف يتم ذلك بشكل صحيح.	التصنيف/ الترتيب/ التنظيف	٤-٣

#### ٤- بعد العمل

جودة الإجراءات (صحة الإجراءات, الخ)	نعم / لا	بنود التقييم	الجدارة	الرقم
		يشرح المعلم ملخص الدرس العملي لليوم. إذا كان هناك مثال لوقوع خطأ كبير, يقوم المعلم بإبلاغه إلى جميع الطلاب ويشجعهم على التفكير في سبب حدوث هذا الخطأ.	الإنتاج وفقاً للمواصفات	١-٤
		يوجه المعلم الطلاب إلى تنظيف الأدوات والآلات / المعدات لإزالة أي غبار أو بقع, وإعادتهم إلى مواقع التخزين المخصصة. يوجه المعلم الطلاب إلى تنظيف ورشة العمل وفقاً لقواعد التنظيف.	التصنيف / الترتيب / التنظيف	٢-٤
		إذا كان هناك أي عمل تم إجراؤه بطريقة قد تتسبب في حدوث خطر, فإن المعلم يقدم ملاحظات للطلاب حول العمل بأمان للمحتوى الذي تم في الدرس.	السلوك الآمن	٣-٤

### (٣) تبادل المعلومات في اجتماعات العاملين

لكي يكتسب الطلاب الجدارات الأربعة، يجب على جميع المعلمين في المدرسة العمل معًا. لهذا السبب، ينبغي عقد اجتماعات للعاملين بالمدرسة بشكل أكثر تكراراً لمراجعة الإنجازات. يوصى بعقد اجتماعات للعاملين بالمدرسة يشمل المواضيع المدرجة أدناه شهرياً، ومع ذلك، يمكن إجراء تغييرات وفقاً للوضع في كل مدرسة.

#### مثال لجدول أعمال اجتماع العاملين



التاريخ	جدول الأعمال
سبتمبر (أيام قليلة قبل بداية العام الدراسي)	<ul style="list-style-type: none"> <li>✓ يشرح المدير أهمية تقديم الدليل الإرشادي لجميع المعلمين.</li> <li>✓ يعلن المدير أن معالجة التأخير وتصنيف النفايات ستتم بتكاتف جميع العاملين.</li> <li>✓ يعرض رئيس كل قسم حالة الإعداد للدروس العملية في القسم.</li> <li>✓ يقدم الأخصائي الاجتماعي تقريراً عن حالة التواصل مع الآباء/ أولياء الأمور.</li> </ul>
أكتوبر	<ul style="list-style-type: none"> <li>✓ يعرض ممثل من كل قسم نتائج الجلسات التعريفية للطلاب.</li> </ul>
نوفمبر	<ul style="list-style-type: none"> <li>✓ يعرض ممثل من كل قسم التقدم المحرز في تعليم ٤ جدارات والأنشطة التي تقام بالشراكة مع المصنع.</li> </ul>
ديسمبر	<ul style="list-style-type: none"> <li>✓ كما جاء أعلاه.</li> </ul>
يناير	<ul style="list-style-type: none"> <li>✓ يقدم ممثل من كل قسم نظرة عامة وتقرير حالة للفصل الدراسي الأول حول تعلم الطلاب فيما يتعلق بالجدارات الأربعة. كما يتم تقديم خطط التحسين حسب الضرورة.</li> <li>✓ يقدم ممثل من كل قسم تقرير حالة عن الأنشطة التي تمت في شراكة مع المصنع.</li> </ul>
فبراير	<ul style="list-style-type: none"> <li>✓ يعرض ممثل من كل قسم التقدم المحرز في تدريس الجدارات الأربع والأنشطة التي تقام بالشراكة مع المصنع.</li> </ul>
مارس	<ul style="list-style-type: none"> <li>✓ كما جاء أعلاه.</li> </ul>
أبريل	<ul style="list-style-type: none"> <li>✓ يقدم ممثل من كل قسم عرضاً عامًا وتقريراً عن حالة تعلم الطلاب فيما يتعلق بالجدارات الأربعة. كما يتم تقديم خطط التحسين حسب الضرورة.</li> </ul>

## الأشخاص المعنيون وأدوارهم



الأدوار الرئيسية	المسؤول
✓ الدعوة لاجتماع العاملين	المدير
✓ المشاركة في اجتماع العاملين وإعداد التقارير	المعلمين



## سجلات يتم الاحتفاظ بها:

✓ محضر اجتماع العاملين (أو جدول الأعمال).

## **(٤) رفع التقارير إلى الإدارة/ المديرية التعليمية/ وزارة التربية والتعليم والتعليم الفني**

في شهر أبريل من كل عام، يتم إرسال تقرير سنوي عن نتائج السنة الدراسية إلى الإدارة/ المديرية التعليمية/ وزارة التربية والتعليم والتعليم الفني. نموذج التقرير الموصى به موضح أدناه.

مثال لنموذج تقرير الإنجاز المرسل إلى الإدارة/ المديرية التعليمية/ وزارة

التربية والتعليم

م

مثال

تقرير الإنجاز: العام الدراسي ٢٠١٨ / ٢٠١٩

تاريخ تقديم التقرير:

اسم المدرسة:

(١) النتيجة:

الجدارة	الهدف	القيمة المستهدفة	القيمة المقاسة
الإنتاج وفقاً للمواصفات	زيادة النسبة المئوية للطلاب الذين يحققون مستوى النجاح في المنتج النهائي (التمرين) أثناء الدروس العملية.	%٦٠	
السلوك الآمن	زيادة النسبة المئوية للطلاب الذين يتبعون قواعد الزي للدروس العملية	%٩٥	
التصنيف/ الترتيب/ التنظيف (3S)	زيادة نسبة التنظيف التي تتم بعد الدروس العملية	%١٠٠	
إدارة الوقت	زيادة النسبة المئوية للطلاب المتواجدين في ورشة العمل في بداية الدرس العملي.	%٩٥	

(٢) المشكلات:

(٣) خطة حل المشكلات:

نهاية التقرير

## الأشخاص المعنيون وأدوارهم



الأدوار الرئيسية	المسؤول
✓ اعتماد التقارير وتقديمها إلى الإدارة/ المديرية التعليمية/ وزارة التربية والتعليم.	المدير
✓ كتابة التقارير	الأشخاص المسؤولين عن كتابة التقارير

## سجلات يتم الاحتفاظ بها:



✓ التقارير.

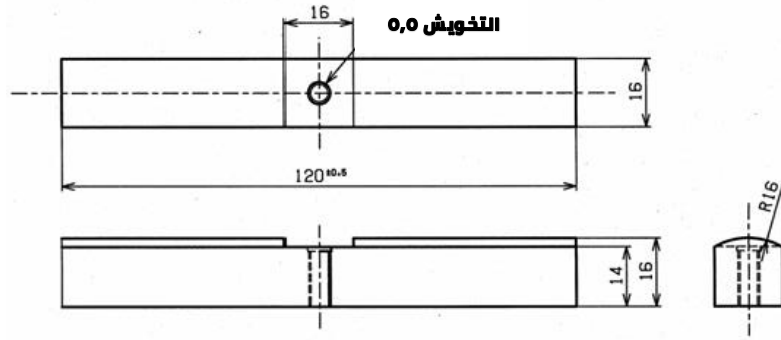


# ملحق دليل الإرشادات

## الموضوع: التشطيب اليدوي

(١) توضيح:

في هذه العملية، يتم إنتاج مثقلة الورق (كما هو موضح في الرسم أدناه) باستخدام مبراد يدوية ومثقاب.



(٢) طريقة العمل:

رقم العملية	العملية	مدة التنفيذ المتوقعة
العملية ١	تشطيب الحواف	٣ ساعات
العملية ٢	تشطيب خشن للسطح العلوي	٣ ساعات
العملية ٣	عمل مساحة مسطحة للمقبض في السطح العلوي	٣ ساعات
العملية ٤	الثقب	٣ ساعات
العملية ٥	القلوطة Tapping	٣ ساعات
العملية ٦	التخويش	٣ ساعات
العملية ٧	تشطيب السطح	٣ ساعات
	الإجمالي	٢١ ساعة

توضح الصفحات التالية خطط دروس للعمليات الأولى والثانية كمثال.

العملية رقم ١: تشطيب السطح الخارجي والحواف

المدة	٣ ساعات
المواصفات	<ul style="list-style-type: none"> <li>✓ تنعيم الحافة</li> <li>✓ عمل الحافة بزاوية ٩٠ درجة</li> <li>✓ عمل الأبعاد بالقياسات التالية <math>120 \pm 0.5</math> ملم.</li> </ul>
الأدوات والمواد	<ul style="list-style-type: none"> <li>✓ منجلة تزجة ولقم فك المنجلة.</li> <li>✓ مبرد مبطط.</li> <li>✓ الزاوية القائمة.</li> <li>✓ فرشاة سلك.</li> <li>✓ القدمة ذات الورنية.</li> <li>✓ قدم صلب (SS400)</li> </ul>
معايير الأداء	<ul style="list-style-type: none"> <li>✓ قراءة وفهم الأطوال ونسبة التفاوت الموضحة في الرسم الميكانيكي.</li> <li>✓ تحديد اسم كل جزء، والأنواع المختلفة، وحجم أسنان المبارد اليدوية.</li> <li>✓ معرفة الطريقة الصحيحة لبرد المعادن.</li> <li>✓ فحص الزاوية القائمة باستخدام الزاوية القائمة.</li> <li>✓ فحص الأبعاد باستخدام القدمة ذات الورنية.</li> </ul>

السلوك المستهدف للطلاب	كيف يقدم المعلم التوجيهات (*)	طريقة تقييم الطالب
<ul style="list-style-type: none"> <li>✓ فهم طريقة العمل بالكامل.</li> <li>✓ فهم العملية رقم ١.</li> </ul>  <p>(الحواف قبل العمل)</p>	<ul style="list-style-type: none"> <li>✓ شرح طريقة العمل بالكامل عن طريق: (١ عرض المنتج النهائي (مثقلة الورق) للطلاب، (٢ شرح مختصر للعمليات من ١ حتى ٧.</li> <li>✓ شرح العملية ١ لجعل الطلاب يفهمون مواصفات العملية ١ وعرض الحواف قبل وبعد التشطيب، وكذلك شرح خطوات العمل.</li> </ul>	<p>قم بمراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم.</p>

		 <p>(الحواف بعد العمل)</p>
<p>قم بمراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم.</p>	<p>اشرح ما يلي:</p> <ul style="list-style-type: none"> <li>✓ وظيفة واسم كل جزء من المنجلة التزجة ولقم فك المنجلة.</li> <li>✓ وظيفة واسم كل جزء وأنواع وحجم أسنان المبارد المبطة.</li> <li>✓ وظيفة الفرشاة السلك.</li> <li>✓ وظيفة واسم كل جزء من الزاوية القائمة.</li> <li>✓ وظيفة واسم كل جزء من القدمة ذات الورنية.</li> </ul>	<p>فهم النظرية المتعلقة بالعملية رقم ا.</p>
<p>قم بمراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم.</p>	<p>اعرض طرق العمل الموضحة أدناه:</p> <ul style="list-style-type: none"> <li>✓ كيفية استخدام المنجلة التزجة ولقم فك المنجلة.</li> <li>✓ أساسيات استخدام المبرد اليدوي ووضع الجسم أثناء الاستخدام.</li> <li>✓ كيفية تنظيف المبرد المبطن باستخدام الفرشاة السلك.</li> <li>✓ كيفية فحص الزاوية القائمة باستخدام الزاوية القائمة.</li> <li>✓ كيفية استخدام القدمة ذات الورنية.</li> </ul>	<p>الانتباه إلى شرح المعلمين بعناية والفهم الكامل لطريقة العمل في العملية رقم ا.</p>
<p>✓ هل التمرين مثبت جيداً في المنجلة؟</p> <p>✓ هل يؤدي الطلاب أساسيات الاستخدام السليم للمبرد اليدوي والوضع السليم</p>	<p>انتقل من طالب لآخر وكرر التوجيهات.</p>	<p>القيام بالعمل: تشطيب السطح والحواف:</p> <ul style="list-style-type: none"> <li>✓ قم بتثبيت المثقلة جيداً في المنجلة التزجة.</li> <li>✓ قم بعملية البرد بطريقة</li> </ul>

<p>للجسم أثناء استخدام المبرد؟ ✓ هل يقوم الطلبة بالتنظيف السليم للمبرد المبطط باستخدام الفرشاة السلك؟</p>		<p>سليمة. ✓ قم بتنظيف المبرد المبطط بطريقة سليمة باستخدام الفرشاة السلك.</p>
<p>✓ الزاوية القائمة: هل يستطيع الطلبة استخدام الزاوية القائمة بطريقة سليمة للتحقق من عمودية الزوايا؟ ✓ الطول ونسبة التفاوت: هل يستطيع الطلاب أن يقيسوا بدقة باستخدام القدمة ذات الورنية؟ ✓ النعومة: هل يستطيع الطلاب فحص درجة نعومة السطح عن طريق النظر؟</p>	<p>انتقل من طالب لآخر وكرر التوجيهات. ✓ أخبر الطلاب بالتقييم النهائي (إذا كانت زوايا الأسطح والحواف صحيحة، وناعمة، وفي حدود نسبة التفاوت المسموح بها في الأبعاد). ✓ أخبر الطلاب إذا لم يتم استيفاء أحد المتطلبات وأعد العمل مرةً أخرى.</p>	<p><u>التأكد من النتائج</u>: تأكد إذا كانت نتيجة العمل تحقق المطلوب. ✓ استخدم الزاوية القائمة للتأكد من عمودية الزوايا. ✓ قم بالقياس باستخدام القدمة ذات الورنية. ✓ افحص نعومة السطح من خلال النظر.</p>

العملية رقم ٢: التشطيب الخشن للسطح العلوي

المدة	٣ ساعات
المطلوب	<ul style="list-style-type: none"> <li>✓ عمل سطح منحنى R16</li> <li>✓ تنعيم السطح المستدير</li> </ul>
الأدوات والمواد	<ul style="list-style-type: none"> <li>✓ أدوات الشنكار (ورنية الارتفاعات, زهرة استواء, مسند حرف ٧, طلاء الشنكرة).</li> <li>✓ الضبعة.</li> <li>✓ منجلة تزجة, لقم فك المنجلة.</li> <li>✓ مبرد مبططة.</li> <li>✓ فرشاة سلك.</li> </ul>
معايير الأداء	<ul style="list-style-type: none"> <li>✓ قراءة وفهم أبعاد التشطيب الخشن الموضحة في الرسم الميكانيكي.</li> <li>✓ شنكرة قطعة العمل باستخدام ورنية الارتفاعات.</li> <li>✓ تعلم الطريقة السليمة لتشطيب السطح المستدير باستخدام المبرد المبططة.</li> <li>✓ فحص نصف القطر للجزء المشطب باستخدام الضبعة.</li> </ul>

السلوك المستهدف للطالب	كيف يقدم المعلم التوجيهات (*)	طريقة تقييم الطالب
فهم العملية رقم ٢	<ul style="list-style-type: none"> <li>✓ شرح العملية رقم ٢ (المواصفات, خطوات العمل).</li> </ul>	<p>قم بمراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم.</p>
فهم النظرية المتعلقة بالعملية رقم ٢	<ul style="list-style-type: none"> <li>شرح ما يلي:</li> <li>✓ وظيفة واسم كل جزء من منجلة التزجة ولقم فك المنجلة.</li> <li>✓ وظيفة واسم كل جزء وأنواع, وحجم أسنان المبرد المبطط.</li> <li>✓ وظيفة الفرشاة السلك.</li> <li>✓ الغرض من أدوات الشنكرة واسم كل أداة.</li> <li>✓ وظيفة واسم كل جزء من الضبعة.</li> </ul>	<p>قم بمراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم.</p>
ملاحظة عرض المعلمين بعناية والفهم الكامل لطريقة العمل في العملية رقم ٢.	<ul style="list-style-type: none"> <li>قم بعرض طرق العمل المذكورة أدناه:</li> <li>✓ كيفية استخدام المنجلة التزجة ولقم فك المنجلة.</li> </ul>	<p>قم بمراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم أثناء العرض.</p>

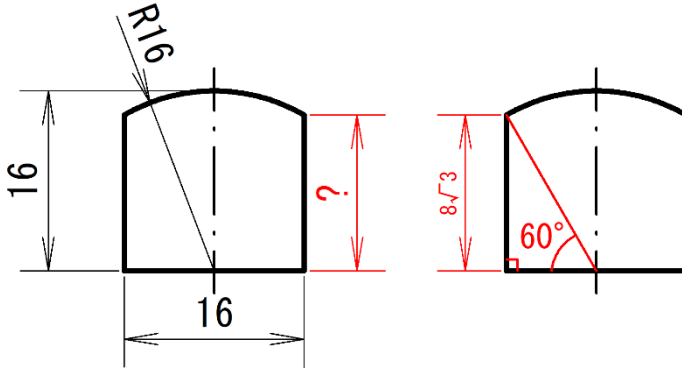
	<p>✓ أساسيات استخدام المبرد اليدوي ووضعية الجسم عند الاستخدام.</p> <p>✓ كيفية تنظيف المبرد المبطن باستخدام الفرشاة السلك.</p> <p>✓ كيفية تشطيب السطح المستدير باستخدام مبرد مبطن.</p> <p>✓ كيفية استخدام أدوات الشنكرة.</p> <p>✓ كيفية استخدام الضبعة.</p>	
<p>✓ يتم وضع طلاء الشنكرة في المكان المناسب لعمل الشنكرة.</p>	<p>انتقل من طالب لآخر وكرر التوجيهات.</p>	<p>القيام بالعمل: وضع طلاء الشنكرة في المكان المناسب المراد تمييزه.</p> 
<p>✓ هل يستخدم الطلاب أدوات الشنكرة بطريقة سليمة ويقومون بتمييز المكان الصحيح؟</p>	<p>انتقل من طالب لآخر وكرر التوجيهات.</p>	<p>القيام بالعمل: وضع المادة على زهرة الاستواء والقيام بالطلاء ٢ ملم من الحافة على السطح العلوي باستخدام ورنية الارتفاعات.</p>
<p>✓ هل التمرين مثبت جيداً في منجلة التزجة؟</p> <p>✓ هل ينفذ الطلاب أساسيات الاستخدام السليم للمبرد اليدوي ووضعية الجسم السليمة أثناء الاستخدام؟</p> <p>✓ هل يقوم الطلبة بالتنظيف السليم للمبرد المبطن باستخدام الفرشاة السلك؟</p>	<p>انتقل من طالب لآخر وكرر التوجيهات.</p>	<p>القيام بالعمل: عمل سطح منحنى باستخدام مبرد مبطن.</p> <p>✓ قم بتثبيت القطعة جيداً في منجلة التزجة.</p> <p>✓ راقب خط الشنكرة أثناء تدوير السطح العلوي باستخدام مبرد مبطن.</p> <p>✓ استخدم مبرد مبطن لتشطيب السطح المستدير الخارجي مع قياس نصف القطر باستخدام الضبعة.</p>

		 <p>✓ قم بتنظيف المبرد المببط باستمرار باستخدام الفرشاة السلك.</p>
<p>✓ السطح المستدير: هل يستطيع الطلاب قياس نصف القطر باستخدام الضبعة بطريقة صحيحة؟ ✓ النعومة: هل يستطيع الطلاب فحص درجة نعومة السطح عن طريق النظر؟</p>	<p>انتقل من طالب لآخر وكرر التوجيهات. ✓ أخبر الطلاب بالتقييم النهائي (عمل سطح مستدير R16, وتنعيم السطح المستدير). ✓ أخبر الطلاب إذا لم يتم استيفاء أحد المتطلبات وأعد العمل مرةً أخرى.</p>	<p><u>التأكد من النتائج</u>: تأكد إذا كانت نتيجة العمل تستوفي المواصفات. ✓ قم بقياس نصف القطر باستخدام الضبعة بشكل سليم. ✓ قم بفحص نعومة السطح من خلال النظر.</p>

\*: السطور التي تحتها خط في الجدول أعلاه تم تدريسها بالفعل في عملية سابقة. يقوم المعلمون بتعديل هذا الجزء وفقاً لمستوى فهم الطلاب. يمكن أيضاً تجاوز هذا الشرح إذا كان الطلاب يفهمونه جيداً.



نصائح لتحسين التوجيهات: كيف يمكن حساب قيمة  $\theta$  ملم؟



في المثلث القائم الزاوية, تكون نسبة الطول هي:

ضلع القاعدة: الضلع المائل: ضلع الارتفاع =  $1 : \sqrt{3} : 2$

## التقييم الذاتي بواسطة الطلاب

المدة: ١٠ دقائق

إرشادات التقييم:

- ١- هذا التقييم الذاتي يختص بكامل العمل (من العملية ١ حتى العملية ٧).
- ٢- يرجى الرجوع إلى استمارة التقييم الذاتي هذه للاسترشاد بها عند القيام بالعمل. حاول أن تكون جميع الإجابات "نعم".
- ٣- بعد الدرس العملي، قم بملء الاستمارة بنفسك.

السلوك الآمن، إدارة الوقت، التصنيف/ الترتيب/ التنظيف 3S

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	السلوك الآمن: أنا أتبع معايير زري الورشة.			
٢	السلوك الآمن: أنا أتبع معايير الأمن والسلامة .			
٣	إدارة الوقت: أنا لم أتأخر عن الحضور في الفصل.			
٤	التصنيف/ الترتيب/ التنظيف 3S: لقد قمت بإعادة الأدوات/ المواد التي استخدمتها إلى مكانها الصحيح.			
٥	التصنيف/ الترتيب/ التنظيف 3S: لقد حافظت دائماً على طاولة العمل مرتبة ونظيفة جيداً بعد استخدامها.			

الإنتاج وفقاً للمواصفات (النظري)

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	فهم أسماء، وأنواع، واستخدامات المبارد اليدوية.			
٢	فهم أسماء كل جزء، وأنواع، وحجم أسنان المبارد المبططة.			

			قراءة وفهم أبعاد التشطيب الخشن الموضحة في الرسم الميكانيكي.	٣
			فهم متطلبات القلوطة الموضحة في الرسم الميكانيكي.	٤
			قراءة وفهم أبعاد الثقب الموضحة في الرسم الميكانيكي.	٥
			قراءة وفهم الأطوال والتفاوت الموضح في الرسم الميكانيكي.	٦
			فهم مكان التخويش الموضح في الرسم الميكانيكي.	٧
			قراءة وفهم أبعاد مكان المقبض على السطح العلوي الموضح في الرسم الميكانيكي.	٨
			فهم أسماء وأنواع مجموعة المبارد.	٩
			فهم الاستخدامات والأنواع المختلفة وأحجام الأسنان لقماش الصنفرة.	١٠

الإنتاج وفقاً للمواصفات (العملي)

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	فحص نصف قطر التشطيب باستخدام الضبعة.			
٢	فحص أبعاد المساحة المسطحة باستخدام القدمة ذات الورنية.			
٣	شكرة قطعة العمل باستخدام ورنية الارتفاعات.			
٤	تعلم طريقة استخدام ذكر القلاووظ .			
٥	تعلم الطريقة الصحيحة لبرد المعادن.			
٦	تعلم الطريقة الصحيحة لاستخدام مجموعة المبارد.			
٧	تعلم طريقة استخدام المثقاب.			
٨	تحقق من عمودية الزاوية باستخدام الزاوية القائمة.			
٩	تعلم المهارات الأساسية لاستخدام قماش الصنفرة.			

## استمارة تقييم الطالب بواسطة المعلم

✓ تشمل استمارة التقييم هذه العمليات من رقم ١ حتى رقم ٧.

	السنة الدراسية	الفصل	
	الاسم	القسم	
	اليوم	عدد الحضور	
	رقم الدرس	عنوان الدرس	

السلوك الآمن، إدارة الوقت، التصنيف/ الترتيب/ التنظيف 3S

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	السلوك الآمن: اتبع الطالب معايير زي الورشة .			
٢	السلوك الآمن: اتبع الطالب معايير الأمن والسلامة .			
٣	إدارة الوقت: لم يتأخر الطالب عن الحضور في الفصل.			
٤	التصنيف/ الترتيب/ التنظيف: أعاد الطالب الأدوات/ المواد التي استخدمها إلى مكانها الصحيح.			
٥	التصنيف/ الترتيب/ التنظيف: حافظ الطالب دائماً على طاولة العمل مرتبة ونظيفة جيداً بعد استخدامها.			

الإنتاج وفقاً للمواصفات (النظري)

مستوى الإنجاز			البنـد	الرقم
ضعيف	متوسط	جيد		
			فهم أسماء، وأنواع، واستخدامات المبراد اليدوية.	١
			فهم أسماء كل جزء، وأنواع، وحجم أسنان المبراد المبططة.	٢
			قراءة وفهم أبعاد التشطيب الخشن الموضحة في الرسم الميكانيكي.	٣
			فهم متطلبات القلوطة الموضحة في الرسم الميكانيكي.	٤
			قراءة وفهم أبعاد الثقب الموضحة في الرسم الميكانيكي.	٥
			قراءة وفهم الأطوال والتفاوت الموضح في الرسم الميكانيكي.	٦
			فهم مكان التخويش الموضح في الرسم الميكانيكي.	٧
			قراءة وفهم أبعاد مكان المقبض على السطح العلوي الموضح في الرسم الميكانيكي.	٨
			فهم أسماء وأنواع مجموعة المبراد.	٩
			فهم الاستخدامات والأنواع المختلفة وأحجام الأسنان لقماش الصنفرة.	١٠

الإنتاج وفقاً للمواصفات (العملي)

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	فحص نصف قطر التشطيب باستخدام الضبعة.			
٢	فحص أبعاد المساحة المسطحة باستخدام القدمة ذات الورنية.			
٣	شكرة قطعة العمل باستخدام ورنية الارتفاعات.			
٤	تعلم طريقة استخدام ذكر القلاووظ.			
٥	تعلم الطريقة الصحيحة لبرد المعادن .			
٦	تعلم الطريقة الصحيحة لاستخدام مجموعة المبارد.			
٧	تعلم طريقة استخدام المثقاب.			
٨	تحقق من عمودية الزاوية باستخدام الزاوية القائمة.			
٩	تعلم المهارات الأساسية لاستخدام قماش الصنفرة.			



## العنوان: توصيل المقاومات

(١) مراحل العمل:

رقم العملية	العملية	مدة التنفيذ المتوقعة
العملية ١	قانون أوم	٣ ساعات
العملية ٢	توصيل المقاومات (على التوالي)	٦ ساعات
العملية ٣	توصيل المقاومات (على التوازي)	٦ ساعات
العملية ٤	توصيل المقاومات (على التضاعف)	٦ ساعات
	الإجمالي	٢١ ساعة

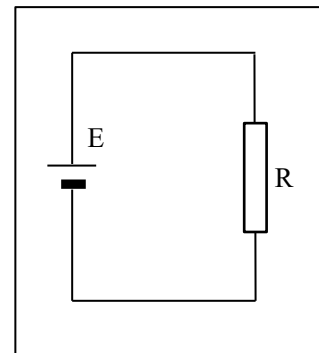
فيما يلي خطة الدرس للعملية ١ كمثال.



العملية ١: قانون أوم

المدة	٣ ساعات
المتطلبات	✓ حساب قيمة المقاومة من قيمة القياس للجهد والتيار.
الأدوات والمواد	✓ مقاومة ثابتة ( $100\Omega$ ) (يُمكن تغيير هذه القيمة). ✓ منبع تغذية للتيار المستمر. ✓ جهاز أفوميتر.
معايير الأداء	✓ فهم مخطط الدائرة الكهربائية ✓ توصيل الدائرة الكهربائية بدقة. ✓ قياس قيم الجهد والتيار باستخدام جهاز أفوميتر. ✓ تدوين قيم القياس. ✓ فهم قانون أوم. ✓ حساب قيمة المقاومة من قياس قيم الجهد والتيار. ✓ التأكد ما إذا كانت قيم المقاومة المحسوبة مساوية لقيم كود الألوان المعروضة على المقاومة.

السلوك المستهدف للطلاب	كيف يقدم المعلمون التوجيهات (*)	طريقة تقييم الطالب
✓ فهم العمليات بالكامل. ✓ فهم العملية ١.	✓ يشرح المعلم مراحل العمل بالكامل (العمليات ١ - ٤). ✓ يشرح المعلم العملية ١ (المتطلبات).	مراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم.
فهم نظرية المتعلقة بالعملية ١. مخطط الدائرة <	من أجل تنفيذ العملية ١، قم بشرح ما يلي: ✓ يقوم المعلم بعرض مخطط الدائرة على الطلاب وشرح لهم الرموز (منبع التيار المستمر، المقاومة). ✓ يقوم المعلم بعرض المقاومة (الخامات) وشرح وظائف وأنواع المقاومات المختلفة. اشرح طريقة قراءة كود الألوان المعروضة على المقاومة.	مراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم.



	<p>✓ يقوم المعلم بعرض منبع تغذية التيار المستمر وشرح وظيفة واسم كل جزء.</p> <p>✓ يقوم المعلم بعرض الأفوميتر وشرح وظيفة واسم كل جزء.</p> <p>✓ يشرح المعلم النظرية الأساسية لقانون أوم.</p>							
<p>مراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم أثناء العرض.</p>	<p>يقوم المعلم بعرض طرق العمل المذكورة أدناه:</p> <p>✓ كتابة الجدول ١ على السبورة.</p> <p>✓ توصيل الدائرة طبقاً لمخطط الدائرة.</p> <p>✓ ضبط منبع تغذية التيار المستمر على ١٠ فولت.</p> <p>✓ قياس الجهد والتيار باستخدام الأفوميتر. ثم كتابة قيم القياس في الجدول ١ على السبورة.</p> <p>✓ حساب قيمة المقاومة واكتبها في الجدول ١.</p>	<p>الانتباه إلى شرح المعلمين بعناية وفهم مراحل تنفيذ العملية جيداً.</p> <p>جدول ١</p> <table border="1"> <tr> <td>الجهد</td> <td>١٠ فولت</td> </tr> <tr> <td>التيار</td> <td></td> </tr> <tr> <td>المقاومة</td> <td></td> </tr> </table>	الجهد	١٠ فولت	التيار		المقاومة	
الجهد	١٠ فولت							
التيار								
المقاومة								
<p>✓ توصيل الدائرة وفقاً لمخطط الدائرة.</p>	<p>يقوم المعلم بالتنقل بين الطلاب وإعطاء التعليمات بشكل متكرر.</p>	<p>القيام بالعمل:</p> <p>✓ كتابة جدول ١ على السبورة.</p> <p>✓ توصيل الدائرة وفقاً لمخطط الدائرة.</p>						
<p>✓ تم ضبط منبع تغذية التيار المستمر على ١٠ فولت.</p>	<p>يقوم المعلم بالتنقل بين الطلاب وإعطاء التعليمات بشكل متكرر.</p>	<p>القيام بالعمل: ضبط منبع تغذية التيار المستمر على ١٠ فولت.</p> 						
<p>✓ كتابة قيم القياس</p>	<p>يقوم المعلم بالتنقل بين الطلاب وإعطاء</p>	<p>القيام بالعمل: قياس الجهد</p>						

<p>للجهد والتيار في جدول ا.</p>	<p>التعليمات بشكل متكرر.</p>	<p>والتيار باستخدام الأفوميتر. ثم كتابة قيم القياس في جدول ا. </p>
<p>✓ قيمة المقاومة المحسوبة مساوية لقيمة كود الألوان المعروضة على المقاومة.</p>	<p>يبلغ المعلم الطلاب أنه إذا كانت قيمة المقاومة المحسوبة مساوية للقيمة المعروضة، يكون العمل قد اكتمل. إذا كانت القيم مختلفة، اطلب من الطلاب إبلاغ المعلم.</p>	<p>التأكد من النتائج: حساب قيمة المقاومة من قيمة القياس وكتابة قيمة المقاومة في جدول ا. التحقق من قيمة كود الألوان المعروضة على المقاومة وإذا كانت قيمة المقاومة المحسوبة مساوية للقيمة المعروضة، يكون العمل قد اكتمل. إبلاغ المعلم إذا كانت القيم مختلفة.</p>

<متقدم>

طريقة تقييم الطالب	كيف يقدم المعلمون التوجيهات (*)	السلوك المستهدف للطلاب
<p>مراجعة مستوى فهم الطلاب من خلال سؤال بعضهم عن مدى فهمهم.</p>	<p>يقوم المعلم بإعطاء الإرشادات المذكورة تحت بند سلوك الطلاب المستهدف في "العمل"</p>	<p>فهم تعليمات المعلم.</p>
<p>✓ ضبط منبع تغذية التيار المستمر بدقة. ✓ كتابة قيمة القياس في الجدول ٢.</p>	<p>يقوم المعلم بالتنقل بين الطلاب وإعطاء التعليمات بشكل متكرر.</p>	<p>القيام بالعمل: ✓ كتابة جدول ٢ على السبورة. ✓ ضبط منبع تغذية التيار المستمر على ٠ فولت. ✓ قياس الجهد والتيار باستخدام الأفوميتر. ثم كتابة قيمة القياس في جدول ٢. ✓ زيادة الجهد ١ فولت في المرّة الواحدة. ثم قياس</p>

		<p>الجهد والتيار باستخدام جهاز الأفوميتر، وكتابة قيم القياس في جدول ٢.</p> <p>✓ الاستمرار في رفع الجهد حتى ١٠ فولت بنفس الطريقة.</p>
<p>✓ قيمة المقاومة المحسوبة هي نفس قيمة كود الألوان المعروضة على المقاومة.</p>	<p>يبلغ المعلم الطلاب أنه إذا كانت قيمة المقاومة المحسوبة مساوية للقيمة المعروضة، يكون العمل قد اكتمل. إذا كانت القيم مختلفة، اطلب من الطلاب إبلاغ المعلم.</p>	<p>التأكد من النتائج:</p> <p>✓ حساب قيمة المقاومة من قيم القياس وكتابة القيمة المحسوبة في جدول ٢. التحقق من قيمة المقاومة المعروضة باستخدام كود الألوان وإذا كانت قيمة المقاومة المحسوبة مساوية للقيمة المعروضة، يكون العمل قد اكتمل. إبلاغ المعلم إذا كانت القيم مختلفة.</p>

### الجدول ٢

١٠	٩	٨	٧	٦	٥	٤	٣	٢	١	.	الجهد <V>
											التيار <mA>
											المقاومة <Ω> R

## التقييم الذاتي بواسطة الطلاب

المدة: ١٠ دقائق

إرشادات التقييم:

- ١- هذا التقييم الذاتي بكامل العمل (العملية ١ حتى العملية ٤).
- ٢- يرجى الرجوع إلى استمارة التقييم الذاتي هذه للاسترشاد بها عند تنفيذ العمل. حاول أن تكون جميع الإجابات "نعم".
- ٣- بعد الدرس العملي، قم بعمل الاستمارة بنفسك.

السلوك الآمن/ إدارة الوقت/ التصنيف، الترتيب، التنظيف 3S

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	السلوك الآمن: أنا أتبع معايير وقواعد زي الورشة.			
٢	السلوك الآمن: أنا أتبع معايير وتعليمات السلوك الآمن.			
٣	إدارة الوقت: أنا لم أتأخر عن الدرس.			
٤	التصنيف، الترتيب، التنظيف 3S: لقد قمت بإعادة الأدوات/ المواد التي استخدمتها إلى مكانها الصحيح.			
٥	التصنيف، الترتيب، التنظيف 3S: لقد حافظت دائماً على طاولة العمل مرتبة ونظيفة جيداً بعد استخدامها.			

الإنتاج وفقاً للمواصفات (نظرياً)

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	فهم معنى رموز مخطط الدائرة الكهربائية.			
٢	فهم وظيفة وأنواع المقاومات.			
٣	فهم كيفية قراءة كود الألوان المعروضة على المقاومات.			
٤	فهم وظيفة واسم كل جزء في جهاز الأفوميتر.			
٥	فهم وظيفة واسم كل جزء في منبع تغذية التيار المستمر.			
٦	فهم النظرية الأساسية لقانون أوم.			

الإنتاج وفقاً للمواصفات (عملياً)

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	توصيل منبع تغذية التيار المستمر طبقاً لمخطط الدائرة الكهربائية.			
٢	توصيل المقاومات طبقاً لمخطط الدائرة الكهربائية.			
٣	ضبط منبع تغذية التيار على القيمة المطلوبة.			
٤	قياس قيم المقاومة باستخدام الأفوميتر.			
٥	قياس قيم الجهد باستخدام الأفوميتر.			
٦	قياس قيم التيار باستخدام الأفوميتر.			

### استمارة تقييم الطالب بواسطة المعلم

	الصف		الفصل
	الاسم		القسم
	اليوم		الحضور / الغياب
	رقم الدرس		عنوان الدرس

السلوك الآمن / إدارة الوقت / التصنيف، الترتيب، التنظيف 3S

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	السلوك الآمن: أتبع الطالب معايير وقواعد زي الورشة.			
٢	السلوك الآمن: أتبع الطالب معايير وتعليمات السلوك الآمن.			
٣	إدارة الوقت: لم يتأخر الطالب عن الدرس.			
٤	التصنيف، الترتيب، التنظيف 3S: أعاد الطالب الأدوات / المواد التي استخدمها إلى مكانها الصحيح.			
٥	التصنيف، الترتيب، التنظيف 3S: حافظ الطالب دائماً على طاولة العمل مرتبة ونظيفة جيداً بعد استخدامها.			

الإنتاج وفقاً للمواصفات (نظرياً)

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	فهم معنى رموز مخطط الدائرة الكهربائية.			
٢	فهم وظيفة وأنواع المقاومات.			
٣	فهم كيفية قراءة كود الألوان المعروضة على المقاومات.			
٤	فهم وظيفة واسم كل جزء في جهاز الأفوميتر.			
٥	فهم وظيفة واسم كل جزء في منبع تغذية التيار المستمر.			
٦	فهم النظرية الأساسية لقانون أوم.			

الإنتاج وفقاً للمواصفات (عملياً)

الرقم	البند	مستوى الإنجاز		
		جيد	متوسط	ضعيف
١	توصيل منبع تغذية التيار المستمر طبقاً لمخطط الدائرة الكهربائية.			
٢	توصيل المقاومات طبقاً لمخطط الدائرة الكهربائية.			
٣	ضبط منبع تغذية التيار على القيمة المطلوبة.			
٤	قياس قيم المقاومة باستخدام الأفوميتر.			
٥	قياس قيم الجهد باستخدام الأفوميتر.			
٦	قياس قيم التيار باستخدام الأفوميتر.			



## **Appendix 5**

### **Summary of “Guideline for Practical Lesson Improvement” (English/Arabic)**

# Guideline for Practical Lesson Improvement

## ~ Focusing on Repetitive Instructions ~

### Purpose of This Guideline

Talents who have Competency are required by the industry.

#### **Competency is to have a combination of:**

- **Knowledge**
- **Skills based on the knowledge**
- **Sense of purpose and attitude to perform using the knowledge and skills**

**To do something.**

This guideline aims to help principals and teachers at technical secondary schools, especially industrial secondary schools, understand competencies that students should acquire in their school days and shows the methods of practical lesson improvement to achieve this goal.

### Four Main Competencies that students should acquire:

- PR: Production according to request
- SB: Safe Behavior
- 3S: Sort/Set in Order/Shine
- TM: Time Management

### Instruction Methods:

Teachers have the students do “repetitive practice” and give them “repetitive instruction” to enable them to acquire Competency

## PR

Independently perform the basic steps (check requirements – work – confirm results) in order to produce work according to requests.



### Preparation for Instructions:

• **Practical Lesson Plan:** Teachers redesign the practical lesson plans to allow students to experience more repetitive practice of the basic steps and communicate the plans to students. There are 3 considerations when redesigning the lesson plan:

- Small group: Introduce practical lessons with small groups to have more students actually engage in work for a longer time. The number of students for one group is recommended at around four to ten, which is about the size in which a teacher is able to keep an eye on each student.
- Order of topics: Students should first learn the basic knowledge and skills before moving on to more advanced topics.
- Students' basic academic level: Teachers should have a good grasp of the students' basic academic level before the lesson on theory, and utilize it to decide the complexity of practical lesson (ex. the numbers of resistance elements used for electronics practical lessons) and the time necessary for each practical lesson.

• **Improvement of Lesson Plan:** Break down the work into small processes to increase practice of the basic steps.

• **Develop a system so that students can easily and repeatedly confirm the results of their work**

## SB

Independently perform safe behavior to ensure safety at corporate manufacturing sites.



<b>Dress code</b>	Wear clothes and protective equipment suitable for the work.
<b>Safe behavior</b>	Comply with the basic safe behavior standards (work procedures) for carrying out the work, and the ones that are focused on a particular work. This involves actions to be taken for safety, what not to do, and how to deal with accidents when they happen.
<b>Work environment</b>	The work environment such as work space, aisles, and arrangement of objects greatly affects the safety of workers. Therefore, teachers design a safety-conscious work environment, and students comply with it.

### Preparation for Instructions:

- Create and display a basic dress code
- Create and display basic standards for safe behavior
- Create a standard work environment

### 3S

Independently perform sort/set in order/shine at the workshop to increase product quality and to enable work efficiency.



<b>Sort</b>	<b>Remove unnecessary items:</b> Only keep items necessary for work and put away or discard all unnecessary items. By doing so, necessary items can be retrieved immediately, which increases the work efficiency
<b>Set in Order</b>	<b>Set items in order so that they are easy to use with labelling:</b> Decide where materials and tools should be stored and make sure that they are always placed there. This reduces the time looking for items, which increases work efficiency.
<b>Shine</b>	<b>Clean and inspect:</b> Clean the workshop and machines. This makes it possible to notice any issues, such as oil leak from the machines, thus increasing production efficiency and safety.

#### Preparation for Instructions:

- Teachers themselves practice Sort/ Set in order/ Shine in the workshop (Sort/Set in order/Shine)
- Create and display rules of Sort/ Set in order/ Shine (Standardize)
- Hold initial student trainings (Sustain)

### TM

Independently perform time management expected at companies.



#### Preparation for Instructions:

- Create the standard of preparation time to the next class and communicate to students
- Introduce system that allows the teachers and the students to know the time to start the next class
- Communicate to the students what responses are to be provided if they fail to follow the standard for time management behavior (tardiness)

#### Important Note:

“TM: Time Management” is tackled through concerted efforts that involve the whole school. Additionally, since Time Management is significantly related to the students’ lifestyle, the cooperation of the parents/guardians should be sought as necessary.

## Practical Lesson Model Flow

### 1. Roll call at the start of the practical lesson

**TM:** The teacher provides response to the tardy student according to the standard and asks the reason for being late. Give instructions as necessary.

**SB:** The teacher checks what the students are wearing. If there are any students who do not follow the dress code, the teachers have them correct it on the spot.



### 2. First explanation given after breaking up into groups



**PR (Check Requirements):** The teacher explains the following repeatedly until the students understand and also shows samples when necessary.

- Overall work process and the process covered in the lesson
- The objective of the work
- Requirements (specification documents, circuit diagrams, etc.)
- Basic theory
- Names and functions of machinery/equipment and tools

**SB:** The teacher explains the safety standards related to the work process in the lesson.

**3S:** Teacher asks the students to collect the tools/parts/materials necessary for the work in the lesson.



### 3. During work

**PR:** [Work] The teacher walks around the room to check whether the students are doing their work correctly. If not, the teacher instructs the student as many times as needed until the student is able to do the work correctly.



**PR:** [Confirm results] The teacher instructs the students to frequently check whether the results of their work meet the requirements. If, as a result, the work does not meet the requirements, the teacher instructs the student to check the requirements again and do the work.

**SB:** The teacher checks every student is doing work by following the safety standards. If a student is found to be doing work in an unsafe manner, communicate this to the student and show how it is done correctly

**3S:** The teacher checks every student is doing work by following the 3S standards. If a student is found to be not doing work in an 3S manner, communicate this to the student and show how it is done correctly.



### 4. After work



**PR:** Teacher explains the summary of the practical lesson of the day. If there is an example of a serious mistake, the teacher communicates it to all the students and encourages them to think why the mistake happened.

**3S:** The teacher instructs the students to clean the tools, machinery/equipment, and machines to remove any dust or dirt, and to return them to designated storage locations. The teacher instructs students to clean the workshop following the rules for cleaning.



**SB:** If there was any work performed in a way that may cause danger, the teacher gives feedback to the students on safety during work covered in the lesson.

### Tips for Repetitive Practice and Repetitive Instruction:

In order to have students efficiently acquire “Competency”, teachers should put into considerations the following points:

- 1) Make sure the students have a sense of purpose:** In order to have the students acquire the knowledge and skills efficiently, the students need to have a sense of purpose. Therefore, the necessity of each competency should be repeatedly communicated.
- 2) Have the students review their actions:** Having the students themselves be aware of and review whether they are taking correct actions also helps to turn the correct actions into a habit. During practical lessons, it is advisable to have individual students review their own actions and think together with all students at the end of the practical lesson by showing the examples of wrong behaviors found during lessons. Also, time management must be instructed throughout the students’ time at school.
- 3) Teacher becomes the role model for the students:** The teacher is a role model for the students. If the teacher does not practice correct actions, the students will follow it. Teachers must always be conscious of the students watching them, think back on how they are conducting themselves, and make improvements.
- 4) Teachers should have a shared understanding on instructions:** The students will be confused if teachers do not share the same understanding and give different instructions. It is necessary for the teachers to hold regular school staff meetings and department meetings, to ensure that they share a common understanding on the instructions.

## **Partnering with Companies**

### The Goals for Partnering with Companies

- To enable the teachers to understand the needs of the companies
- To enable the teachers to understand the hiring requirements and work conditions at the companies

### How to Find Companies to Partner with

It is recommended that schools collect the information of place of works of graduates and find the companies to partner with through the contacts of graduates who started working at companies.

### Example activities in Partnership with Companies

It mainly involves the following four activities:

- 1) Career advice by graduates (Graduate Advisory Session)
- 2) Company briefings for the students at school
- 3) Company visits
- 4) Company internships

## **Standard Implementation Process**

### A) Preparation

- (1) In-school training to ensure understanding of all teachers
- (2) Preparation at the departments for practical lessons
- (3) Preparation to instruct “TM: Time Management”
- (4) Setting goals for each competency
- (5) Communication to the parents/guardians

### B) Implementation

- (1) Student orientation regarding practical lessons
- (2) Implementation of improved practical lessons

### C) Review and Report

- (1) Measuring/recording target values for the competencies
- (2) Assessment of Practical Lessons
- (3) Information sharing at school staff meetings
- (4) Reporting to Idara/Mudiriyya/MOETE



## دليل إرشادات لتحسين الدروس العملية

- (من خلال التركيز على التكرار) -

### الهدف من دليل الإرشادات:

ينطلب مجال الصناعة الأشخاص الذي يمتلكون الجدارات.

الجدارة هي وجود مزيج من:

- المعرفة
- المهارات القائمة على المعرفة
- الاحساس بالهدف والدافع للتطبيق العملي باستخدام المعرفة والمهارات من أجل تحقيق شيء ما.

يهدف هذا الدليل الإرشادي إلى مساعدة مديري المدارس والمعلمين في المدارس الثانوية الفنية، وخاصة المدارس الثانوية الصناعية، على فهم الجدارات التي يجب أن يكتسبها الطلاب في أيامهم الدراسية ويوضح طرق تحسين الدروس العملية لتحقيق هذا الهدف.

### ينبغي على الطلاب اكتساب أربع جدارات رئيسية:

- PR: الإنتاج وفقاً للمواصفات.
- SB: السلوك الآمن.
- 3S: التصنيف / الترتيب / التنظيف.
- TM: إدارة الوقت

### أساليب التدريس:

يقوم المعلمون بتمكين الطلاب من اكتساب الجدارات بشكل أساسي عن طريق توجيه الطلاب إلى الممارسة المتكررة وإعطاء التوجيهات المتكررة في الدروس العملية.



يقوم بشكل مستقل بأداء "مراحل العمل الأساسية"  
(مراجعة المتطلبات - القيام بالعمل - التأكد من النتائج)  
من أجل تصنيع المنتج وفقاً للمواصفات.

**PR: الإنتاج وفقاً  
للمواصفات**

### التحضيرات اللازمة للتوجيهات:

- **خطة الدروس العملية:** يقوم المعلمون بمواءمة خطط الدروس العملية لتمكين الطلاب من القيام بمزيد من الممارسة المتكررة لمراحل العمل الرئيسية وإبلاغها للطلاب. هناك ثلاث نصائح مهمة عند مواءمة خطة الدروس العملية.
  - **تشكيل مجموعات صغيرة:** من أجل زيادة وقت استخدام الطالب للمعدات/ الأدوات، يتم تقديم دروساً عملية في مجموعات صغيرة. يوصى بأن يكون عدد الطلاب في المجموعة الواحدة حوالي أربعة إلى عشرة طلاب، وهو العدد الذي يستطيع فيه المعلم مراقبة كل طالب.
  - **ترتيب الموضوعات:** يجب أن يتعلم الطلاب أولاً المعارف والمهارات الأساسية قبل الانتقال إلى الموضوعات المتقدمة.
  - **المستوى الأكاديمي الأساسي للطلاب:** يجب أن يكون لدى المعلمين فهم جيد للمستوى الأكاديمي الأساسي للطلاب قبل تدريس النظرية، النظرية، واستخدامه لتحديد مدى صعوبة الدرس العملي (على سبيل المثال، عدد عناصر المقاومة المستخدمة في الدروس العملية للإلكترونيات) والوقت اللازم لكل درس عملي.
- **تحسين خطة الدروس:** تقسيم العمل إلى عمليات صغيرة لزيادة ممارسة مراحل العمل الأساسية.
- **تطوير نظام لتمكين الطلاب من مراجعة نتائج عملهم بسهولة وبصفة متكررة.**



يقوم بشكل مستقل بأداء السلوك الآمن  
لضمان السلامة في مواقع العمل بالمصنع.

**SB السلوك الآمن**

زي الورشة	ارتداء الملابس والأدوات الواقية المناسبة للعمل بشكل صحيح.
السلوك الآمن	اتباع لمعايير السلوك الآمن الأساسية (مراحل العمل) لتنفيذ العمل، وكذلك المعايير الخاصة بعمل معين. يتضمن ذلك الإجراءات الواجب اتخاذها من أجل السلامة، وما لا يجب القيام به، وكيفية التعامل مع الحوادث عند وقوعها.
بيئة العمل	تؤثر بيئة العمل مثل مساحة مكان العمل، والممرات الجانبية، وترتيب الأشياء بشكل كبير على سلامة العمال. لذلك، من الضروري تصميم بيئة عمل تراعي معايير السلامة، ويلتزم بها الطلاب.

### التحضيرات اللازمة للتوجيهات:

- إعداد وعرض القواعد الأساسية لزي الورشة
- إعداد وعرض المعايير العامة للسلوك الآمن
- إنشاء بيئة عمل قياسية



يقوم بشكل مستقل بالتصنيف - الترتيب - التنظيف داخل الورشة لزيادة جودة المنتج والعمل بكفاءة.

**3S: التصنيف / الترتيب / التنظيف**

<b>التصنيف</b>	إزالة العناصر غير الضرورية: احتفظ فقط بالعناصر الضرورية للعمل وأبعد أو تخلص من جميع العناصر غير الضرورية، وبذلك يمكن استرجاع العناصر الضرورية على الفور، مما يزيد من كفاءة العمل.
<b>الترتيب</b>	قم بترتيب العناصر بحيث يسهل استخدامها مع وضع العلامات عليها: حدد مكان تخزين المواد والأدوات وتأكد من وضعها دائمًا هناك. هذا يقلل من وقت البحث عن العناصر، مما يزيد من كفاءة العمل.
<b>التنظيف</b>	التنظيف والفحص: نظف ورشة العمل والآلات. هذا يجعل من الممكن ملاحظة أية مشكلات، مثل تسرب الزيت من الآلات، وبالتالي زيادة كفاءة الإنتاج والسلامة.

#### التحضيرات اللازمة للتوجيهات:

- يمارس المعلمون أنفسهم (التصنيف / الترتيب / التنظيف) في ورشة العمل
- إعداد وعرض قواعد التصنيف / الترتيب / التنظيف (التنميط)
- عقد تدريبات أولية للطلاب (التثبيت)



يقوم بشكل مستقل بإدارة الوقت بالشكل المتوقع في المصنع.

**TM: إدارة الوقت**

#### التحضيرات اللازمة للتوجيهات:

- وضع معايير وقت الاستعداد للحصة التالية وإبلاغها للطلاب
- تطوير نظام يتيح للمعلمين والطلاب معرفة وقت بداية الحصة التالية
- إبلاغ الطلاب ما هي العواقب المترتبة على عدم إتباع معايير سلوك إدارة الوقت (التأخير)

#### نصائح مهمة:

يتم تطبيق "إدارة الوقت" من خلال الجهود المتضافرة التي تشمل المدرسة بأكملها. ونظرًا لارتباطها بشكل كبير بأنماط حياة الطلاب، يجب أيضًا السعي للحصول على تعاون الوالدين/أولياء الأمور عند الضرورة.

### ١. أخذ الغياب في بداية الدرس العملي:

- إدارة الوقت: يقدم المعلم تنبيه للطلاب المتأخر وفقاً للمعايير، ويسأل عن سبب التأخر. يتم إعطاء التعليمات حسب الضرورة.



- السلوك الآمن: يراجع المعلم ما يرتديه الطلاب. إذا كان هناك أي طالب لا يتبع قواعد زي الورشة، يقوم المعلمون بتصحيح الوضع في الحال.

### ٢. بعد التقسيم إلى مجموعات، تقديم الشرح المبدئي:



- الإنتاج وفقاً للمواصفات (مراجعة المتطلبات): يشرح المعلم ما يلي عدة مرات حتى يفهم الطلاب، ويعرض عينات أيضاً حسب الضرورة.  
- العمل الكلي والعمليات الأصغر في الدرس  
- الهدف من العمل المتطلبات (المواصفات، مخضات الدوائر، وما إلى ذلك)  
- النظرية الأساسية  
- أسماء ووظائف الآلات / المعدات والأدوات



- السلوك الآمن: يوضح المعلم معايير السلامة الخاصة بالعمل في الدرس العملي.

- 3S: التصنيف/ الترتيب/ التنظيف: يطلب المعلم من الطلاب جمع الأدوات/ المكونات / المواد الخام اللازمة للعمل في الدرس.

### ٣. أثناء العمل:



- الإنتاج وفقاً للمواصفات (القيام بالعمل): يتجول المعلم في جميع أنحاء الغرفة للتحقق مما إذا كان الطلاب يقومون بعملهم بشكل صحيح. إذا لم يكن الأمر كذلك، يوجه المعلم الطالب عدة مرات حسب الحاجة حتى يتمكن الطالب من القيام بالعمل بشكل صحيح.

- الإنتاج وفقاً للمواصفات (التأكد من النتائج): يقوم المعلم بتوجيه الطلاب لكي يراجعوا بشكل متكرر ما إذا كانت نتائج عملهم تفي بالمتطلبات. بناءً على تلك المراجعة، إذا كان العمل لا يفي بالمتطلبات، يقوم المعلم بتوجيه الطالب لمراجعة المتطلبات مرة أخرى وإعادة العمل.



- السلوك الآمن: يتحقق المعلم من قيام كل طالب بعمله من خلال اتباع معايير الأمن والسلامة. إذا تبين أن هناك طالب يقوم بعمله بطريقة غير آمنة، أبلغ الطالب بذلك ووضح له كيف يتم ذلك بشكل صحيح.

- 3S / التصنيف / الترتيب / التنظيف: يتحقق المعلم من قيام كل طالب بعمله من خلال اتباع معايير الـ(3S) التصنيف / الترتيب / التنظيف. إذا تبين أن الطالب لا يقوم بعمله بطريقة الـ(3S) ، أبلغ الطالب بذلك ووضح له كيف يتم ذلك بشكل صحيح.

### ٤. بعد العمل:

- الإنتاج وفقاً للمواصفات: يشرح المعلم ملخص الدرس العملي لليوم. إذا كان هناك مثال لوقوع خطأ كبير، يقوم المعلم بإبلاغه إلى جميع الطلاب ويشجعهم على التفكير في سبب حدوث هذا الخطأ.



- التصنيف / الترتيب / التنظيف: يوجه المعلم الطلاب إلى تنظيف الأدوات والآلات / المعدات لإزالة أي غبار أو بقع، وإعادةهم إلى مواقع التخزين المخصصة. يوجه المعلم الطلاب إلى تنظيف ورشة العمل وفقاً لقواعد التنظيف.

- السلوك الآمن: إذا كان هناك أي عمل تم إجراؤه بطريقة قد تتسبب في حدوث خطر، فإن المعلم يقدم ملاحظات للطلاب حول العمل بأمان للمحتوى الذي تم في الدرس.



## نصائح مهمة للممارسة والتوجيهات المتكررة:

من أجل اكتساب الجدارة بكفاءة، يراعي المعلمون النقاط التالية قبل إعطاء التعليمات:

(١) **تأكد من أن الطلاب لديهم احساس بالهدف:** من أجل جعل الطلاب يكتسبون المعرفة والمهارات بكفاءة، يحتاج الطلاب إلى الاحساس بالهدف. لذلك، يجب شرح ضرورة كل جدارة مرارًا وتكرارًا في بداية الدرس العملي.

(٢) **اطلب من الطلاب مراجعة تصرفاتهم:** إن جعل الطلاب أنفسهم يدركون ويراجعون ما إذا كانوا يتخذون إجراءات صحيحة يساعد أيضًا في تحويل الإجراءات الصحيحة إلى عادة. خلال الدروس العملية، يُنصح أن يقوم الطلاب كل على حدة بمراجعة تصرفاتهم، والتفكير مع جميع الطلاب في نهاية الدرس العملي من خلال عرض أمثلة على السلوكيات الخاطئة الموجودة أثناء الدروس. وفيما يخص إدارة الوقت، يجب أن يتم إعطاء التعليمات في الحياة المدرسية ككل.

(٣) **يكون المعلم نموذجًا يحتذى به بالنسبة للطلاب:** يعد المعلم نموذجًا يحتذى به بالنسبة للطلاب. إذا لم يمارس المعلم الإجراءات الصحيحة، فسوف يتبعه الطلاب. إذا كان الطلاب لا يتخذون إجراءات صحيحة، فسوف يبدو الأمر كما لو أن المدرسة تؤكد أن معلمها لا يتخذون الإجراءات الصحيحة. يجب أن يكون المعلمون دائمًا على وعي بأن الطلاب يشاهدونهم، ويعيدوا التفكير في كيفية أدائهم وتحسينه باستمرار.

(٤) **يجب أن يكون لدى المدرسين فهم مشترك للتوجيهات:** سوف يرتبك الطلاب إذا لم يشترك المعلمون في نفس الفهم وقدموا إرشادات مختلفة. من الضروري للمعلمين عقد اجتماعات منتظمة لموظفي المدرسة واجتماعات القسم لضمان وجود فهم مشترك للتوجيهات.

## الشراكة مع المصانع

أهداف الشراكة مع المصانع:

- تمكين المعلمين من فهم احتياجات المصانع.
- تمكين المعلمين من فهم متطلبات التوظيف وظروف العمل في المصانع.

كيفية العثور على مصانع لإقامة شراكات معها

يوصى بأن تقوم المدارس بجمع معلومات عن مكان أعمال الخريجين والعثور على المصانع التي يمكن أن تتشارك معها من خلال بيانات الخريجين الذين بدأوا العمل في المصانع.

أمثلة لتنفيذ أنشطة بالشراكة مع المصانع:

تشتمل الأنشطة بشكل أساسي على الأنشطة الأربعة التالية:

- (١) نصيحة مهنية من الخريجين (جلسة نصح من قبل الخريجين للخريجين)
- (٢) جلسة تعريفية للطلاب عن المصانع.
- (٣) زيارات المصانع.
- (٤) التدريبات داخل المصنع

## عملية التنفيذ القياسية:

### أ) الإعداد

- (١) التدريب داخل المدرسة لضمان فهم المعلمين
- (٢) إعداد الأقسام للدروس العملية
- (٣) الإعداد لتدريس إدارة الوقت
- (٤) تحديد الأهداف لكل جدارة
- (٥) التواصل مع الآباء/ أولياء الأمور

### ب) التنفيذ

- (١) جلسة تقديمية للطلاب عن الدروس العملية
- (٢) تنفيذ الدروس العملية المحسنة

### ج) المراجعة والتقارير

- (١) قياس / تسجيل القيم المستهدفة للجدارات
- (٢) تقييم الدروس العملية
- (٣) تبادل المعلومات في اجتماعات العاملين
- (٤) رفع التقارير إلى الإدارة/ المديرية التعليمية/ وزارة التربية والتعليم والتعليم الفني

## **Appendix 6**

### **Best Practice Collection of “Guideline for Practical Lesson Improvement” (English/Arabic)**



## **Successful Case Study**

In Japan, although the industry uses the latest equipment and technology to manufacture the latest products, industrial schools focus on training students on basic hard skills and soft skills through repetitive practice and repetitive instruction. This approach can be implemented at low cost without advanced equipment.

“Guideline for Practical Lesson Improvement ~ Focusing on Repetitive Instructions ~” was developed with reference to this Japanese approach. Some technical secondary schools in Egypt have successfully introduced the model activities described in the Guidelines. This booklet will introduce successful cases of those schools that will help school managements and teachers introduce model activities even under constraints and obstacles at schools.

## **Case 1: Improvement of PR (Production according to Request) at Electronics Department of Dr. Ahmed Zewail school for dual education for girls in Port Said**

### **1. Challenge**

In electronics departments, there were variations in students' skill level. Teachers faces challenges to teaching students with different skill level at once.

### **2. Introduction of Model Activities recommended in the Guidelines**

To solve it, the teachers introduced the following model activities at their classes.

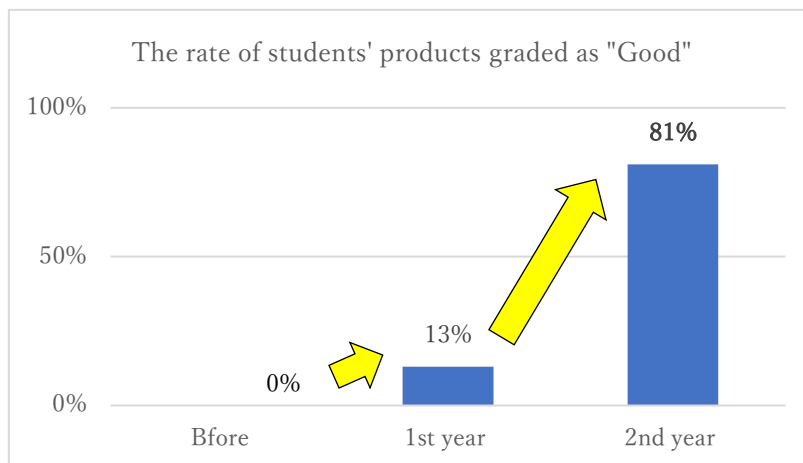
- ✧ **Divide the students into small groups:** The teachers divided the students into small groups. The Guideline recommends small group to increase the time each student use equipment/tools. The teachers introduced this method not only for this purpose but also for teaching students with different skill level. They classified the students according to their skill level to make high skilled students and low skilled students into one group to acquire skills from each other.
- ✧ **Break the work into small processes:** The teachers broke down the work into small processes, and instructed students not to work for next process until the teachers review their current progress. The teachers taught students to repetitively practice the basic steps (check requirement, work and confirm results) at each process.

### **3. Result**

#### **Voice from practical teachers:**

Before introducing the activities, we were not able to train students with less skill to reach high skill level. I was explaining lesson to all students at once without dividing them into groups before. Some students understood the lesson but the other not. Now, it is easier for all students to understand by the instruction in small groups. Breaking the work into small processes helps both teachers and students to confirm results at each process. So, students can gain good products at the end. This increased students' enthusiasm and self-confidence. Introducing the activities resulted in the decrease of individual variations between students.

**Improvement of students' product quality:** The rate of students' products graded as "Good" based on the Japanese evaluation criteria improved from 0% to 81% within two years after introducing activities.



## Case 2: Improvement of TM: Time Management at Dr. Ahmed Zewail school for dual education for girls in Port Said

### 1. Challenge

The school had challenges in improving punctuality of both students and teachers. Students did not care about time management. Even some teachers were not strict on time.

### 2. Introduction of Model Activities recommended in the Guidelines

To solve it, the school introduced the following model activities.

- ✧ **Introduction of time management system:** The school introduced system recommended by the Guideline (5 mins break, time table, wall clock and automatic bell system)
- ✧ **Development of the same understanding among teachers:** The principal explained the importance of time management and new system for improving punctuality to teachers. Regular morning meetings were led by the principal to develop the same understanding among teachers and to discover practical solutions together by exchanging information and ideas.
- ✧ **Repetitive practice and instructions:** Roll calls and record system of late comers at each class and practical lesson was introduced. “Numbering card system was introduced that students are aligned having their own number at the beginning of the lesson for easily checking attendance and late comers. The teachers repetitively asked students to keep watching the time during classes and lessons for taking the management into root.



Roll call using numbering card

### 3. Result

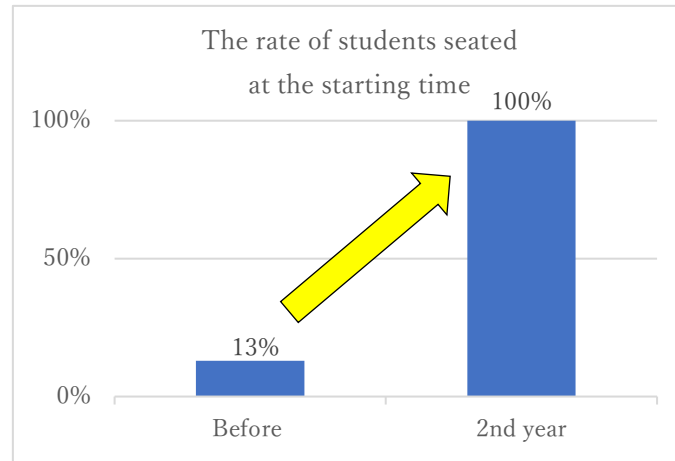
**Voice from the principal:** All teachers became time conscious as they realized that the students cannot be so unless the teachers became role models for the students. I encountered resistances from some teachers as they were reluctant to change the culture. I listened to them carefully and had logical and calm conversation with them to reach to mutual understanding. I also gave more roles to some teachers who had passion to improve.

**Voice from teachers:** The students' time management has been improved by the new system, teachers' commitment to be a role model, and continuous encouragement by delivering the message of importance of respecting time.

As an other impact, the trust was increased among the school management, the teachers, the students, the parents, and the partner companies for dual education, as the students became better

regarding time management. There was an opinion of a student that her learning of the competencies helped her a lot inside the factory of partner companies.

**Improvement of students' time management:** The rate of students seated at the starting time was improved from 13% to reached to 100% within two years after introducing the activities.



### Case 3: Improvement of PR (Production according to Request) Electronics Department of Port Said Technical Secondary School for Girls in Port Said

#### 1. Challenge

The electronics teachers found that their students did not have much interest and motivation in practical lessons, and they did not have self-confident in the measurement process to evaluate products.

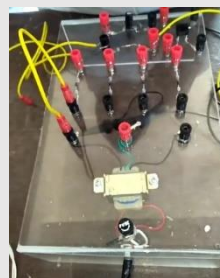
#### 2. Introduction of Model Activities recommended in the Guidelines

To solve it, the teachers introduced the following model activities at their classes.

- ✧ **Break down the work into the small processes:** The teachers used to let students implement the practical exercise in one step from the start to end in the past. Instead, the teachers started to break down the work into small processes to let students to practice basic steps (check requirement, work and confirm results) at each process. The teachers also started to make training components with acrylic sheets and electronics parts by themselves to make repetitive practice and instruction easier. In the past, the teachers used to let students make electrical circuits by soldering. Repetitive practice and instruction were not easy in this way as it usually took time to make a circuit, and it was not easy to modify it after soldering. Instead, the new training components made repetitive practice easier as students can easily assemble and change the circuits just by connecting wires. The teachers gave instruction to students to make measurement repetitively until they could reach correct results.



Teachers making training components



Training component



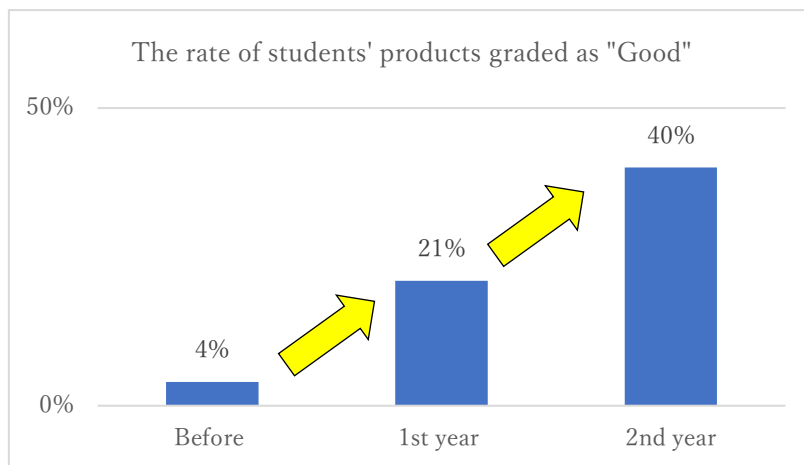
Students working with the component

### 3. Result

**Voice from the practical teachers:** Introducing small processes and the training components enabled students to repetitively practice the basic steps; check requirement, work, and confirm results (measurement). As a result, students developed self-confident in implementing the basic steps, and become more motivated. At the end of the practical exercise and reaching the results, students have a sense of the value and usefulness of the practical exercises. Creating the training components is not costly. Once you create the component, it is possible to use many times for several types of exercise compared to circuit board made by soldering. Introduction of repetitive practice and instruction is possible with small investment.

**Voice from a student:** Dividing the practical exercise into many small steps and providing a chance to measure each step encouraged us to work confidently during the practical lessons.

**Improvement of students' product quality:** The rate of students' products graded as "Good" based on the Japanese evaluation criteria improved from 4% to 40% within two years after introducing activities.



**Case 4: Improvement of PR (Production according to Request) at Mechanical department of El-Araby School for Applied Technology School in Quesna**

**1. Challenge**

Mechanical teachers had challenges to start practical lessons as the necessary machines and tools had not been fully introduced when the school had just opened.

**2. Introduction of Model Activities recommended in the Guidelines**

To solve it, the practical teachers introduced the following model activities.

✧ **Divide the students into small groups:** In order to use the limited number of machines and tools efficiently, the teachers divided 25 students from one class into three groups for teaching three different topics; filing, gas welding and arc welding based on the available machines and tools. The teachers developed the lesson schedule as below.



Teaching in small group

	Group A	Group B	Group C
1 <sup>st</sup> three weeks	Filing	Gas welding	Arc welding
2 <sup>nd</sup> three weeks	Arc welding	Filing	Gas welding
3 <sup>rd</sup> three weeks	Gas welding	Arc welding	Filing

Each teacher supervised each group, and have students repetitively practice basic steps; check requirement, work and confirm results.



Each teacher monitoring students closely and giving advice

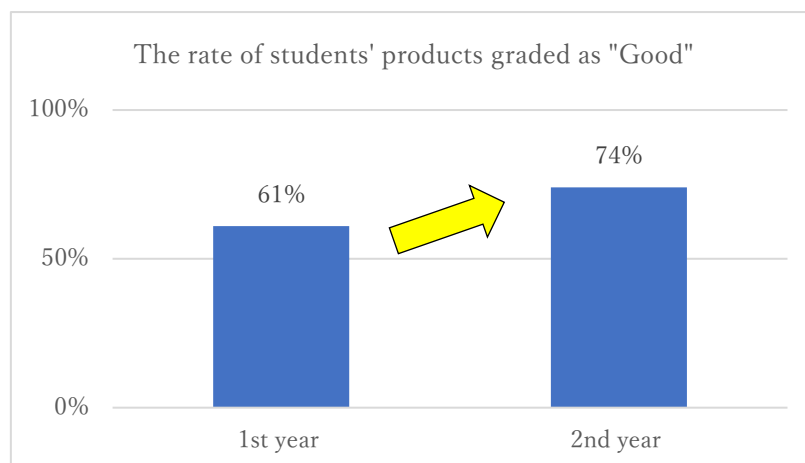


### 3. Result

**Voice from the practical teachers:** The small group lesson enabled students to engage in the work by using available machines and tools. Students gained confidence of using equipment and machines through repetitive practice. It is possible to recycle the old materials which one group used for another group. So, the small group lesson would be very useful for enhancing students' PR (Production according to request) competency at schools which faces the shortage of resources. As an other impact, small group lesson also helped teachers to communicate information to students easily as well as following up students easily and guiding them in contrast to large group lesson.

**Voice from students:** I think the competencies which I equipped with during practical lessons will help me in the future in my workplace.

**Improvement of students' product quality:** The rate of students' products graded as "Good" based on the Japanese evaluation criteria was 61% in the first year and reached to 74% in the 2<sup>nd</sup> year of introducing the activities.



## Case5: Improvement of 3S(Sort/Set in Order/Shine) at Mechanical department of El-Araby School for Applied Technology School in Quesna

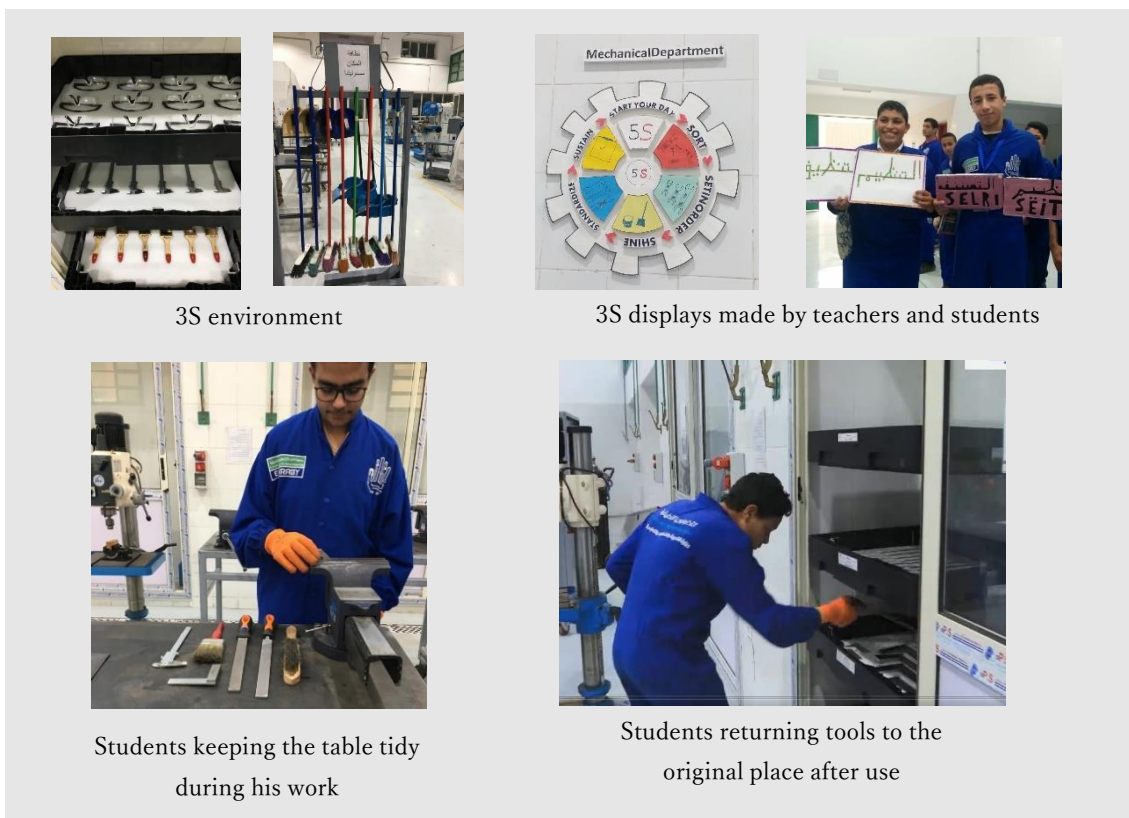
### 1. Challenge

Mechanical teachers had challenges to implement and teach 3S as there was no storage for organizing the workshop when the schools had just opened.

### 2. Introduction of Model Activities recommended in the Guidelines

To solve it, the practical teachers introduced the following model activities.

- ❖ **Practice 3S in the workshop:** The teachers organized the environment of workshops by using available resources such as cupboards and plastic boxes. The teachers also had students participate to increase the students' motivation and responsibility towards implementing 3S.
- ❖ **Create and display the rules for 3S:** The teachers made rules for 3S and posted visual instructions in the workshop.
- ❖ **Repetitive practice and instruction:** The teachers had students repetitively practice selecting necessary tools and devices from storage at the beginning of the lesson, keep their work-spaces tidy, and returning tools and devices to the original places and cleaning the workshops at the end of lessons.



### **3. Result**

**Voice from the practical teachers:** Practicing 3S is possible by using available materials. We practice the 3S in the workshop with students, and ask them not only to memorize the poster and repeat them, but also to share ideas for continuous improvement of 3S. This way motivates students to maintain 3S and keep improving.

**Voice from a student:** We consider 3S as an aid to time management so that if I am assigned to a specific task, I arrange the tools and machines in the way which I can work easily and efficiently. After the task is completed, I set the workplace in order and return the machines and tools to their original place to make it easy to find them again.

**Improvement of students' 3S:** The rate of students who return tools and materials to the original places properly after use reached 100% only in one month after introducing the activities.

## دراسة وتحليل لنجاح التطبيق

### مقدمة:-

بالرغم من أن الصناعة في اليابان تقوم على أحدث المعدات والتكنولوجيا لتصنيع أحدث المنتجات، لكن النهج المتبع بالتعليم الفني و المدارس الصناعية باليابان يقوم على تدريب الطلاب على المهارات الفنية الأولية والمهارات الشخصية الأساسية من خلال تكرار التوجيه وتكرار الممارسة، وهذا النهج يمكن تنفيذه بتكاليف اولية وليس باستخدام معدات متقدمة.

استنادًا للنهج الياباني قام المشروع بإعداد "دليل إرشادات تحسين الدروس العملية ~من خلال التركيز على التكرار~". وتم تطبيقه في بعض المدارس الفنية مما أدى الى نجاح التطبيق في إدخال نماذج لتلك الأنشطة الموضحة في الدليل الإرشادي.

في هذا الكتيب نقوم بتقديم حالات ناجحة للمدارس في ادخال انموذجية التي ستساعد إدارات المدارس والمعلمين على تطبيق الأنشطة حتى في ظل القيود والعقبات التي قد تواجه المدارس.

## الحالة رقم 1: تحسين PR (الإنتاج وفقاً للمواصفات) في قسم الإلكترونيات في مدرسة الدكتور أحمد زويل للتعليم المزدوج للبنات في بورسعيد.

### 1. التحدي

التباين في مستوى مهارات الطلاب الفنية في قسم الإلكترونيات ومواجهة المعلمون تحديات في توجيه وإرشاد الطلاب جميعاً في نفس الوقت بسبب اختلاف مهاراتهم.

### 2. اعتماد وإدخال الأنشطة النموذجية الموصى بها في الدليل الإرشادي

في سبيل ذلك، أدخل المعلمون الأنشطة النموذجية التالية في صفوفهم:

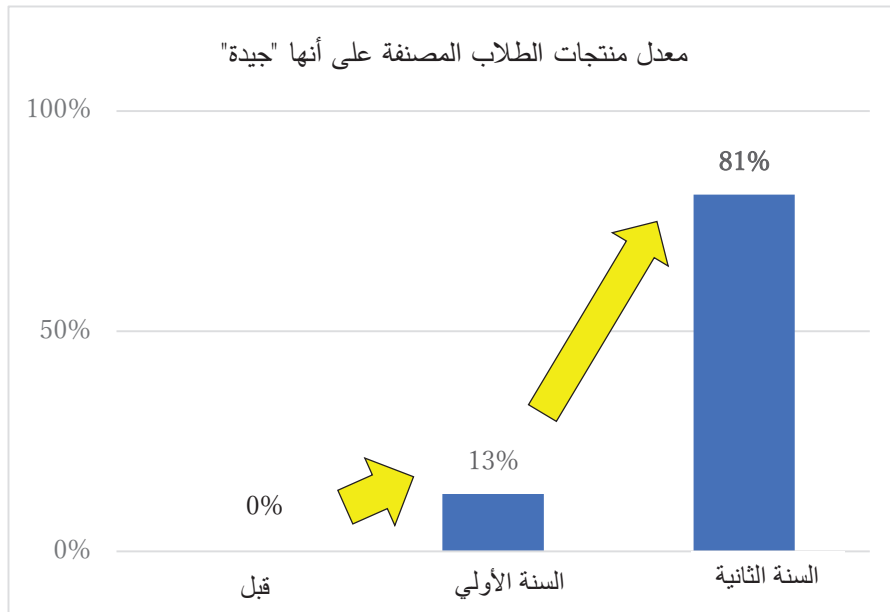
- ✧ **تقسيم الطلاب إلى مجموعات صغيرة:** قام المعلمون بتقسيم الطلاب إلى مجموعات صغيرة. يوصي الدليل الإرشادي بتكوين مجموعات صغيرة لإعطاء كل طالب فرصة أكبر في استخدام المعدات أو الأدوات. وأيضاً لأن هذه الطريقة مفيدة لتعليم الطلاب ذوي المهارات المختلفة. صُنّف الطلاب حسب مستوى مهاراتهم لجعل الطلاب ذوي المهارات العالية والطلاب ذوي المهارات المنخفضة في مجموعة واحدة لاكتساب المهارات من بعضهم البعض.
  - ✧ **تقسيم العمل إلى عمليات صغيرة:** يقسم المعلمون العمل إلى عمليات أصغر، وتوجيه تعليمات للطلاب بعدم القيام بالعملية التالية إلى أن يتحقق المعلمون من تقدمهم في العملية الحالية.
- يقوم المعلمون بتعليم الطلاب ممارسة مراحل العمل الأساسية (مراجعة المتطلبات، والقيام بالعمل، والتأكد من النتائج) بشكل متكرر في كل عملية.

### 3. النتائج

#### رأى معلمي العملي:

قبل إدخال الأنشطة، لم تكن قادرين على تدريب الطلاب ذوي المهارات الأقل للوصول إلى مستوى مهاري عالي. كنا نشرح الدرس لجميع الطلاب دفعة واحدة دون تقسيمهم إلى مجموعات من قبل. بعض الطلاب يفهمون الدرس لكن الآخرين لا يفهمونه. حالياً، يسهل على جميع الطلاب الفهم من خلال التدريس في مجموعات صغيرة. يساعد تقسيم العمل إلى عمليات صغيرة كلاً من المعلمين والطلاب على تأكيد النتائج في كل عملية. وعليه، يمكن للطلاب الحصول على منتجات جيدة في النهاية. عمل ذلك على ازدياد حماس الطلاب وثقتهم بأنفسهم. أيضاً، كما ساهمت تلك الطريقة في تقليل الفارق في المهارات الفنية بين الطلاب.

تحسين جودة منتجات الطلاب: تحسن معدل منتجات الطلاب المصنفة على أنها "جيدة" اعتمادًا على معايير التقييم الياباني من 0% إلى 81% خلال عامين من بدء إدخال الأنشطة.



## الحالة رقم 2: تحسين TM (إدارة الوقت) في مدرسة الدكتور أحمد زويل للتعليم المزدوج للبنات في بورسعيد.

### 1. التحدي

كانت المدرسة تواجه تحديات في الالتزام بالوقت من الطلاب والمعلمين على حد سواء. لم يهتم الطلاب بالالتزام بمواعيد الحصص وإدارة الوقت ولم يكن بعض المعلمين صارمين في هذا الإطار.

### 2. تطبيق الأنشطة النموذجية الموصى بها في الدليل الإرشادي في سبيل ذلك، أدخل المعلمون الأنشطة النموذجية التالية في صفوفهم:



نداء الأسماء باستخدام نظام بطاقات الترتيب

✦ إدخال نظام إدارة الوقت: أدخلت المدرسة النظام الذي أوصى به الدليل الإرشادي (فاصل زمني: استراحة 5 دقائق، وجدول زمني، وساعة حائط، ونظام جرس تلقائي).

✦ تنمية الفهم بين المعلمين: شرح مدير المدرسة أهمية إدارة الوقت والنظام الجديد لتحسين الانضباط على المواعيد لدى المعلمين. وترأس مدير المدرسة اجتماعات صباحية منتظمة لتحسين التفاهم بين المعلمين وإيجاد حلول عملية معًا من خلال تبادل المعلومات والأفكار.

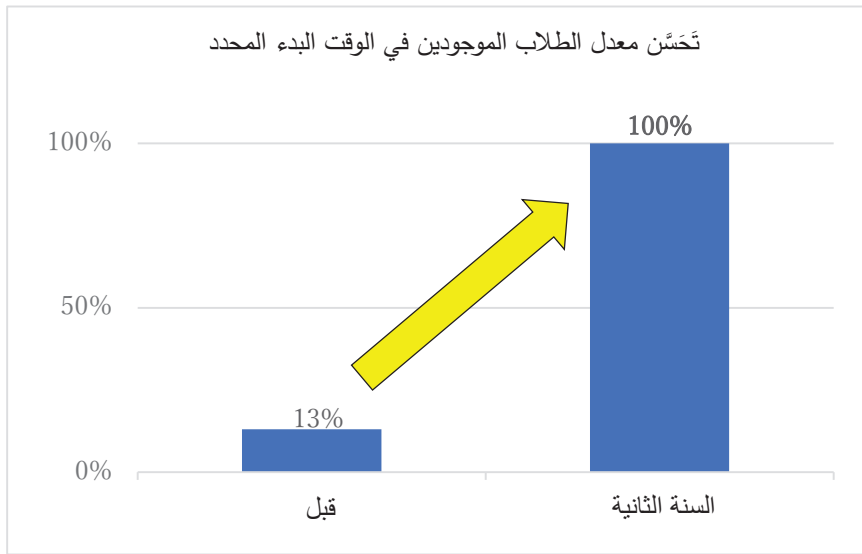
✦ الممارسة والتوجيهات المتكررة: أدخل نظام التسجيل والنداء بالاسم للمتأخرين في كل صف ودرس عملي. أدخل أيضًا "نظام بطاقات الترتيب" أي أن يحمل كل طالب رقم خاص في بداية الدرس من أجل التحقق بسهولة من الحضور والمتأخرين. وطلب المعلمون بشكل متكرر من الطلاب أن يواصلوا متابعة الوقت أثناء الصفوف والدروس لترسيخ نظام إدارة الوقت.

### 3. النتائج:

**كلمة المدير:** أصبح المعلمون واعين بالوقت وأدركوا أن الطلاب لا يمكن أن يكونوا كذلك إلا إذا أصبح المعلمون نموذجاً يُحتذى به. واجهت مقاومة من بعض المعلمين كما كانوا مترددين في تغيير الثقافة. لقد استمعت إليهم بعناية وأجريت معهم محادثة منطقية وهادئة للوصول إلى تفاهم متبادل. أعطيت أيضًا المزيد من الأدوار لبعض المعلمين الذين لديهم شغف للتحسين.

**رأي المعلمين:** تحسّن إدارة وقت الطلاب من خلال النظام الجديد، والالتزام المعلمين بأن يكونوا نموذجاً يُحتذى به، والتشجيع المستمر من خلال إيصال رسالة أهمية احترام الوقت. وكأثر أخرى، زادت الثقة بين إدارة المدرسة، والمعلمين، والطلاب، والآباء، والشركات الشريكة للتعليم المزدوج، حيث أصبح الطلاب أفضل فيما يتعلق بإدارة الوقت. كان هناك رأي من طلاب أن تعلمها الجدارات ساعدها كثيرًا داخل مصانع الشركات الشريكة.

تحسين إدارة وقت الطلاب: تحسّن معدل الطلاب الموجودين في الوقت البدء المحدد من 13% إلى 100% في خلال عامين بعد إدخال الأنشطة.





## الحالة رقم 3: تحسين PR (الإنتاج وفقاً للمواصفات) في قسم الإلكترونيات في مدرسة بورسعيد الثانوية الصناعية للبنات ببورسعيد

### 1. التحدي

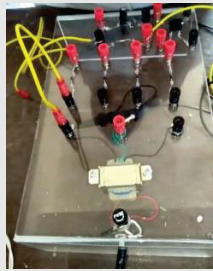
وجد معلمو الإلكترونيات أن طلابهم ليس لديهم اهتمام كبير أو حافز لاداء الدروس العملية، وليس لديهم ثقة بالنفس لقياس المنتج وتقييم أنفسهم بعد الإنتهاء.

### 2. اعتماد وإدخال الأنشطة النموذجية الموصي بها في الدليل الإرشادي في سبيل ذلك، أدخل المعلمون الأنشطة النموذجية التالية في صفوفهم:

✧ **تقسيم العمل إلى عمليات صغيرة:** اعتاد المعلمون على السماح للطلاب بتنفيذ التمرين العملي في دفعة واحدة من البداية إلى النهاية. وبدلاً من ذلك، بدأ المعلمون في تقسيم العمل إلى عمليات صغيرة للسماح للطلاب بممارسة مراحل العمل الأساسية (مراجعة المتطلبات، والقيام بالعمل، والتأكد من النتائج) في كل عملية. وبدأ المعلمون أيضاً في صناعة مكونات التدريب بصفائح الأكريليك وأجزاء الإلكترونيات بأنفسهم تيسيراً للممارسة والتوجيهات المتكررة. في الماضي، كان المعلمون يسمحون للطلاب بصنع دوائر كهربائية عن طريق اللحام. لم تكن طريقة الممارسة والتوجيهات المتكررة سهلة لأنه عادة ما يُستغرق وقتاً لعمل دائرة، ولم يكن من السهل تعديلها بعد اللحام. و عوضاً عن ذلك، جعلت مكونات التدريب الجديدة الممارسة المتكررة أسهل حيث يمكن للطلاب تجميع وتغيير الدوائر فقط عن طريق ربط الأسلاك ووجه المعلمون الطلاب لجعل القياس متكرراً حتى يتمكنوا من التوصل إلى نتائج صحيحة.



الطلاب يعملون على التمرين باستخدام المكونات



مكونات التدريب



المعلمون يقوموا بصنع مكونات التدريب

### 3. النتائج

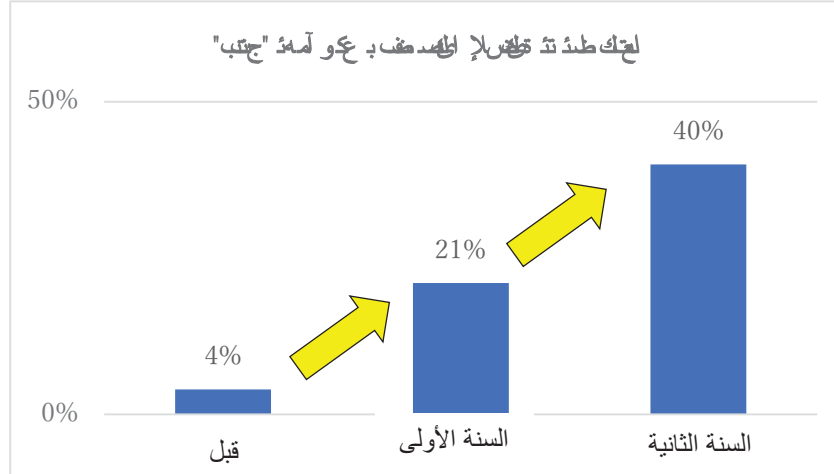
#### كلمة المعلمين العمليين:

أتاح إدخال نشاط تقسيم العمل الي عمليات صغيرة وعناصر التدريب للطلاب ممارسة مراحل العمل الأساسية (مراجعة المتطلبات، والقيام بالعمل، والتأكد من النتائج (القياس) بشكل متكرر. ونتيجة لذلك، أصبح الطلاب واثقين بأنفسهم في تنفيذ الخطوات الأساسية، وأصبحوا أكثر حماسًا. وفي نهاية الممارسة العملية والوصول إلى النتائج، يكون لدى الطلاب شعور بقيمة وفائدة الممارسة العملية. وإنشاء عناصر التدريب ليس مكلفًا، بمجرد إنشاء المكون، من الممكن استخدامه العديد من المرات لعدة أنواع من التمارين مقارنةً بلوحة الدائرة المصنوعة عن طريق اللحام. أصبحت الممارسة والتوجيهات المتكررة ممكنة باستثمار صغير.

#### رأى الطلاب:

شجعنا تقسيم الممارسة العملية إلى العديد من الخطوات الصغيرة وإتاحة الفرصة لقياس كل خطوة على العمل بتقنة خلال الدروس العملية.

تحسين جودة منتجات الطلاب: تحسن معدل منتجات الطلاب المصنفة على أنها "جيدة" اعتمادًا على معايير التقييم الياباني من 4% إلى 40% في غضون عامين بعد إدخال الأنشطة.



## الحالة رقم 4: تحسين PR (الإنتاج وفقاً للمواصفات) في قسم الميكانيكا بالمدرسة العربية للتكنولوجيا التطبيقية في قويسنا.

### 1. التحدي

واجه معلمو الميكانيكا تحديات في البدء في الدروس العملي لأن المعدات والأدوات اللازمة لم يتم إدخالها بالكامل في حين أن المدرسة قد تم إفتتاحها.

### 2. اعتماد وإدخال الأنشطة النموذجية الموصى بها في الدليل الإرشادي

في سبيل ذلك، أدخل المعلمون الأنشطة النموذجية التالية في صفوفهم:



تقسيم الطلاب الي مجموعات صغيرة

✧ تقسيم الطلاب إلى مجموعات صغيرة: بغرض استخدام عدد محدود من المعدات والأدوات بكفاءة، قسم المعلمون 25 طالباً من فصل دراسي واحد إلى ثلاث مجموعات لتدريس ثلاثة مواضيع مختلفة؛ التشطيب اليدوي، لحام الغاز واللحام بالقوس الكهربائي على أساس المعدات والأدوات المتاحة. ووضع المعلمون جدول زمني للدروس على النحو التالي:

مجموعة ج	مجموعة ب	مجموعة أ	
اللحام بالقوس الكهربائي	لحام الغاز	التشطيب اليدوي	أول ثلاث أسابيع
لحام الغاز	التشطيب اليدوي	اللحام بالقوس الكهربائي	ثاني ثلاث أسابيع
التشطيب اليدوي	اللحام بالقوس الكهربائي	لحام الغاز	ثالث ثلاث أسابيع

كل معلم يشرف على كل مجموعة، وكان الطلاب يمارسون مراحل العمل الأساسية من مراجعة المتطلبات، والقيام بالعمل، والتأكد من النتائج على نحو متكرر.



يقوم كل معلم بمتابعة الطلاب عن قرب وتقديم النصائح

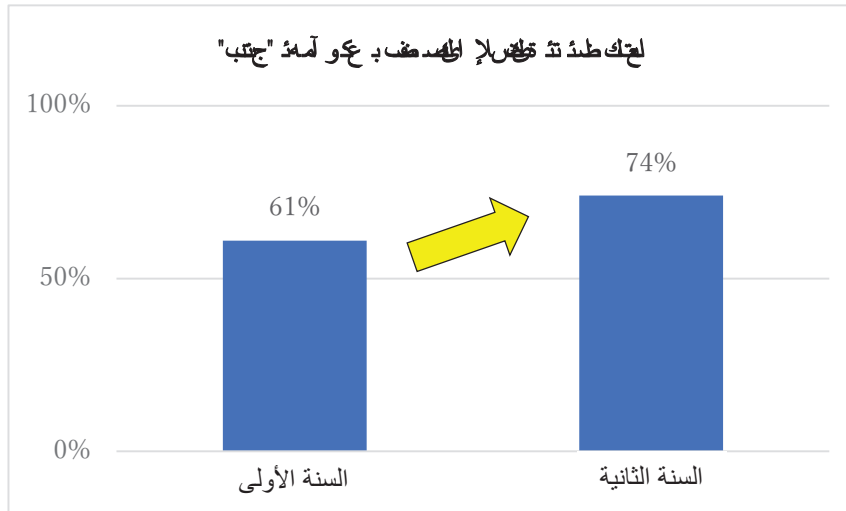
### 3. النتائج

#### رأي المعلمين العملي:

قد ادي تنفيذ نشاط تقسيم الطلاب الي مجموعات صغيرة الي مشاركة في العمل باستخدام الآلات والأدوات المتاحة. واكتسب الطلاب الثقة في استخدام المعدات والآلات من خلال الممارسة المتكررة. ومن الممكن إعادة تدوير المواد الخام القديمة التي تم استخدامها من مجموعة لمجموعة أخرى. وعلى هذا فإن درس المجموعة الصغيرة سوف يكون مفيداً للغاية في تعزيز جدارة الطلاب في مجال PR (الإنتاج وفقاً للمواصفات) في المدارس التي تواجه نقص في الموارد الخام. وكأثار أخرى، ساعد درس المجموعات الصغيرة المعلمين على إيصال المعلومات إلى الطلاب بسهولة وكذلك متابعتهم وتوجيههم ببسر على عكس درس المجموعات الكبيرة.

رأي الطلاب: أعتقد أن الجدارات التي أمدت بها خلال الدروس العملي ستساعدني في المستقبل في مكان العمل.

تحسين جودة منتجات الطلاب: كان معدل منتجات الطلاب المصنفة على أنها "جيدة" اعتماداً على معايير التقييم الياباني من 61% في السنة الأولى ووصل إلى 74% في السنة الثانية بعد إدخال الأنشطة.



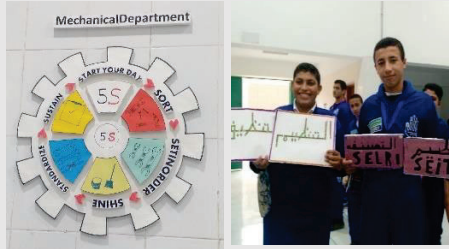
## الحالة رقم 3S:5 (التصنيف/ الترتيب/ التنظيف) في قسم الميكانيكا بالمدرسة العربي للتكنولوجيا التطبيقية في قويسنا

### 1. التحدي

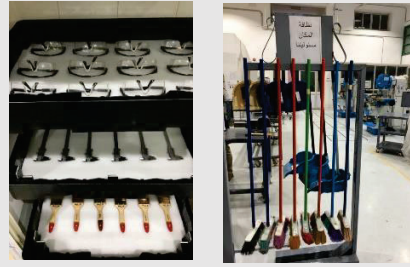
واجه معلمو الميكانيكا تحديات لتعليم وتطبيق طريقة 3S (التصنيف/ الترتيب/ التنظيف) حيث لم يكن هناك مخزن لترتيب الورشة في حين أن المدرسة قد أفتتحت لتوها.

### 2. اعتماد وإدخال الأنشطة النموذجية الموصى بها في الدليل الإرشادي في سبيل ذلك، أدخل المعلمون الأنشطة النموذجية التالية في صفوفهم:

- ❖ ممارسة طريقة 3S (التصنيف/ الترتيب/ التنظيف) في الورشة: نظم المعلمون بيئة ورشة العمل باستخدام الموارد المتاحة مثل الخزائن والصناديق البلاستيكية. وكان للمعلمين أيضًا طلاب مشاركين لزيادة تحفيز الطلاب ومسؤوليتهم تجاه تطبيق طريقة 3S.
- ❖ إنشاء وعرض قواعد طريقة 3S (التصنيف/ الترتيب/ التنظيف): وضع المعلمون قواعد طريقة 3S ونشروا تعليمات مرئية في الورشة.
- ❖ ممارسة والتوجيهات المتكررة: كرر المعلمون ممارسة الطلاب لاختيار الأدوات والأجهزة اللازمة من المخزن في بداية الدرس، والحفاظ على أماكن عملهم مرتبة، وإعادة الأدوات والأجهزة إلى الأماكن الأصلية وتنظيف ورشة العمل في نهاية الدرس.



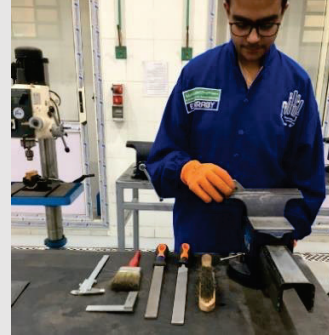
عرض 3S من قبل المعلمين والطلاب



بيئة 3s



يعيد الطلاب الأدوات إلى مكانها الأصلي بعد استخدامها



الطلاب يحافظون على مكان العمل مرتبة أثناء الدرس

### 3. النتائج

رأى معلمى العملى: تعد ممارسة طريقة 3S (التصنيف/ الترتيب/ التنظيف) أمر ممكن باستخدام الموارد المتاحة. ونحن نمارس طريقة 3S في الورشة مع الطلاب، ونطلب منهم ألا يحفظوا الملصق ويكرروه فحسب، بل أيضًا أن يتبادلوا الأفكار من أجل التحسين المستمر لطريقة 3S هذه الطريقة تحفز الطلاب للحفاظ على واتباع قواعد طريقة 3S ومواصلة التحسن.

رأى الطلاب: نعتبر طريقة 3S مساعدة لإدارة الوقت بحيث إذا كُلفت بمهمة محددة، فإنني أرتب الأدوات والآلات بالطريقة التي أستطيع أن أعمل بها بسهولة وكفاءة. بعد الانتهاء من المهمة، قمت بترتيب مكان العمل وإعادة الآلات والأدوات إلى مكانها الأصلي ليكون من السهل العثور عليها مرة أخرى.

تحسين طريقة 3S عند الطلاب: بلغ معدل الطلاب الذين يعيدون الأدوات والمواد إلى الأماكن الأصلية بشكل صحيح بعد الاستخدام 100% فقط في شهر واحد بعد إدخال الأنشطة.

## **Appendix 7**

# **Competencies that Schools and Teachers Can Acquire by Introducing “Guideline for Practical Lesson Improvement”, and Their Evaluation (English /Arabic)**

# Competencies that schools and teachers can acquire by introducing the guidelines, and their evaluation

## 1. Purpose of this document

“The Guideline for Practical Lesson Improvement (hereinafter referred as the Guideline” defined following four main competencies that students should equip during their school days and introduced how to make students equip with four competencies for school and teachers.

- PR: Production according to Request
- SB: Safe Behavior
- 3S: Sort/Set in Order/Shine
- TM: Time Management

However, the Guideline did not show necessary competencies for schools and teachers to introduce the Guidelines at their school. Thus, this document provides those competencies and its evaluation method.

## 2. Audience of this Document

The targeted audiences are school management and teachers of technical secondary schools, Idara/Mudiriya and any supervisor affiliated with technical secondary schools. The school management, teachers and staff can learn necessary competencies to introduce the Guidelines. The evaluator can evaluate the level of schools and teachers and advice improvement by utilizing the evaluation method. The evaluation can be conducted by school management, Idara/Mudiriya and any supervisor, and even among teachers themselves.

## 3. Competency Composition

Practical lesson improvement through the introduction of the Guidelines includes some activities that cannot be achieved by the efforts of a single teacher, for examples; 1) Increase the time to engage in work by introducing a small group (mobilization of many teachers is necessary), 2) Improvement of the training room, 3) Consistent guidance to students by all teachers. Therefore, proper and complete implementation of the Guidelines requires at least departmental, preferably school-wide implementation. In other words, the competencies required to introduce the Guidelines must consist of the following two;

**Organizational Competencies (OC)** :They are competencies that a school or department needs to achieve as an organization.

**Teacher Competencies (TC):** :They are competencies that each teacher should acquire. However, even if only one teacher has mastered it, the effect is low. It has the characteristic that the effects of instruction appear when the majority of teachers acquire and practice it.

Each competency consists of the sub-competencies shown below. To simplify them in this document, the abbreviations OC and TC are given, respectively.

- OC: Organizational competencies
  - WT: Securing students **W**orking **T**ime.
  - VA: **V**isualizing correct **A**ctions in the workshop



- TC: Teacher Competencies
  - RM: Being a **R**ole **M**odel
  - RP: Providing Opportunities for **R**epetitive **P**ractice
  - RI: Providing **R**epetitive **I**nstruction until students can do

## 4. Perspective and Evaluation Method of Each Competency

This chapter describes both perspective and the evaluation method of each competency.

The purpose of the evaluation is NOT to make an assessment that affects personnel evaluation. The purpose of this evaluation is to promote improvement by measuring the current state of the organization and teachers, and to improve school education. Each evaluation consists of three parts: A. Evaluation Name, B. Evaluation Method and C. Evaluation Timing.

### 4.1 OC: Organizational Competencies

#### 4.1.1 WT: Securing students Working Time

##### (1) Perspective

Securing students' working time is the most important factor that directly linked to students' PR competencies. Therefore, ensuring to secure students' working time is the most important organizational competency. To ensure to securing time, organization should do the following:

- **Introducing small groups:** Introducing practical lesson with small groups would decrease the number of students who use equipment/tools at the same time and the time of exposure for using equipment/tools per student increases. This method is effective particularly for departments with a small number of equipment such as mechanical departments.

To practically implement this in conventional school, the school needs to create more than one schedule (timeline) for each group. The teachers need to have a prior consent from the technical subjects' supervisors of Modirriya/Idara to check the status of the practical lesson and the alignment with the timeline of each technical subject.

- **Reducing teacher's absenteeism rate:** There are some cases where the above system cannot be introduced due to the high absenteeism rate of teachers. Thus, Teacher absenteeism is what each school needs to tackle as an organization.
- **Improving Time Management (TM):** By making it a habit to start on time and finish on time, it is possible to eliminate wasted time during class and secure working time for students.

##### (2) Evaluation Method

Measure the students actual work time per 60 min class.

- **When each student works separately:** Simply measure the time a student has worked. Separately here means that each student is working with his/her material, tools and equipment alone without alternating the equipment with other student. For example, in filing process, "if there are many bench vises for each student". At that time select a student as a representative and measure the time he has worked.
- **When multiple students work in a group:** Measure the time of a group engaged in work and then, divide the time measured by the number of students in a group. An example of "multiple students work in a group" is the welding practical class with few numbers of

welding stations. At that time the group of students will use the welding station in alternation. In this case to evaluate the student work time, measure the time of group engagement in work and divide the total time by the number of students in a group.

- **Evaluation Timing:** During the practical lesson observation

#### Remark

- It is not necessary to measure accurately. A rough measurement is enough.
- In each topic, the teacher will explain the theory before the student's work. Evaluation by this measurement cannot be carried out during the theory explanation class. Therefore, it is necessary to select and measure the time of class when the work is performed.

### **4.1.2 VA: Visualizing correct Actions in the workshop**

#### **(1) Perspective**

For students to work correctly in the workshop, it is effective to visualize the correct actions in the workshop so that the students can understand and take correct action immediately by seeing them. The following methods are recommended for visualization: 1) description in sentences, 2) expression with pictures and photographs, 3) both. Visualization of correct actions in the workshop includes at least the following:

- SB (Safe Behavior)
  - Basic dress code
  - Basic standards for safe behavior
  - Standard work environment
- 3S (Sort/Set in Order/Shine)
  - Rules for restoring tools and materials
  - Rules for keeping the workstation/workshop neat
- TM (Time Management)
  - The Timetable
  - Means to show time (Clock or bell with proper maintenance to show correct time always/ ring in accordance with the timetable)

#### Some important Tips :

- Visualize for students to see
- Always update to the latest "correct actions"
- Keep it simple

#### **(2) Evaluation Method**

**Before the practical lesson observation:** Visit the workshop and check if the correct actions in the workshop are visualized so that students can easily find correct actions of the following items easily visually or audibly.

**During the practical lesson observation:** And observe the lesson if the students can follow the correct actions in the workshop in accordance with the above “visualized” items.

## 4.2 TC: Teacher Competencies

### 4.2.1 RM: Being a Role Model

#### (1) Perspective

The teacher is a role model for the students. If the teacher does not practice correct actions, the students will follow it. If the students are not taking correct actions, it is as if the school is demonstrating that its teachers do not take correct actions. Teachers must always be conscious of the students watching teachers, think back on how they are conducting themselves, and make improvements. Each teacher must be a role model for all four competencies listed in the guidelines.

#### (2) Evaluation Method

During the practical lesson observation, Observe a teacher at the following **items**.

- At the beginning of lesson
  - TM: Starts the lesson on time ( 3 min delay is allowed)
  - SB: Follow dress code
- Before actual Work
  - PR: follow basic steps(check requirements) in demonstration
- During actual work
  - SB: Follow SB rule always
  - PR: Follow basic steps (work using correct skill and confirm results frequently) in demonstration
  - 3S: Follow 3S rule always
- Closing
  - TM: Close the lesson before the close time (5 min earlier is allowed)

### 4.2.2 RP: Providing Opportunities for Repetitive Practice

#### (1) Perspective

It is the mission of individual teachers to provide students with opportunities for repetitive practice for all four competencies. The practical lesson model flow in the Guideline (summary) provides teachers with many sample opportunities for repetitive practice.

For TM, SB, and 3S, it is important to increase opportunities for practice and give students the opportunity to reflect on themselves.

For PR, it is important to increase opportunities for basic steps (check requirements—work—confirm results) in order to produce work according to requests. To increase the opportunities for basic steps, it is important not to leave the students to do it alone without basic steps, but to breaking down the work into small processes so that students can repeat and practice the basic steps and they can practice more opportunities for measurement.

#### (2) Evaluation Method

During the practical lesson observation, Observe a teachers' instruction for the following items.

- At the beginning of lesson
  - TM: Take a roll call. Record attendance and tardy.
  - SB: Check if the students follow dress code.
- Before Actual Work

- 3S: Make the students to collect the tools / parts / materials necessary for the work in the lesson.
- During actual work
  - PR: Break down the work into small steps to increase practice of the basic steps.
  - PR: Introduce system so that students can easily and repeatedly confirm the results of their work
- Closing
  - 3S: Make the students to clean the tools, machinery / equipment, and the workshop following the rules for cleaning.
  - 3S: Make the students to restore tools to designated storage locations.

#### **4.2.3 RI: Providing Repetitive Instruction until students can do**

##### **(1) Perspective**

Teachers should both teach repeatedly and give the students the opportunity to practice repeatedly. However, it is possible for teachers not to teach repeatedly, giving students only the opportunity to practice repeatedly. To prevent this, teachers need to provide repetitive instruction.

##### **(2) Evaluation Method**

During the practical lesson observation, observe a teacher at the following items.

- At the beginning of lesson
  - TM: If there is a tardy student, does the teacher ask the reason for tardy and give necessary guidance to increase students' interest in TM?
  - SB: If there is a student who do not follow dress code, does the teacher ask the reason and give necessary guidance to increase students' interest in dress code?
- Before Actual Work
  - PR/SB: If this is the first time for a student, see \*1. If not the first time, tell the summary of \*1 (1: PR: Explains until the students understand: 1) overall work process, 2) the process covered in the lesson, 3) the objective of each work, 4) requirements (specification documents, circuit diagrams, etc.), 5) Basic theory, 6) names and functions of machinery /equipment and tools)
- During actual work
  - PR: Walk around the workshop and ensure the students do their work correctly (e.g., frequently check their work' result to meet the requirement).
  - SB: Walk around the workshop and ensure the student follow SB rules
  - 3S: Walk around the workshop and ensure the student keep clean and neat around their workspace properly
- Closing
  - PR: Does the teacher communicate to all students if there is an example of a serious mistake(e.g. students did not measure frequently and resulted in bad work)?
  - SB: Does the teacher communicate to all students if there is an example of a serious mistake (e.g. wrong safe behavior).
  - 3S: Does the teacher communicate to all students if there is an example of a serious mistake (e.g. no cleaning during work or messy workstation)?

# Evaluation Sheet

Name of School	
Name of Department	
Date	
Evaluator	

**OC: Organizational competencies**

(1) WT: Securing students Working Time: \_\_\_\_\_ min/60 min practical lesson

Tick appropriate grade

- Good: More than 20 min/student
- Fair: 5 minutes or more and less than 20 minutes
- Need improvement: Less than 5 minutes

(2) VA: Visualizing correct Actions in the workshop

Observe the practical lesson and fill in the table below.

SB	3S	TM
Basic dress code <input type="checkbox"/> Visualization <input type="checkbox"/> Feasibility:	Rules for restoring tools and materials <input type="checkbox"/> Visualization <input type="checkbox"/> Feasibility:	The Timetable <input type="checkbox"/> Visualization <input type="checkbox"/> Feasibility:
Basic standards for safe behavior <input type="checkbox"/> Visualization <input type="checkbox"/> Feasibility:	Rules for keeping the workstation/workshop neat <input type="checkbox"/> Visualization <input type="checkbox"/> Feasibility:	Means to show time <input type="checkbox"/> Clock or bell, timetable <input type="checkbox"/> Feasibility:
Standard work environment <input type="checkbox"/> Visualization <input type="checkbox"/> Feasibility:		

**Visualization:** If the correct actions in the workshop are visualized so that students can easily find correct actions

**Feasibility:** observe the lesson if the students can follow the correct actions in the workshop in accordance with the above “visualized” items.

Tick appropriate grade

- Good: All marked (14 marks)
- Fair: More than 10 marked
- Need improvement: Less than 10 marked

(3) TC: Teacher Competencies

Observe the practical lessons, fill in the table on the next page, and summarize below.

No of ☒( No opportunity):\_\_\_\_\_ No of ☑(performed): \_\_\_\_\_ No of ☐(not performed):\_\_\_\_\_

Tick appropriate grade

- Good: The number of "not performed" is zero
- Fair: The number of "not performed" is 1-2
- Need improvement: The number of "not performed" is 3 or more

TC: Teacher Competencies Observation Sheet

	PR	SB	3S	TM
At the roll call		<input type="checkbox"/> RM: Follow dress code <input type="checkbox"/> RP: Check if the students follow dress code. <input type="checkbox"/> RI: If there is a student who do not follow dress code, ask the reason and give necessary guidance to increase students' interest in dress code		<input type="checkbox"/> RM: starts the lesson on time ( 3 min delay is allowed) <input type="checkbox"/> RP: Take a roll call. Record attendance and tardy. <input type="checkbox"/> RI: If there is a tardy student, ask the reason for tardy and give necessary guidance to increase students' interest in TM.
Before Work	<input type="checkbox"/> RM: follow basic steps (check requirements) in demonstration <input type="checkbox"/> PI: If this is the first time for a student, see *1. If not the first time, tell the summary of *1	<input type="checkbox"/> RI: If this is the first time for a student, explains the safety standards related to the work process in the lesson. If not the first time, just tell the summary	<input type="checkbox"/> RP: Make the students to collect the tools / parts / materials necessary for the work in the lesson.	
During work	<input type="checkbox"/> RP: Break down the work into small steps to increase practice of the basic steps. <input type="checkbox"/> RP: Introduce system so that students can easily and repeatedly confirm the results of their work <input type="checkbox"/> RI: Walk around the workshop and ensure the students do their work correctly (e.g., frequently check their work' result to meet the requirement).	<input type="checkbox"/> RM: Follow SB rule always <input type="checkbox"/> RI: Walk around the workshop and ensure the student follow SB rules	<input type="checkbox"/> RM: Follow 3S rule always <input type="checkbox"/> RI: Walk around the workshop and ensure the student keep clean and neat around their workspace properly	
Closing	<input type="checkbox"/> RI: communicate to all students if there is an example of a serious mistake (e.g., students did not measure frequently and resulted in bad work)	<input type="checkbox"/> RI: communicate to all students if there is an example of a serious mistake (e.g., wrong safe behavior).	<input type="checkbox"/> RP: Make the students to clean the tools, machinery / equipment, and the workshop following the rules for cleaning. <input type="checkbox"/> RP: Make the students to restore tools to designated storage locations. <input type="checkbox"/> RI: communicate to all students if there is an example of a serious mistake (e.g., messy workstation)	<input type="checkbox"/> RM: Close the lesson before the close time (5 min earlier is allowed)

\*1: PR: Explains until the students understand: 1) overall work process, 2) the process covered in the lesson, 3) the objective of each work, 4) requirements (specification documents, circuit diagrams, etc.), 5) Basic theory, 6) names and functions of machinery /equipment and tools

Recording example    : Performed (teacher follows)    :No opportunity (if do not find the opportunity for teacher to take that action)

# الجدارات التي يمكن للمدارس والمعلمين الحصول عليها عن طريق تقديم الدليل الإرشادي وطرق تقييمها

## 1. الغرض من هذه الوثيقة

"يحدد الدليل الإرشادي لتحسين الدروس العملية (المشار إليه فيما بعد بالدليل الإرشادي) "، أربعة جدارات رئيسة ينبغي للطلاب التزود بها خلال أيام دراستهم، ويشرح كيف يمكن أن تقوم المدرسة والمعلمين بمساعدة الطلاب على التزود بالأربعة جدارات:

- PR: الإنتاج وفقاً للمواصفات
- SB: السلوك الآمن
- 3S: التصنيف/ الترتيب/ التنظيف
- TM: إدارة الوقت

غير أن الدليل الإرشادي لا يبين الجدارات اللازمة للمدارس والمعلمين من أجل تطبيقه في مدرستهم. وبالتالي، تعرض هذه الوثيقة تلك الجدارات وطرق تقييمها.

## 2. الفئة المستهدفة من هذه الوثيقة

إن الفئة المستهدفة هم إدارة المدارس ومعلمي المدارس الثانوية الفنية والإدارة والمديرية، وأي موجه مرتبط بالمدارس الثانوية الفنية، ويمكن لإدارة المدارس والمعلمين والموظفين أن يتعلموا الجدارات اللازمة لتقديم الدليل الإرشادي. ويمكن للمُقيم تقييم مستوى المدارس والمعلمين واقتراح نقاط التحسين باستخدام طرق التقييم، إلى جانب ذلك، يمكن أيضاً أن تقوم إدارة المدرسة والإدارة أو المديرية، وأي موجه أو معلم بعمل التقييم.

## 3. تكوين الجدارات

إن تحسين الدروس العملية من خلال تطبيق الدليل الإرشادي يشتمل على بعض الأنشطة التي لا يمكن تحقيقها بجهود معلم واحد، على سبيل المثال؛ (1) زيادة الوقت اللازم للممارسة العملية بتقديم طريقة المجموعة الصغيرة (يلزم وجود العديد من المعلمين)، (2) تحسين مكان التدريب، (3) التوجيه المتسق الخالي من التناقض من المعلمين للطلاب. ولذلك، فإن التنفيذ السليم والكامل للدليل يتطلب، على الأقل، التنفيذ على صعيد الإدارات، ويفضل أن يكون على نطاق المدرسة ككل. وبعبارة أخرى، يجب أن تتألف الجدارات المطلوبة لتقديم الدليل الإرشادي من الجدارتين التاليتين:

- الجدارات التنظيمية (OC): وهي جدارات تحتاج أي مدرسة أو إدارة إلى تحقيقها بشكل مؤسسي
- جدارات المعلمين (TC): وهي جدارات ينبغي أن يكتسبها كل معلم. ومع ذلك، فإنه حتى إذا أتقنها معلم واحد، فإن التأثير سيكون ضعيف. ويمتاز هذا بأن آثار توجيهات المعلمين للطلاب تظهر عندما يكتسب أغلبية المعلمين الجدارات ويمارسونها

تتألف كل جدارة من الجدارات الفرعية المبينة أدناه، ولتبسيطها في هذه الوثيقة، فقد تم وضع الاختصارين التاليين.

- OC: الجدارات التنظيمية

- WT: توفير وقت كافٍ للممارسة العملية للطلاب

- VA: العرض المرئي للإجراءات الصحيحة في ورشة العمل

- TC: جدارات المعلمين
- RM: أن يكون المعلم قدوة
- RP: إتاحة الفرص للممارسة المتكررة
- RI: تقديم توجيهات متكررة إلى أن يتمكن الطلاب من الأداء علي نحو مُرضٍ

#### 4. منظور وطريقة تقييم كل جدارة

يصف هذا الفصل منظور كل جدارة وطريقة تقييمها إن الغرض من التقييم ليس للتأثير على تقييم الموظفين، فالغرض من هذا التقييم هو تعزيز التحسين عن طريق قياس الوضع الحالي للمؤسسة والمعلمين، وتحسين التعليم المدرسي. حيث يتألف كل تقييم من ثلاثة أجزاء: (أ) اسم التقييم، (ب) طريقة التقييم، (ج) توقيت التقييم

#### 1-4 OC: الجدارات التنظيمية

1-1-4 WT: توفير الوقت الكافي للممارسة العملية للطلاب.

#### (1) المنظور

يعد توفير الوقت الكافي لعمل الطلاب هو العامل الأكثر أهمية الذي يرتبط ارتباطاً مباشراً بجدارة "PR لدى الطلاب . وبالتالي فإن توفير الوقت الكافي لعمل الطلاب هو أهم جدارة تنظيمية. ولضمان توفير الوقت، ينبغي للمؤسسة عمل ما يلي:

- تقديم الدروس العملية في مجموعات صغيرة: إن تقديم دروس عملية في مجموعات صغيرة يقلل من عدد الطلاب الذين يستخدمون المعدات أو الأدوات ويزيد من وقت الممارسة العملية باستخدام المعدات والأدوات، وتعتبر هذه الطريقة فعالة بصفة خاصة بالنسبة للأقسام التي لديها عدد قليل من المعدات مثل أقسام الميكانيكا

ولتنفيذ هذا عملياً في المدارس التقليدية، تحتاج المدرسة إلى عمل أكثر من (جدول زمني) واحد لكل مجموعة من الطلاب مما يستلزم أن يحصل المعلمون على موافقة مسبقة من الموجهين الفنيين في المديرية والادارة للتحقق من حالة الدرس العملي واتساقه مع الجدول الزمني لكل موضوع في.

- خفض معدل غياب المعلمين: هناك بعض الحالات التي لا يمكن فيها تطبيق النظام المذكور أعلاه بسبب ارتفاع معدل غياب المعلمين. وهكذا، فإن تغيب المعلمين هو ما تحتاج كل مدرسة لمعالجته كمؤسسة
- تحسين إدارة الوقت: عن طريق تكوين عادة ثابتة للبدء والانهاء من الحصة في الوقت المحدد، وبالتالي القضاء على الوقت الضائع أثناء الحصة وتوفير وقت العمل للطلاب

#### (2) طريقة التقييم

ينبغي قياس وقت العمل الفعلي للطلاب في الفصل لكل 60 دقيقة

- عندما يعمل كل طالب بشكل فردي: طريقة التقييم هي ببساطة قياس الوقت الذي عمل فيه الطالب، ويقصد بفردي هنا هو أن كل طالب يعمل بمفرده من خلال استخدام مواده وأدواته ومعداته دون تبادل المعدات مع طالب آخر. على سبيل المثال، في عملية البرادة، "إذا كان هناك العديد من المناجل لكل طالب." ففي ذلك الوقت يتم اختيار طالب واحد وقياس الوقت الذي عمل فيه على المنجلة
- عندما يعمل أكثر من طالب في مجموعة: طريقة التقييم هي قياس وقت المجموعة المنخرطة في العمل ثم تقسيم الوقت المقاس على عدد الطلاب في المجموعة. مثال علي ذلك وجود القليل من معدات اللحام في حصة اللحام



العملي، وفي ذلك الوقت سيقوم مجموعة من الطلاب باستخدام معدات اللحام بالتناوب . لتقييم وقت عمل الطالب في هذه الحالة يتم قياس وقت المشاركة الجماعية في العمل وتقاسم الوقت الإجمالي على عدد الطلاب في مجموعة ما

- توقيت التقييم: أثناء ملاحظة الدرس العملي

#### ملحوظة

- ليس من الضروري القياس بدقة، ولكن يكفي القياس التقريبي
- يشرح المعلم في كل موضوع الجزء النظري قبل تنفيذ الطالب للشق العملي. ولا يمكن إجراء التقييم بهذا القياس خلال وقت الشرح النظري. ولذلك، من الضروري اختيار وقت الفصل وقياسه عندما يبدأ الطلاب بالتنفيذ العملي للتمارين

#### 2-1-4 VA - : العرض المرئي للإجراءات الصحيحة في ورشة العمل

##### (1) المنظور

ولكي يتمكن الطلاب من العمل بشكل صحيح في ورشة العمل، من المهم العرض المرئي للإجراءات الصحيحة في ورشة العمل حتى يتمكن الطلاب من فهم واتخاذ الإجراءات الصحيحة فوراً عن طريق رؤيتهم الطرق التالية الموصي بها للعرض: (1) وصف مكتوب، (2) رسومات أو صور، (3) عرض رسومات أو صور بجانب الوصف المكتوب. ويتضمن العرض المرئي للإجراءات الصحيحة في ورشة العمل على الأقل ما يلي:

- SB (السلوك الآمن)
  - قواعد الزي
  - المعايير الأساسية للسلوك الآمن
  - بيئة عمل معيارية
- S3 (التصنيف/ الترتيب/ التنظيف)
  - قواعد إعادة الأدوات والمواد
  - قواعد الاحتفاظ بمكان وورشة العمل نظيفة و مرتبة.
- TM إدارة الوقت
  - الجدول الزمني
  - وسائل لإظهار الوقت (الساعة أو الجرس مع الصيانة المناسبة لإظهار الوقت الصحيح دائماً والجرس وفقاً للجدول الزمني)

#### بعض النصائح المهمة :

- عرض الإجراءات بشكل مرئي يسهل للطلاب رؤيته.
- التحديث الدائم "للإجراءات الصحيحة"
- كتابة الإجراءات بشكل مبسط

##### (2) طريقة التقييم

قبل ملاحظة الدرس العملي: القيام بزيارة الورشة والتحقق من اتباع الإجراءات الصحيحة في الورشة مرئية بحيث يتمكن الطلاب بسهولة من رؤية الإجراءات الصحيحة للبنود التالية بسهولة بصرية أو سمعية.

في أثناء ملاحظة الدرس العملي: القيام بمراقبة الدرس والتحقق من اتباع الطلاب للإجراءات الصحيحة في ورشة العمل وفقاً للبنود "المرئية" أعلاه.

#### TC 2-4: جدارات المعلمين

#### RM 4-2-1 : أن تكون قدوة

##### (1) المنظور

المعلم هو قدوة للطلاب. وإذا لم يمارس المعلم الإجراءات الصحيحة، فإن الطلاب سيتبعونه. وإذا كان الطلاب لا يتخذون إجراءات صحيحة، فإن المدرسة ستثبت أن أساتذتها لا يتخذون إجراءات صحيحة. ولهذا يجب أن يكون المعلمون دائماً على وعي بأن الطلاب يراقبون المعلمين، والتفكير مرة أخرى في تصرفاتهم، وإجراء التحسينات على تلك التصرفات. ويجب أن يكون كل معلم نموذجاً يحتذى به في جميع الجدارات الأربع المدرجة في الدليل الإرشادي

##### (3) طريقة التقييم

أثناء ملاحظة الدرس العملي، قم بمراقبة المعلم في البنود التالية

- في بداية الدرس
  - TM: يبدأ الدرس في الوقت المحدد (يسمح بتأخير 3 دقائق)
  - SB: اتباع قواعد الزي
- قبل بدأ العمل الفعلي
  - PR: اتباع الخطوات الأساسية (التحقق من المتطلبات) في الشرح
- أثناء العمل الفعلي
  - SB: اتباع قاعدة SB دائماً
  - PR: إتباع الخطوات الأساسية (في العمل باستخدام المهارات الصحيحة والتأكيد على النتائج بشكل متكرر) في الشرح
  - 3S: اتباع قاعدة 3S دائماً
- في نهاية الحصة
  - TM: إنهاء الدرس قبل انتهاء الوقت بمدة قليلة (يسمح بخمس دقائق قبل انتهاء الوقت)

#### RP 2-2-4: إتاحة الفرص للممارسة المتكررة

##### (1) المنظور

وتتمثل مهمة كل معلم في إتاحة الفرص للطلاب للممارسة المتكررة لكافة الجدارات الأربعة، إن نموذج سير الدروس العملية الموجود في الدليل الإرشادي (الملخص) يقدم للمعلمين العديد من النماذج لزيادة فرص الممارسة المتكررة

ومن المهم بالنسبة SB, TM, 3S زيادة فرص الممارسة وإتاحة الفرصة للطلاب للتفكير وتصرفاتهم وتقييمها

أما فيما يتعلق بال PR، من المهم زيادة فرص ممارسة الخطوات الأساسية (التحقق من المتطلبات والعمل وتأكيد النتائج) من أجل إنتاج منتج وفقاً للمتطلبات. ولزيادة فرص ممارسة الخطوات الأساسية، من المهم عدم ترك الطلاب يفعلون ذلك بمفردهم بدون الخطوات الأساسية، بل تقسيم العمل إلى عمليات صغيرة حتى يتمكن الطلاب من تكرار وممارسة الخطوات الأساسية ويزيد من فرصهم للقيام بعملية القياس للمنتج

##### (2) طريقة التقييم

في أثناء ملاحظة الدرس العملي، القيام بملاحظة طريقة المعلمين في التوجيه للبنود التالية

- في بداية الدرس  
 TM : النداء على الطلاب و تسجيل الحاضر والمتغيب.  
 SB : التحقق مما إذا كان الطلاب يتبعون قواعد الزي
  - قبل بدأ العمل الفعلي  
 3S : يجب التنبيه على الطالب بجمع الأدوات والأجزاء والمواد اللازمة للعمل في الدرس
  - أثناء العمل الفعلي  
 PR : تقسيم العمل إلى خطوات صغيرة لزيادة ممارسة الخطوات الأساسية  
 PR : تقديم نظام لكي يتمكن الطلاب من تأكيد نتائج عملهم بسهولة وبشكل متكرر
  - في نهاية الحصة  
 3S : الحرص على جعل الطلاب ينظفون الأدوات والآلات والمعدات ، واتباع قواعد التنظيف في ورشة العمل  
 3S : الحرص على جعل الطلاب يعيدون الأدوات إلى أماكن التخزين المحددة
- RI 4-2-3: تقديم توجيهات متكررة حتى يتمكن الطلاب من الأداء

### (1) المنظور

ينبغي أن يقوم المعلمون بتوجيه الطلاب مرارًا وتكرارًا وأن يتيحوا الفرصة لهم للممارسة العملية مرارًا وتكرارًا. ومع ذلك، يمكن أن نجد في بعض الأحيان أن المعلمون لا يقومون بتوجيه الطلاب مرارًا وتكرارًا، مكتفين بإتاحة الفرصة للطلاب للممارسة العملية مرارًا وتكرارًا. ولتجنب ذلك، يجب أن يقدم المعلمون بتوجيه الطلاب بشكل متكرر.

### (2) طريقة التقييم

أثناء ملاحظة الدرس العملي، يتم مراقبة المعلم في البنود التالية

- في بداية الدرس  
 TM : إذا كان هناك طالب متأخر، هل يسأل المعلم عن سبب التأخر ويعطي التوجيه الضروري لزيادة اهتمام الطلاب بال TM؟  
 SB : إذا كان هناك طالب لا يتبع قواعد الزي، فهل يسأل المعلم عن السبب ويعطي التوجيه اللازم لزيادة اهتمام الطلاب بقواعد الزي؟
- قبل بدأ العمل الفعلي  
 PR/SB : إذا كانت هذه هي المرة الأولى للطالب في الحصة العملي، انظر 1. إن لم تكن المرة الأولى، انظر الملخص 1 (PR: 1 يشرح المعلم حتى يفهم الطلاب: 1) اجمالي مراحل العمل في التمرين، (2) المرحلة التي سوف يقوم الدرس بتغطيتها في الحصة، (3) هدف كل عمل، (4) المتطلبات (وثنائق المواصفات ومخططات الدوائر، إلخ)، (5) النظرية الأساسية، (6) أسماء ووظائف الآلات والمعدات والأدوات
- أثناء العمل الفعلي  
 PR : التجول في ورشة العمل وضمان قيام الطلاب بأعمالهم بشكل صحيح (على سبيل المثال ، متابعة إذا كان الطلاب يتحققوا من نتيجة عملهم "لتلبية المتطلبات الخاصة بالتمرين)  
 SB : التجول في ورشة العمل وضمان اتباع الطالب لقواعد SB  
 3S : التجول في ورشة العمل وضمان الحفاظ على نظافة الطلاب ونظافتهم حول مكان عملهم كما ينبغي
- في نهاية الحصة:

□ PR: هل يتواصل المعلم مع كل الطلاب إذا كان هناك مثال على خطأ جسيم (على سبيل المثال) الطلاب لم يقيسوا بشكل متكرر وأسفر ذلك عن عمل سيء؟

□ SB: هل يتواصل المعلم مع كل الطلاب إذا كان هناك مثال على خطأ جسيم (مثل الخطأ في إدارة الأمن والسلامة)

□ 3S: هل يتواصل المعلم مع جميع الطلاب إذا كان هناك مثال على خطأ جسيم (مثل عدم التنظيف أثناء العمل أو مكان العمل الفوضوي)؟

## ورقة التقييم

اسم المدرسة	
اسم القسم	
التاريخ	
المُقيم	

OC: الجداريات التنظيمية

(1) WT: توفير الوقت الكافي للممارسة العملية : \_\_\_\_\_ 60-دقيقة في الدرس العملي

ضع علامة على الدرجة المناسبة

- جيد أكثر من 20 دقيقة /طالب
- مقبول 5دقائق أو أكثر أو أقل من 20 دقيقة
- تحتاج إلى تحسين: أقل من 5 دقائق

(2) VA: العرض المرئي للإجراءات الصحيحة في ورشة العمل

قم بمراقبة الدرس العملي وأملأ الجدول أدناه

TM	3S	SB
الجدول الزمني <input type="checkbox"/> مرئي <input type="checkbox"/> الجدوى:	قواعد نقل الأدوات والمواد <input type="checkbox"/> مرئية <input type="checkbox"/> الجدوى:	قواعد الري الأساسي <input type="checkbox"/> مرئية <input type="checkbox"/> الجدوى:
وسائل لإظهار الوقت <input type="checkbox"/> الساعة أو الجرس، الجدول الزمني <input type="checkbox"/> الجدوى:	قواعد الحفاظ علي مكان وورشة العمل نظيفة و مرتبة <input type="checkbox"/> مرئية <input type="checkbox"/> الجدوى:	المعايير الأساسية للسلوك الآمن <input type="checkbox"/> مرئية <input type="checkbox"/> الجدوى:
		بيئة عمل معيارية <input type="checkbox"/> ال مرئية <input type="checkbox"/> الجدوى:

مرئي: إذا تم عرض الإجراءات الصحيحة في الورشة سوف يتمكن الطلاب بسهولة من معرفة الإجراءات الصحيحة بشكل مرئي. الجدوى: القيام بملاحظة الدرس ومدى تمكن الطلاب من إتباع الإجراءات الصحيحة في الورشة وفقا للبندود "المرئية" المذكورة أعلاه.

ضع علامة على الدرجة المناسبة

- جيد جميع الدرجات المحددة (14 درجة)
- مقبول أكثر من 10 درجات
- تحتاج إلى تحسين: أقل من 10 درجات

(3) TC: جداريات المعلمين

مراقبة الدروس العملية، ومأ الجدول في الصفحة التالية، وتلخص أدناه.

عدد علامة  (لا يوجد فرصة للتنفيذ) \_\_\_\_\_ عدد علامة  (تم التنفيذ) \_\_\_\_\_ عدد علامة  (لم يتم التنفيذ) \_\_\_\_\_

ضع علامة على الدرجة المناسبة

- جيد
- مقبول
- تحتاج إلى تحسين:
- العدد "غير المنفذ" صفر
- العدد "غير المنفذ" من 1-2
- العدد "غير المنفذ" 3 أو أكثر

TM	35	SB	PR	
<input type="checkbox"/> RM: يبدأ المعلم الدرس في الوقت المحدد (يسمح بتأخير 3 دقائق) <input type="checkbox"/> RP: النداء وتسجيل الحضور والغياب <input type="checkbox"/> RI: إذا كان هناك طالب متأخر ، يجب سؤاله عن سبب التأخير وتقديم التوجيه اللازم لزيادة اهتمام الطلاب بال TM.		<input type="checkbox"/> RM: إتباع المعلم لقواعد الزي <input type="checkbox"/> RP: التحقق مما إذا كان الطلاب يتبعون قواعد الزي <input type="checkbox"/> RI: إذا كان هناك طالب لا يتبع قواعد الزي ، يجب أن يتم سؤاله عن السبب ويعطى التوجيه اللازم لزيادة اهتمام الطلاب بقواعد الزي		عند النداء علي الحضور والغياب
	<input type="checkbox"/> RP: التنبيه على الطلاب بجمع الأدوات والأجزاء والمواد اللازمة التي يتم استخدامها في الدرس.	<input type="checkbox"/> RI: إذا كانت هذه هي المرة الأولى للطلاب ، يشرح معايير السلامة المتصلة بإجراءات العمل في الدرس وإذا لم تكن المرة الأولى ، يتم شرح الملخص	<input type="checkbox"/> RM: إتباع المعلم الخطوات الأساسية (التحقق من المتطلبات) عند الشرح <input type="checkbox"/> RI: إذا كانت هذه هي المرة الأولى للطلاب في الحصة العملي ، انظر 1. إذا لم تكن المرة الأولى ، أنظر الملخص 1	قبل بدأ العمل
	<input type="checkbox"/> RM: اتباع المعلم لقاعدة SB دائما <input type="checkbox"/> RI: التجول في ورشة العمل وضمان الحفاظ على نظافة وأناقة الطلاب في مكان عملهم بشكل صحيح	<input type="checkbox"/> RM: اتباع المعلم لقاعدة SB دائما <input type="checkbox"/> RI: التجول في ورشة العمل وضمان اتباع الطالب لقواعد SB	<input type="checkbox"/> RP: تقسيم العمل إلى خطوات صغيرة لزيادة ممارسة الخطوات الأساسية. <input type="checkbox"/> RP: تقديم نظام يمكن الطلاب من تأكيد نتائج عملهم بسهولة وبشكل متكرر. <input type="checkbox"/> RI: التجول في ورشة العمل وضمان أداء الطلاب لعملهم بشكل صحيح (على سبيل المثال ، هل يقوم الطلاب بالتحقق من نتيجة عملهم لتلبية المتطلبات الخاصة بالتمرين).	أثناء العمل
<input type="checkbox"/> RM: إنهاء المعلم الدرس قبل انتهاء الوقت بقليل (يسمح بخمس دقائق قبل انتهاء الوقت)	<input type="checkbox"/> RP: التنبيه على الطلاب بتنظيف الأدوات والألات والمعدات ، ورشة العمل تبعاً لقواعد التنظيف. <input type="checkbox"/> RP: التنبيه على الطلاب بإعادة الأدوات إلى مواقع التخزين المحددة. <input type="checkbox"/> RI: التواصل مع جميع الطلاب إذا كان هناك مثال على خطأ جسيم (على سبيل المثال ، مكان العمل الفوضوي)	<input type="checkbox"/> RI: التواصل مع جميع الطلاب إذا كان هناك مثال على خطأ جسيم (مثل الخطأ في إدارة الأمن والسلامة).	<input type="checkbox"/> RI: التواصل مع جميع الطلاب إذا كان هناك مثال على خطأ جسيم (على سبيل المثال ، الطلاب لم يقيسوا بشكل متكرر وأسفر ذلك عن عمل سيء)	نهاية الحصة

1\* PR يشرح المعلم حتى يفهم الطلاب: (1) إجمالي مراحل العمل في التمرين ، (2) المرحلة التي سوف يقوم الدرس بتغطيتها في الحصة ، (3) الهدف من كل عمل ، (4) المتطلبات (وئائق المواصفات و مخططات الدوائر ، إلخ) ، (5) النظرية الأساسية ، (6) أسماء ووظائف الألات والمعدات والأدوات

تسجيل مثال  تم التنفيذ: (من خلال اتباع المعلم)  لا يوجد فرصة (في حالة عدم وجود فرصة للمعلم لاتخاذ أي إجراءات).

## **Appendix 8**

**Training Presentation Material for  
“Guideline for Practical Lesson  
Improvement” (English/Arabic)**



# What does Industry want

Talents who have Competency

1

## What is Competency

a combination of:

1. Knowledge
2. Skills based on the knowledge
3. Sense of purpose and attitude to perform using the knowledge and skills to do something.

2

### **Purpose of This Guideline**

- 1. To help principals and teachers at technical secondary schools, especially industrial secondary schools, understand competencies that students should acquire in their school days**
- 2. Shows the methods of practical lesson improvement to achieve this goal.**

3

## **Guideline Video 1**

4

## Main 4 competencies (Students should acquire)

1. PR: Production according to request
2. SB: Safe Behavior
3. 3S: Sort/Set in Order/Shine
4. TM: Time Management

5

Do you think that those competencies complement one another?



6

How do you think the school can foster a sense of purpose in students?



7

How students may acquire competency?

- Teachers have the students do “repetitive practice” and give them “repetitive instruction” to enable them to acquire Competency

8

## When may teachers instruct repetitively for repetitive practice?



Start?

During?

After?

Discussion



9

## Guideline Video 6

10

## Competency 1:PR

What is PR?

Independently perform the basic steps (check requirements – work – confirm results) in order to produce work according to requests.

11


## **Guideline Video 2**

12

## How do teachers prepare for instructing PR

**1. Practical Lesson Plan.** (allow students to experience more repetitive practice of the basic steps ).


Small group




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Hard Topic

Easy Topic



---



Student basic academic level

13

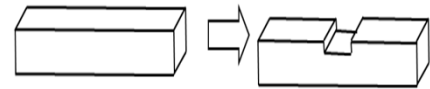
## Group activity

- Each group reads the Examples of practical lesson plans (according to the type of school) and discuss together its logic (5minutes).

14

## How do teachers prepare for instructing PR

2. **Improvement of Lesson Plan:** Break down the work into small processes to increase practice of the basic steps.



### Example 1A

Use a file to produce the work piece on the right from the material on the left.

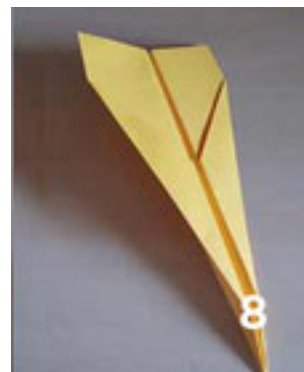


How to Improve this example?

15

## Group activity

From the material on the left make the paper plane on the right

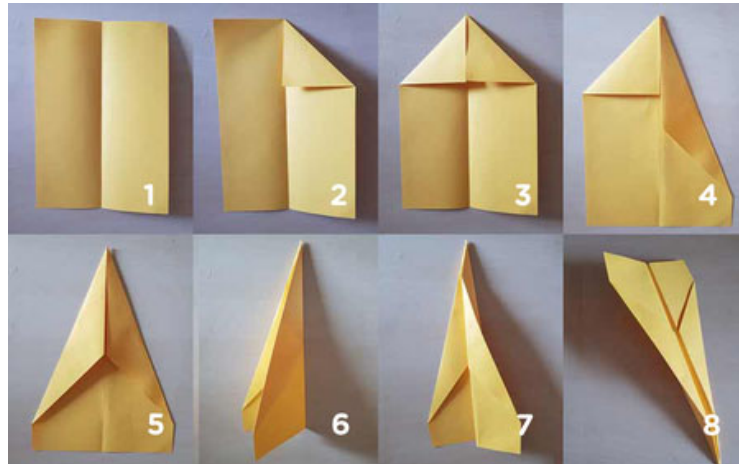


16



## Group activity

Following the steps shown in the photo below, create a paper plane



17

## Group activity

- Each group imagine any lesson and present how they can break down the work into small process to increase the practice of the basic steps. (15 min)

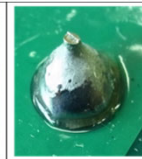
18

## How do teachers prepare for instructing PR

3. Develop a system so that students can easily and repeatedly confirm the results of their work



Example of a neat soldering



Bad example (excessive volume of soldering)



Bad example (excessive heat)



19

## When may teachers instruct repetitively for repetitive practice?



Start?

During?

After?

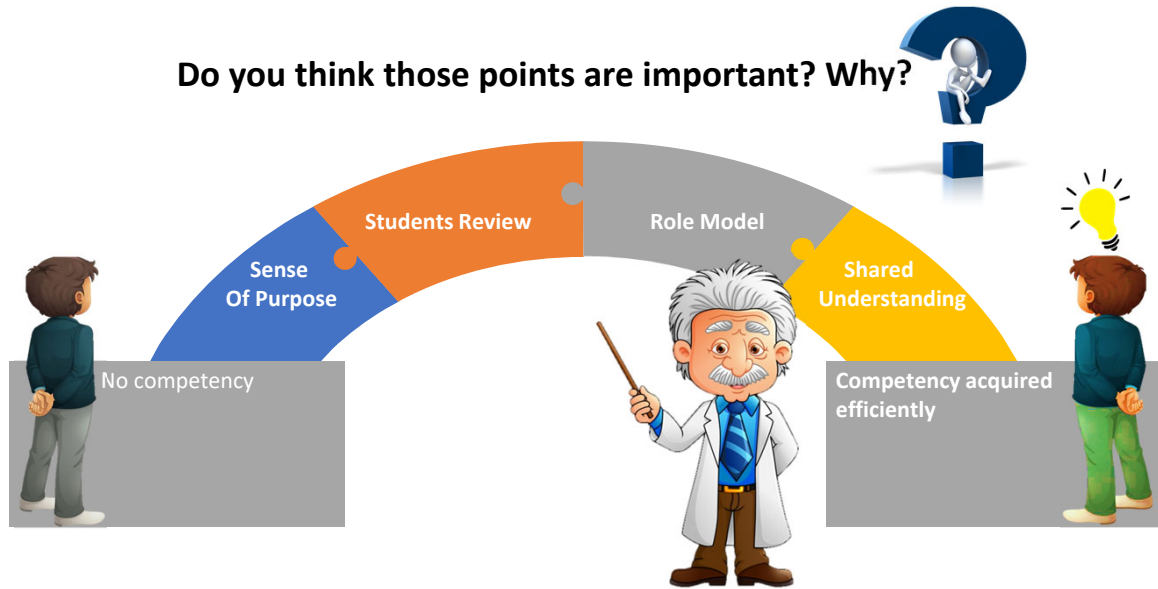
Discussion



20

# Repetitive practice and repetitive instruction considerations

Do you think those points are important? Why?



21

## Competency 2:SB

What is SB?

Independently perform safe behavior to ensure safety at corporate manufacturing sites.

22

# Guideline Video 3

23

## How do teachers prepare for instructing SB



- 1. Create and display a basic dress code

24

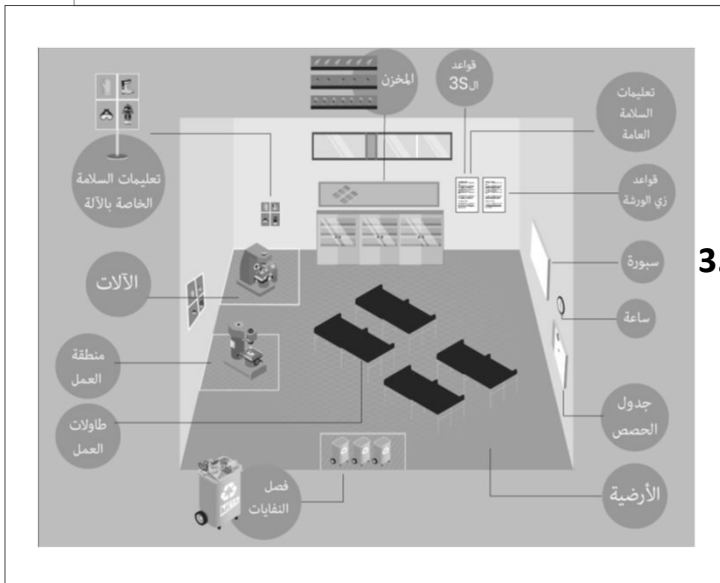
## How do teachers prepare for instructing SB



2. Create and display basic standards for safe behavior

25

## How do teachers prepare for instructing SB



3. Create a standard work environment

26

# When & How may teachers instruct repetitively for repetitive practice of SB?



Start?

During?

After?

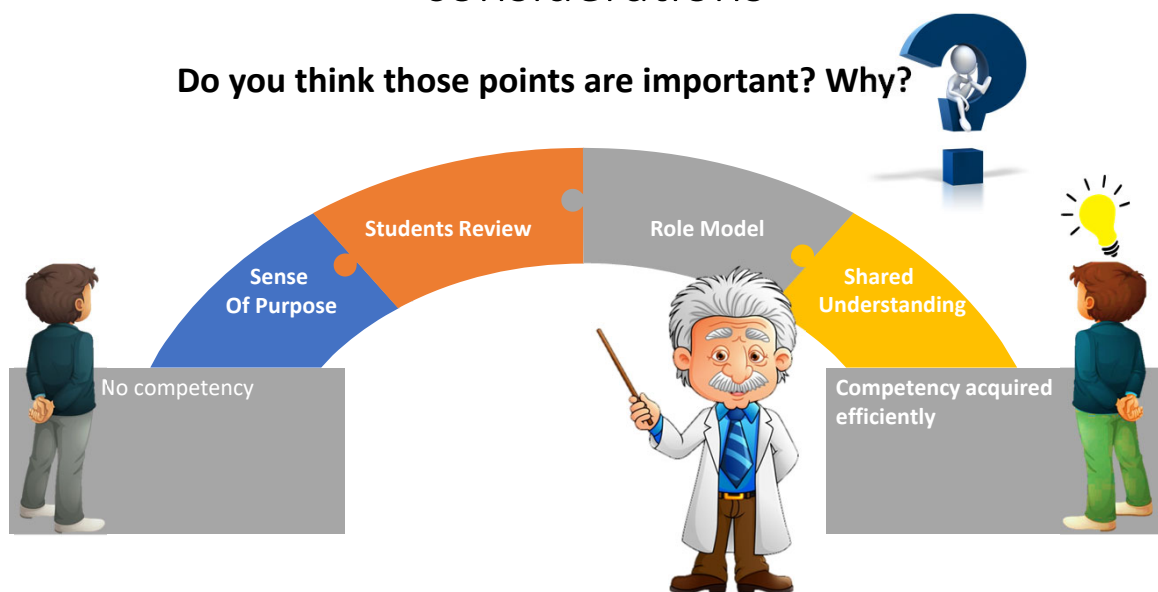
Discussion



27

## Repetitive practice and repetitive instruction considerations

Do you think those points are important? Why?



28

## Competency 3:3S

What is 3S?

Independently perform sort/set in order/shine at the workshop to increase product quality and to enable work efficiency.

29

## **Guideline Video 4**

30

## How do teachers prepare for instructing 3S

1. Teachers themselves practice Sort/ Set in order/ Shine in the workshop (Sort/Set in order/Shine)



31

## How do teachers prepare for instructing 3S

2. Create and display rules of Sort/ Set in order/ Shine (Standardize)



32



## How do teachers prepare for instructing 3S

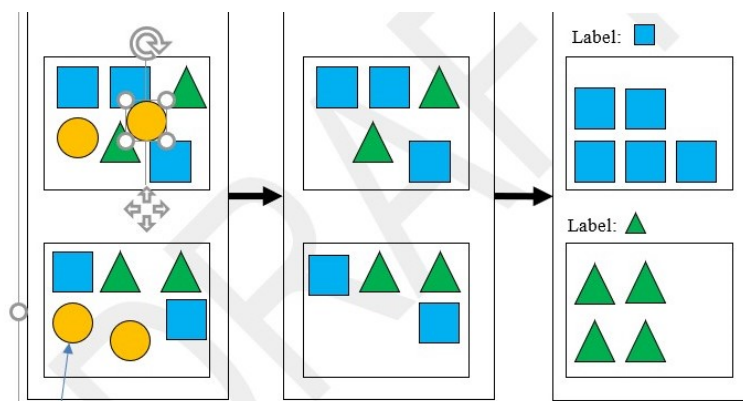
### 3. Hold initial student trainings (Sustain)



33

Group discussion, 5 minutes

5S Game



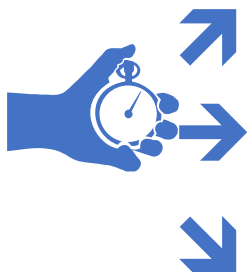
34

Do you think 5S is related to safety?



35

When & How may teachers instruct repetitively for repetitive practice of 3S?



Start?

During?

After?

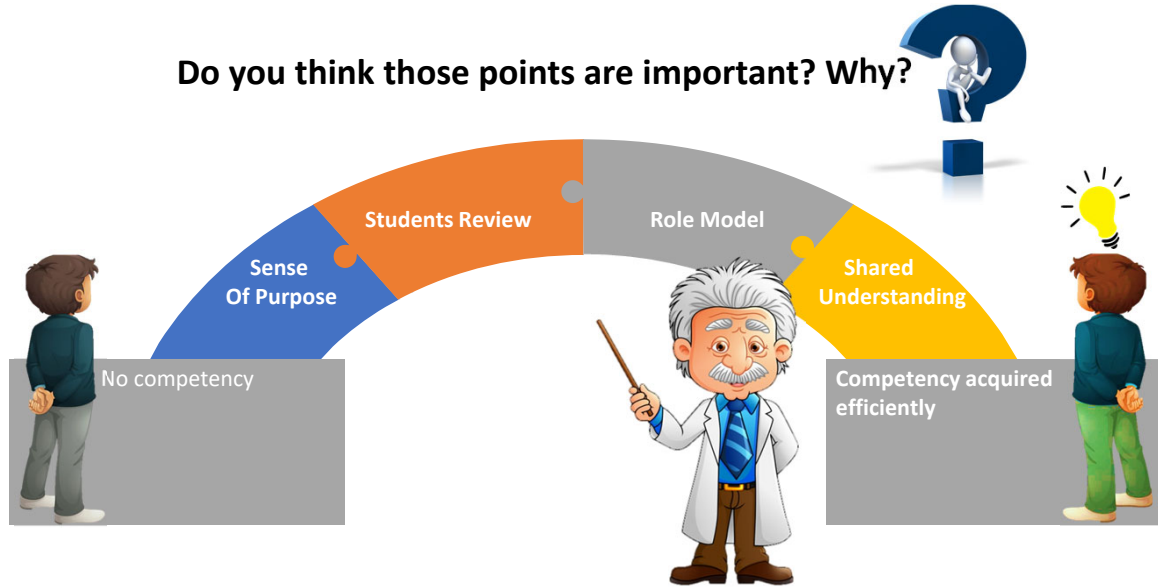
Discussion



36

# Repetitive practice and repetitive instruction considerations

Do you think those points are important? Why?



37

## Guideline Video 6

38

## Competency 4:TM

### What is TM?

- Independently perform time management expected at companies.



39

## Guideline Video 5

40

## How do teachers prepare for instructing TM

1. Create the standard of preparation time to the next class and communicate to students



41

## How do teachers prepare for instructing TM

2. Introduce system that allows the teachers and the students to know the time to start the next class



42

## How do teachers prepare for instructing TM

3. Communicate to the students what responses are to be provided if they fail to follow the standard for time management behavior (tardiness)



43

Who do you think should tackle TM?



44

# When & How may teachers instruct repetitively for repetitive practice of TM?



Start?

During?

After?

Discussion



45

## Repetitive practice and repetitive instruction considerations

Do you think those points are important? Why?



Students' lifestyle



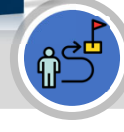
Student self review



Role Model



Shared understanding



Sense Of Purpose



No competency



Competency acquired efficiently



46

## Partnering with companies

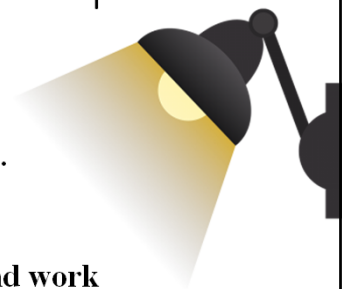


47

What are the goals to partner with companies?

**1- To enable the teachers to understand the needs of the companies.**

**2- To enable the teachers to understand the hiring requirements and work conditions at the companies.**



48



How do you  
think school can  
find companies  
to partner with

---



49

What activities can be done in partnership  
with companies?



50

## Standard Implementation Process for This Guideline

### A) Preparation

1. In-school training
2. Preparation at the departments for practical lessons
3. Preparation to instruct "TM"
4. Setting goals for each competency
5. Communicate to parents/guardians

### B) Implementation

1. Students orientation
2. Implementation of improved practical lessons

### C) Review & Report

1. Measuring/recording
2. Assessment of practical lessons
3. Infor sharing
4. Reporting to Idara/Mudiriya/MOETE

51

## A) Preparation

1. In-school training
2. Preparation at the departments for practical lessons
3. Preparation to instruct "TM"
4. Setting goals for each competency
5. Communicate to parents/guardians

52

# Preparation

In-school training

Preparation at the departments for practical less

Preparation to instruct "TM"

Setting goals for each competency

Communicate to parents/guardians



## **Persons concerned and their roles:**

Person-in-charge	Main roles
Principal	<ul style="list-style-type: none"> <li>✓ Person responsible for holding the in-school training</li> <li>✓ Assessment of the activity</li> </ul>
Teachers who participated in MOETE training	<ul style="list-style-type: none"> <li>✓ Hold the in-school training</li> </ul>



## **Evidence to keep**

In-school training records

53

# Preparation

In-school training

Preparation at the departments for practical less

Preparation to instruct "TM"

Setting goals for each competency

Communicate to parents/guardians



## **Persons concerned and their roles:**

Person-in-charge	Main roles
Principal	<ul style="list-style-type: none"> <li>✓ Control all activities.</li> </ul>
Head of departments	<ul style="list-style-type: none"> <li>✓ Lead the activities to prepare for practical lessons</li> </ul>
Practical Teachers in each department	<ul style="list-style-type: none"> <li>✓ Prepare for practical lessons with regard to SB and 3S</li> <li>✓ Work together with teachers for theoretical lessons to create an annual plan (PR)</li> <li>✓ Draft lesson plans for practical lessons (PR)</li> </ul>



## **Evidence to keep**

Assessment result by a Principal

54

# Preparation

In-school training

Preparation at the departments for practical less

Preparation to instruct "TM"

Setting goals for each competency

Communicate to parents/guardians



## **Persons concerned and their roles:**

Person-in-charge	Main roles
Principal	<ul style="list-style-type: none"> <li>✓ Discuss with the teachers and create a standard for the preparation time for the next class, and communicate the standard to the teachers</li> <li>✓ Discuss with the teachers and decide how to tell the start time of class, and communicate it to the teachers.</li> <li>✓ Communicate to the teachers the standard for time management behavior of the school and MOETE</li> </ul>

55

# Preparation

In-school training

Preparation at the departments for practical less

Preparation to instruct "TM"

Setting goals for each competency

Communicate to parents/guardians



## **Persons concerned and their roles:**

Person-in-charge	Main roles
Teacher in charge A	✓ Prepare and display of timetables
Teacher in charge B	✓ Install system to know time, formulate management plans, and create management tools
Social Specialist	✓ Prepare for and implement communication of the time management behavior standard to the students



## **Evidence to keep**

Assessment result by a Principal

56

# Preparation

In-school training

Preparation at the departments for practical less

Preparation to instruct "TM"

Setting goals for each competency

Communicate to parents/guardians



## **Persons concerned and their roles:**

Person-in-charge	Main roles
All teachers	✓ Approve the goals and target values at the school staff meeting
Head of departments	✓ Hold a joint meeting to formulate the goals and target values ✓ One representative presents the goals and target values at the school staff for approval



## **Evidence to keep**

Minutes of staff meeting

57

# Preparation

In-school training

Preparation at the departments for practical less

Preparation to instruct "TM"

Setting goals for each competency

Communicate to parents/guardians



## **Persons concerned and their roles:**

Person-in-charge	Main roles
Social Specialist	✓ Plan the explanation to parents/guardians and implement it



## **Evidence to keep**

School records

58

## B) Implementation



1. Students orientation

2. Implementation of improved practical lessons

59

## Implementation

Students orientation

Implementation of improved practical lessons



### Persons concerned and their roles:

Person-in-charge	Main roles
Teachers in each department	✓ Plan and hold the orientation



### Evidence to keep

✓ Lesson Record



60

# Implementation

Students orientation

Implementation of improved practical lessons



## **Persons concerned and their roles:**

Person-in-charge	Main roles
Teachers in each department	✓ Deliver improved practical lessons



## **Evidence to keep**

- ✓ Practical Lesson Plan
- ✓ Record (work clothes, execution of sort/set in order/shine after lessons, etc.)



61

## C) Review & Report



Measuring/recording



Assessment of practical lessons



Infor sharing



Reporting to Idara/Mudiriya/MOETE

62

## Review & Report

Measuring/Record



### **Persons concerned and their roles:**

Person-in-charge	Main roles
Head of department	✓ Compile competency records for each department
Practical teacher of each department	✓ Measure and record of each competency of their class



### **Evidence to keep**

✓ Record of competencies

63

## Review & Report

Assessment of practical lessons



### **Persons concerned and their roles:**

Person-in-charge	Main roles
Head of department	✓ Assess practical lesson of his/her department and provide guidance to the teachers for their improvement



### **Evidence to keep**

✓ Practical Lesson Assessment Form

64



## Review & Report

Information sharing



### **Persons concerned and their roles:**

Person-in-charge	Main roles
Principal	✓ Call of staff meeting
Teachers	✓ Participation in staff meetings and reporting



### **Evidence to keep**

✓ Minutes of Staff meeting (or agenda)

65

## Review & Report

Reporting to Idara/Mudiriyya and MOETE



### **Persons concerned and their roles:**

Person-in-charge	Main roles
Principal	✓ Approval of the report and report to Idara/Mudiriyya/MOETE ✓ Assign teacher(s) for writing a report
Person in charge of writing report	✓ Write a report



### **Evidence to keep**

✓ Report

66

# Action Plan

	Target	Person-in-charge	Implementation Date	Assessment Methods	Evidence
<b>In-school training to ensure understanding of all teachers</b>					

67

# Action Plan

	Target	Person-in-charge	Due Date	Assessment Methods	Evidence
<b>Preparation at the departments for practical lessons</b>	Production according to request. PR				
	Safe behavior. SB				
	35				

68

# Action Plan

	Target	Person-in-charge	Due Date	Assessment Methods	Evidence
<b>Preparation to instruct “TM: Time Management”</b>					

69

# Action Plan

	Competency	Goal	Target Value	Due date	Assessment Methods	Evidence	Person-in-charge
<b>Setting goals for each competency</b>	PR:						
	SB:						
	3S:						
	TM:						

70

# Action plan

	Target	Person-in-charge	Due Date	Assessment Methods	Evidence
<b>Communication to the parents/guardians</b>					

71

# Action Plan

	Target	Person-in-charge	Due Date	Assessment Methods	Evidence
<b>Student orientation regarding practical lessons</b>					

72

المواهب الذين لديهم الجدرات

ماذا تريد الصناعة؟

1

ما هي الجدارة

هي وجود مزيج من:

- المعرفة
- المهارات القائمة على المعرفة
- الاحساس بالهدف والدافع للتطبيق العملي
- باستخدام المعرفة والمهارات

2

## الهدف من دليل الإرشادات

1. مساعدة مديري المدارس والمعلمين في المدارس الثانوية الفنية، وخاصة المدارس الثانوية الصناعية، على فهم الجدارات التي يجب أن يكتسبها الطلاب في أيامهم الدراسية
2. يوضح طرق تحسين الدروس العملية لتحقيق هذا الهدف

### Guideline Video 1

## على الطلاب اكتساب أربع جدارات رئيسية

1. PR : الإنتاج وفقاً للمواصفات.
2. SB : السلوك الآمن.
3. 3S : التصنيف/ الترتيب/ التنظيف.
4. TM : إدارة الوقت

5



هل تعتقد أن الجدارات الأربع تكمل بعضها البعض؟

6



كيف تعتقد أن المدرسة يمكن أن تعزز  
الإحساس بالهدف لدى الطلاب؟

7

## كيف يمكن للطلاب اكتساب الجدارات؟

يقوم المعلمون بتمكين الطلاب من اكتساب الجدارات بشكل أساسي عن طريق توجيه الطلاب إلى الممارسة المتكررة وإعطاء التوجيهات المتكررة في الدروس العملية.

8



متى تتم الممارسة والتوجيهات المتكررة لتمكين الطلاب من  
اكتساب الجدارة؟



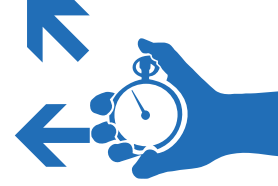
في بداية الحصه؟



خلال الحصه؟



في نهاية الحصه



**Guideline Video 6**

## الجدارة (١) PR: الإنتاج وفقاً للمواصفات

وصف الجدارة PR: الإنتاج وفقاً للمواصفات

يقوم بشكل مستقل بأداء مراحل العمل الأساسية (مراجعة المتطلبات – القيام بالعمل – التأكد من النتائج) من أجل تصنيع المنتج وفقاً للمواصفات

**Guideline Video 2**

تشكيل مجموعات صغيرة



الموضوعات المتقدمة

المعارف والمهارات الأساسية



المستوى الأكاديمي الأساسي للطلاب



## كيف يحضر المعلمون توجيهات الإنتاج وفقاً للمواصفات



### 1. خطة الدروس العملية

يقوم المعلمون بمواءمة خطط الدروس العملية لتمكين الطلاب من القيام بمزيد من الممارسة المتكررة لمراحل العمل الرئيسية.

مثال لخطة الدروس العملية (٥ دقائق)



مثال ١  
استخدم المبرد لإنتاج قطعة العمل على  
اليسار من المادة الخام على اليمين.



كيفية تحسين هذا المثال؟

## كيف يحضر المعلمون توجيهات الإنتاج وفقاً للمواصفات



### 2. تحسين خطة الدروس:

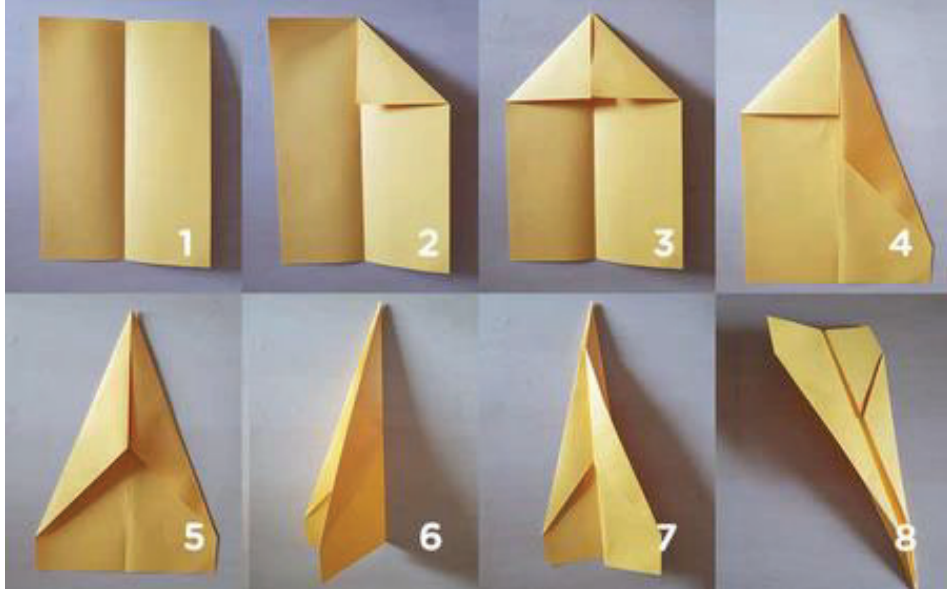
تقسيم العمل إلى عمليات صغيرة لزيادة ممارسة مراحل  
العمل الأساسية.

### مثال تقسيم العمل إلى عمليات صغيرة

استخدم يديك لإنتاج الطائرة الورقية على اليمين من المادة الخام على اليسار.



اتبع الخطوات الموضحة في الصورة أدناه لعمل طائرة ورقية



17

• علي كل مجموعه اختيار درس عملي والقيام  
بتقسيم الخطوات من اجل زيادة ممارسة  
مراحل العمل الأساسية.  
( ١٥ دقيقة )

18



مثال سيء (تسخين مفرط)



مثال سيء (لحم رائد)



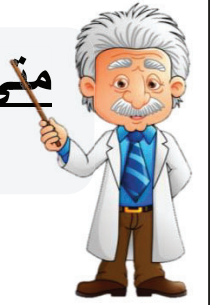
مثال على لحام جيد

## كيف يحضر المعلمون توجيهات الإنتاج وفقاً للمواصفات

3. تطوير نظام لتمكين الطلاب من مراجعة نتائج عملهم بسهولة وبصفة متكررة.



متى وكيف تتم الممارسة والتوجيهات المتكررة لتمكين الطلاب من اكتساب جدارة الإنتاج وفقاً للمواصفات؟



في بداية الحصه؟



خلال الحصه؟

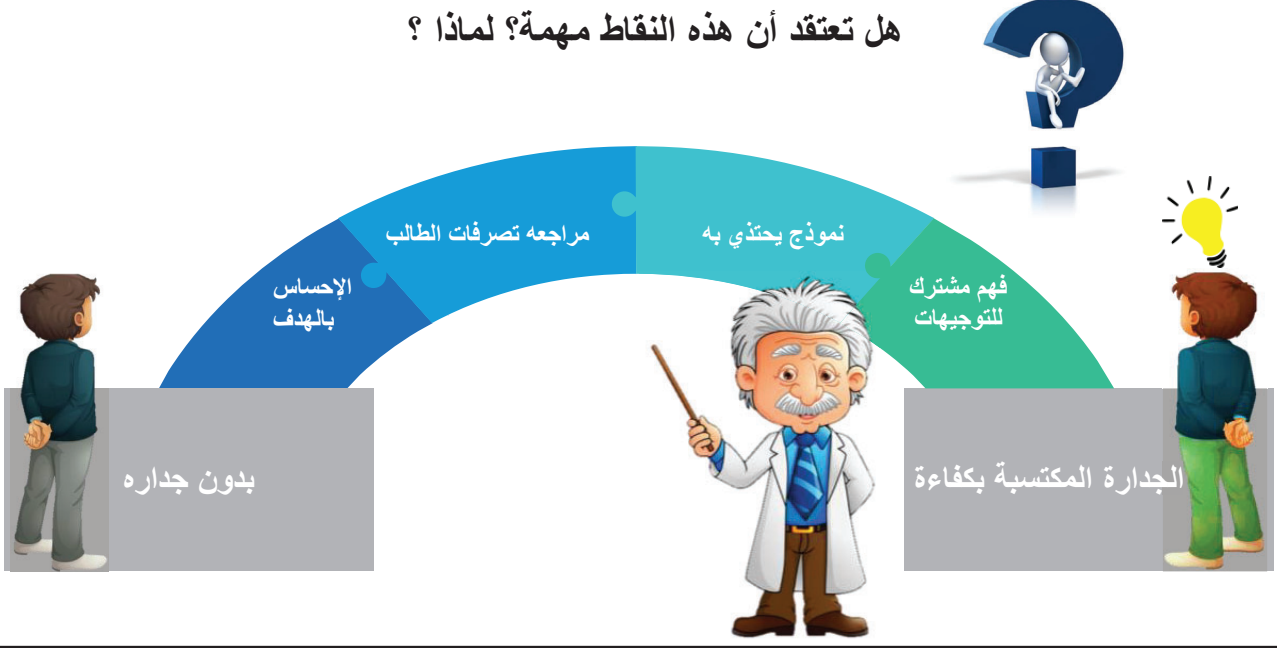


في نهاية الحصه



## نصائح مهمة للممارسة والتوجيهات المتكررة

هل تعتقد أن هذه النقاط مهمة؟ لماذا؟



21

## الجدار (٢) SB: السلوك الآمن

وصف الجدار SB: السلوك الآمن

يقوم بشكل مستقل بأداء السلوك الآمن لضمان السلامة في مواقع العمل بالمصنع.

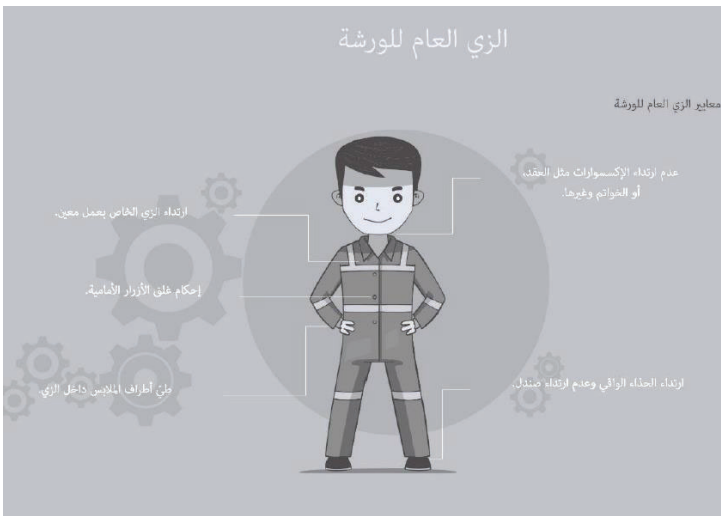
22

### Guideline Video 3

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## كيف يحضر المعلمون توجيهات السلوك الآمن

### 1. إعداد وعرض القواعد الأساسية لزي الورشة



24

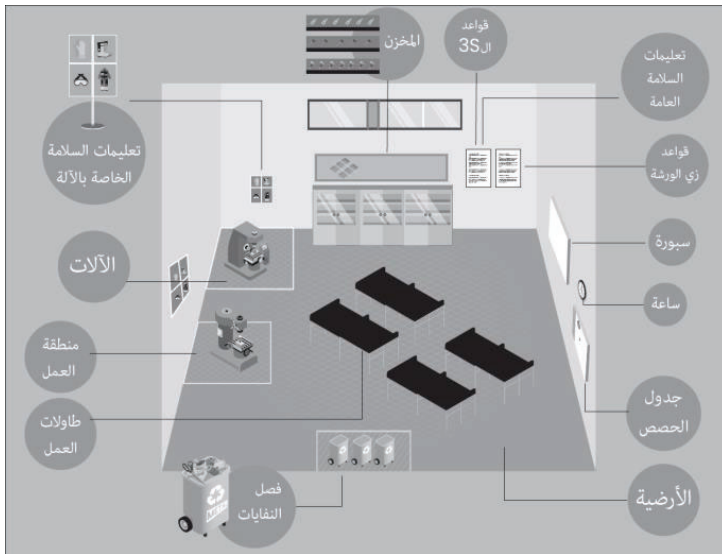


## كيف يحضر المعلمون توجيهات السلوك الآمن



2. إعداد وعرض المعايير العامة للسلوك الآمن

## كيف يحضر المعلمون توجيهات السلوك الآمن



3. إنشاء بيئة عمل قياسية

## متى وكيف تتم الممارسة والتوجيهات المتكررة لتمكين الطلاب من اكتساب جدارة السلوك الامن؟



في بداية الحصه؟



خلال الحصه؟



في نهاية الحصه



27

## نصائح مهمة للممارسة والتوجيهات المتكررة

هل تعتقد أن هذه النقاط مهمة؟ لماذا؟



28

## الجدارة (3) S3: التصنيف/ الترتيب/ التنظيف

وصف الجدارة 3S؟

يقوم بشكل مستقل بالتصنيف – الترتيب – التنظيف داخل الورشة لزيادة جودة المنتج والعمل بكفاءة.

29

**Guideline Video 4**

30



## كيف يحضر المعلمون توجيهات 3S

1. يمارس المعلمون أنفسهم التصنيف/  
الترتيب/ التنظيف في ورشة العمل  
(التصنيف/ الترتيب/ التنظيف)

31



## كيف يحضر المعلمون توجيهات 3S

2. إعداد وعرض قواعد التصنيف/  
الترتيب/ التنظيف (التميط)

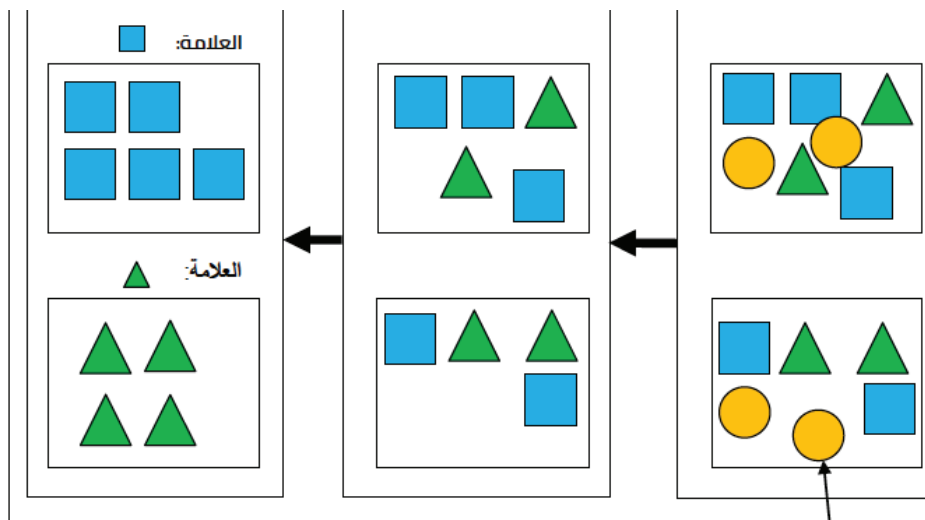
32



### كيف يحضر المعلمون توجيهات 3S

3. عقد تدريبات أولية للطلاب (التثبيت)

33



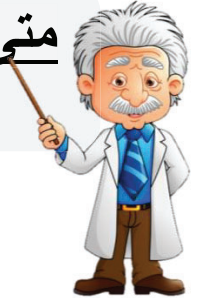
34



هل تعتقد أن 5S مرتبط  
بالسلوك الامن؟

35

متى وكيف تتم الممارسة والتوجيهات المتكررة لتمكين الطلاب  
من اكتساب جدارة ل 3S؟



في بداية الحصه؟



خلال الحصه؟



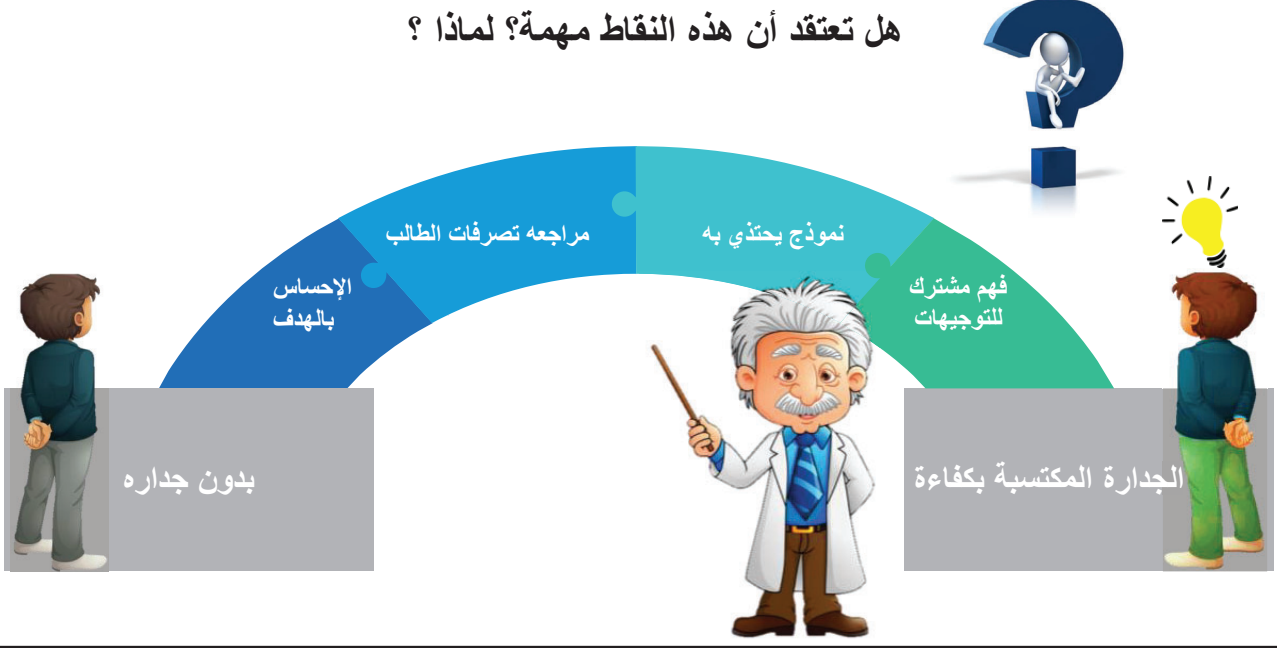
في نهاية الحصه



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## نصائح مهمة للممارسة والتوجيهات المتكررة

هل تعتقد أن هذه النقاط مهمة؟ لماذا؟



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## Practical lesson Model Flow

Guideline Video 6

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## الجدارة (٤) TM : إدارة الوقت

وصف الجدارة إدارة الوقت؟



- يقوم بشكل مستقل بإدارة الوقت بالشكل المتوقع في المصنع.

39

**Guideline Video 5**

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## كيف يحضر المعلمون توجيهات إدارة الوقت

1. وضع معايير وقت الاستعداد للحصة التالية وإبلاغها للطلاب



41



## كيف يستعد المعلمون لتعليم إدارة الوقت

2. تطوير نظام يتيح للمعلمين والطلاب معرفة وقت بداية الحصة التالية

42



## كيف يستعد المعلمون لتعليم إدارة الوقت

3. إبلاغ الطلاب ما هي العواقب المترتبة على عدم إتباع معايير سلوك إدارة الوقت (التأخير)

43



من المنوط بتطبيق إدارة الوقت

44

## متى وكيف تتم الممارسة والتوجيهات المتكررة لتمكين الطلاب من اكتساب جدارة إدارة الوقت؟



في بداية الحصه؟



خلال الحصه؟



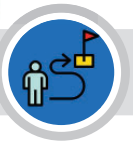
في نهاية الحصه



45

## نصائح مهمة للممارسة والتوجيهات المتكررة

هل تعتقد أن هذه النقاط مهمة؟ لماذا؟



الإحساس  
بالهدف



مراجعة تصرفات  
الطالب



نموذج يحتذي به



فهم مشترك  
للتوجيهات



مراجعة نمط حياتهم



الجدارة المكتسبة بكفاءة



بدون جداره

46

## الشراكة مع المصانع



47

## أهداف الشراكة مع المصانع



١- تمكين المعلمين من فهم احتياجات المصانع.

٢- تمكين المعلمين من فهم متطلبات التوظيف وظروف العمل في المصانع.



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كيف للمدرسة أن تجد  
شركات لإقامة شراكة  
معها

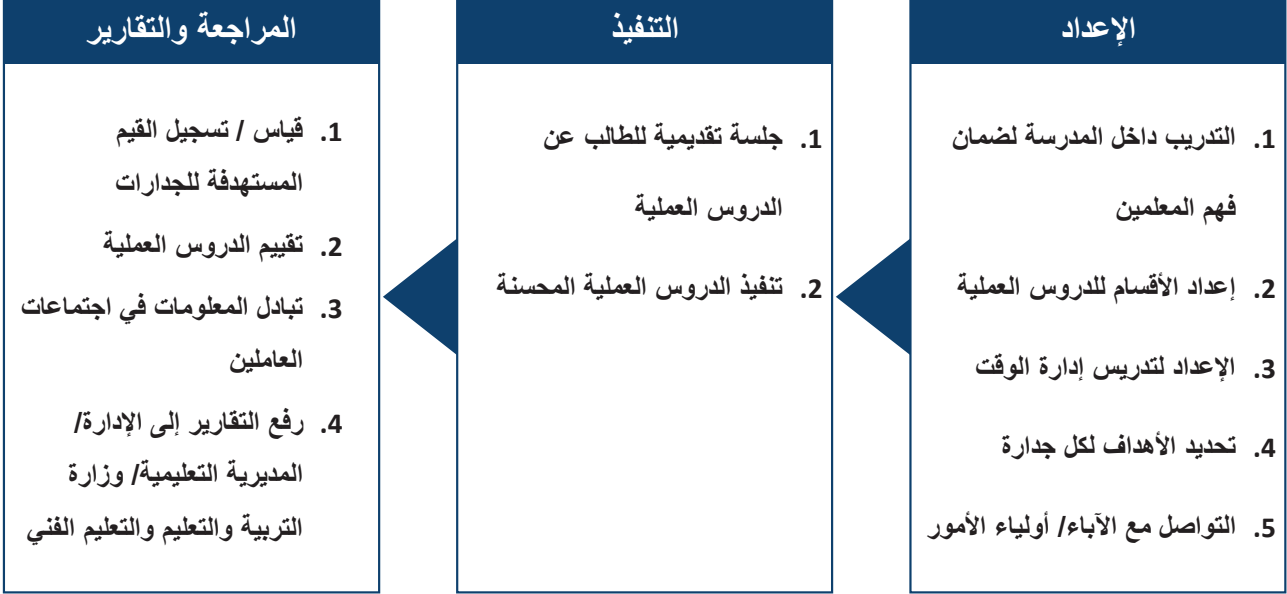
49



ما هي الأنشطة  
التي يمكن القيام  
بها بالشراكة مع  
الشركات؟

50

## عملية التنفيذ القياسية لهذا الدليل



51

## الإعداد

1. التدريب داخل المدرسة لضمان فهم المعلمين

2. إعداد الأقسام للدروس العملية

3. الإعداد لتدريس إدارة الوقت

4. تحديد الأهداف لكل جدارة

5. التواصل مع الآباء/ أولياء الأمور

52

# الإعداد

التدريب داخل المدرسة لضمان فهم المعلمين

إعداد الأقسام للدروس العملية

تحديد الأهداف لكل جدارة

الإعداد لتدريس إدارة الوقت

التواصل مع الآباء/ أولياء الأمور

الأشخاص المعينون وأدوارهم



الأدوار الرئيسية	المسؤول
✓ الشخص المسؤول عن تنفيذ التدريب داخل المدرسة ✓ تقييم الأنشطة	مدير المدرسة
✓ تنفيذ التدريب داخل المدرسة	المعلمون المشاركون في تدريب وزارة التربية والتعليم والتعليم الفني

سجلات يتم الاحتفاظ بها



✓ سجلات الجدارة.

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# الإعداد

التدريب داخل المدرسة لضمان فهم المعلمين

إعداد الأقسام للدروس العملية

تحديد الأهداف لكل جدارة

الإعداد لتدريس إدارة الوقت

التواصل مع الآباء/ أولياء الأمور

الأشخاص المعينون وأدوارهم



الأدوار الرئيسية	المسؤول
✓ إدارة جميع الأنشطة.	مدير المدرسة
✓ قيادة الأنشطة للتحضير للدروس العملية.	رؤساء الأقسام
✓ الاستعداد للدروس العملية فيما يتعلق بالسلوك الآمن والتصنيف، الترتيب، التنظيم. ✓ العمل مع معلمي الدروس النظرية لوضع خطة سنوية (الإنتاج وفقاً للمواصفات) ✓ وضع خطط الدروس العملية (الإنتاج وفقاً للمواصفات)	المعلمون في كل قسم

سجلات يتم الاحتفاظ بها ✓ تقييم النتائج بواسطة المدير



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# الإعداد

التواصل مع الآباء/ أولياء الأمور

تحديد الأهداف لكل جدارة

الإعداد لتدريس إدارة الوقت

إعداد الأقسام للدروس العملية

التدريب داخل المدرسة لضمان فهم المعلمين

الأشخاص المعنيون وأدوارهم (٢-١)



الأدوار الرئيسية	المسؤول
✓ يناقش مع المعلمين ويضع معيارًا لوقت الإعداد للحصة التالية، وإبلاغ المعيار إلى المعلمين.	مدير المدرسة
✓ يناقش مع المدرسين ويقرر كيفية تحديد وقت بدء الحصة، وتوصيله إلى المعلمين.	
✓ إبلاغ المعلمين معيار سلوك إدارة الوقت للمدرسة ووزارة التربية والتعليم والتعليم الفني.	
✓ تعيين والإشراف على المعلم الذي يقوم بالتحضير تعليمات إدارة الوقت.	

55

# الإعداد

التواصل مع الآباء/ أولياء الأمور

تحديد الأهداف لكل جدارة

الإعداد لتدريس إدارة الوقت

إعداد الأقسام للدروس العملية

التدريب داخل المدرسة لضمان فهم المعلمين

الأشخاص المعنيون وأدوارهم (٢-٢)



الأدوار الرئيسية	المسؤول
✓ إعداد وعرض جدول الحصص.	المعلم المسؤول (أ)
✓ تركيب نظام معرفة الوقت، وصياغة الخطط الإدارية، وتصميم الأدوات الإدارية.	المعلم المسؤول (ب)
✓ إعداد وتنفيذ معايير سلوك الخاصة بإدارة الوقت للطلاب.	الأخصائي الاجتماعي

سجلات يتم الاحتفاظ بها



✓ تقييم النتائج بواسطة المدير

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# الإعداد

التواصل مع الآباء/ أولياء الأمور

تحديد الأهداف لكل جدارة

الإعداد لتدريس إدارة الوقت

إعداد الأقسام للدرس العملية

التدريب داخل المدرسة لضمان فهم المعلمين

الأشخاص المعنيون وأدوارهم



الأدوار الرئيسية	المسؤول
✓ الموافقة على الأهداف والقيم المستهدفة في اجتماع العاملين بالمدرسة	جميع المعلمين
✓ عقد اجتماع مشترك لصياغة الأهداف والقيم المستهدفة	رؤساء الأقسام
✓ يعرض أحد الممثلين الأهداف والقيم المستهدفة في اجتماع هيئة التدريس للموافقة عليها	

سجلات يتم الاحتفاظ بها



✓ محضر اجتماع العاملين.

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# الإعداد

التواصل مع الآباء/ أولياء الأمور

تحديد الأهداف لكل جدارة

الإعداد لتدريس إدارة الوقت

إعداد الأقسام للدرس العملية

التدريب داخل المدرسة لضمان فهم المعلمين

الأشخاص المعنيون وأدوارهم



الأدوار الرئيسية	المسؤول
✓ وضع خطة الشرح للآباء/ أولياء الأمور وتنفيذها.	الأخصائي الاجتماعي

سجلات يتم الاحتفاظ بها



✓ سجلات المدرسة.

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# التنفيذ

1. جلسة تقديمية للطلاب عن الدروس العملية

2. تنفيذ الدروس العملية المحسنة



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# التنفيذ

تنفيذ الدروس العملية المحسنة

جلسة تقديمية للطلاب عن الدروس العملية

الأشخاص المعنيون وأدوارهم

الأدوار الرئيسية	المسؤول
✓ وضع خطة التوجيه وتنفيذها.	المعلمون في كل قسم



سجلات يتم الاحتفاظ بها

✓ سجلات الدروس.

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# التنفيذ

تنفيذ الدروس العملية المحسنة

جلسة تقديمية للطالب عن الدروس العملية

الأشخاص المعنيون وأدوارهم 

الأدوار الرئيسية	المسؤول
✓ تقديم الدروس العملية المحسنة	المعلمون في كل قسم

سجلات يتم الاحتفاظ بها 



- ✓ خطة الدروس العملية.
- ✓ سجلات الدروس العملية (سجلات ملابس العمل، وتنفيذ التصنيف/ الترتيب/ التنظيف، إلخ).

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قياس / تسجيل القيم المستهدفة للجدارات



تقييم الدروس العملية



تبادل المعلومات في اجتماعات العاملين



رفع التقارير إلى الإدارة/ المديرية التعليمية/  
وزارة التربية والتعليم والتعليم الفني

## المراجعة والتقارير

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# المراجعة والتقارير

قياس / تسجيل القيم المستهدفة للجدارات

الأشخاص المعنيون وأدوارهم 

الأدوار الرئيسية	المسؤول
✓ تجميع سجلات الجدارة لكل قسم	رئيس القسم
✓ قياس وتسجيل كل جدارة في الدرس	معلم الدروس العملية في كل قسم

سجلات يتم الاحتفاظ بها   
✓ سجلات الجدارة.

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# المراجعة والتقارير

تقييم الدروس العملية

الأشخاص المعنيون وأدوارهم 

الأدوار الرئيسية	المسؤول
✓ تقييم الدروس العملية في القسم التابع له وتقديم التوجيه للمعلمين لعمل التحسينات.	رئيس القسم

سجلات يتم الاحتفاظ بها   
✓ نموذج تقييم الدرس العملي.

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# المراجعة والتقارير

تبادل المعلومات في اجتماعات العاملين

الأشخاص المعنيون وأدوارهم 

الأدوار الرئيسية	المسؤول
✓ الدعوة لاجتماع العاملين	المدير
✓ المشاركة في اجتماع العاملين وإعداد التقارير	المعلمين

سجلات يتم الاحتفاظ بها 

✓ محضر اجتماع العاملين (أو جدول الأعمال).


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# المراجعة والتقارير

رفع التقارير إلى الإدارة/ المديرية التعليمية/ وزارة التربية والتعليم والتعليم الفني

الأشخاص المعنيون وأدوارهم 

الأدوار الرئيسية	المسؤول
✓ اعتماد التقارير وتقديمها إلى الإدارة/ المديرية التعليمية/ وزارة التعليم.	المدير
✓ كتابة التقارير	الأشخاص المسؤولين عن كتابة التقارير

سجلات يتم الاحتفاظ بها 

✓ التقارير.

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# خطة عمل

العناصر	المستهدف (الخطوات الإجرائية)	المسؤول عن التنفيذ	تاريخ التنفيذ	أساليب التقييم خلال فترة التنفيذ
<u>التدريب داخل المدرسة</u> <u>لضمان فهم المعلمين</u>				

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# خطة عمل

العناصر	المستهدف (الخطوات الإجرائية)	المسؤول عن التنفيذ	تاريخ الانتهاء من التنفيذ	أساليب التقييم خلال فترة التنفيذ
<u>إعداد الأقسام للدروس العملية</u>	الإنتاج وفقاً للمواصفات			
	(مثال) إعداد خطة للمجموعات الصغيرة	رئيس القسم- المدرسين (عملي)	21 سبتمبر 2019	مراجعة خطة الدروس العملية
	السلوك الآمن			
	(مثال) عرض ملصق (بوسنر) في مكان ظاهر في الورشة	المدرسين (عملي)	21 سبتمبر 2019	زيارة ورشة العمل
	التصنيف، والترتيب، والتنظيف			
	(مثال) عرض القواعد في مكان ظاهر في الورشة	المدرسين (عملي)	21 سبتمبر 2019	زيارة ورشة العمل

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## خطة عمل

العناصر	المستهدف (الخطوات الإجرائية)	المسؤول عن التنفيذ	تاريخ الانتهاء من التنفيذ	أساليب التقييم خلال فترة التنفيذ
<u>الإعداد لتدريس إدارة الوقت</u>	(مثال) وضع معيار لوقت الاستعداد للحصة التالية وإبلاغ الطلاب به. عرض الجدول في كل فصل (وكذلك ورش العمل)	المدير - (مدرسين)	21 سبتمبر 2019	زيارة الفصل و الورشة

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## خطة عمل

العناصر	الجدارة	المستهدف (الهدف)	القيمة المستهدفة (الهدف)	المسؤول عن التقييم	تاريخ التقييم للقيمة المستهدفة	أساليب التقييم
<u>تحديد الأهداف لكل جدارة</u>	الإنتاج وفقاً للمواصفات	(مثال) زيادة نسبة الطلاب الذين يحققون مستوى النجاح المنتج النهائي (التمرين) أثناء الدروس العملية	60%	المدير	ديسمبر - مارس	قياس نتائج التمرين
	السلوك الآمن					
	التصنيف، والترتيب، والتنظيف					
	إدارة الوقت					

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## خطة عمل

العناصر	المستهدف (الخطوات الإجرائية)	المسؤول عن التنفيذ	تاريخ الانتهاء من التنفيذ	أساليب التقييم خلال فترة التنفيذ
<u>التواصل مع الآباء/ أولياء الأمور</u>	(مثال) التواصل مع الآباء/ أولياء الأمور في بداية السنة الدراسية الجديدة (اجتماع التواصل، خطابات، الخ).	الأخصائي الاجتماعي	21 سبتمبر 2019	مراجعة سجلات المدرسة

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## خطة عمل

العناصر	المستهدف (الخطوات الإجرائية)	المسؤول عن التنفيذ	تاريخ الانتهاء من التنفيذ	أساليب التقييم خلال فترة التنفيذ
<u>جلسة تقديمية للطالب عن الدروس العملية</u>	(مثال) يتم شرح الجدارات الأربعة وأهميتها بالتفصيل.	المعلمون	1 أكتوبر 2019	مراجعة سجلات الفصل

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## **Appendix 9**

# **The Education in Upper Secondary School (Specialized Course: Industry) in Japan**

# **The Project for Enhancement of Technical Secondary Education**

The Education in Upper Secondary School  
(Specialized Course: Industry) in Japan

Final Report

October 2021

**The Project Team**

## **Preface**

This paper was prepared by the Project Team of “the Project for Enhancement of Technical Secondary Education” upon request from the Ministry of Education and Technical Education to provide how Japan ensure quality of upper secondary school (industry) education. The paper provides a comprehensive overview of the structure of Japanese upper secondary schools (industry). With reference to this, the team expect the ministry utilize it for its own policy making and institutional design.

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### **Abbreviations and Acronyms**

INSET	In-Service Training
MEXT	the Ministry of Education, Science, Sports and Culture
NCTD	National Center for Teachers' Development
NITS	National Institute for School Teachers and Staff Development
PRESET	Pre-Service Training
PTA	Parent-Teacher Association

# 1. Overview of Education in Japan

This chapter gives an overview of Japan's education system.

## 1.1 Principles Guide Japan's Educational System<sup>1</sup>

The Japanese Constitution sets forth the basic national educational policy, as follows: "All people shall have the right to receive an equal education corresponding to their ability, as provided by law. The people shall be obligated to have all boys and girls under their protection receive ordinary education as provided for by law. Such compulsory education shall be free."(Article 26)

The Basic Act on Education, which was promulgated and put into effect in March 1947, sets forth in more detail the aims and principles of education in accordance with the spirit of the Constitution. In it are established as specific national principles of education : equal opportunity, compulsory education, co-education, school education, social education, prohibition of partisan political education, prohibition of religious education for a specific religion in the national and local public schools and prohibition of improper control of education.

Nevertheless, the circumstances surrounding education have changed greatly in respects such as the progress of science and technology, advanced information technology, internationalization, the ageing society with falling birthrate, and family lifestyles. At the same time, the environment surrounding children has changed significantly, and a variety of issues have come to light.

In light of such circumstances, the existing Basic Act on Education was completely revised and the revised law established in December 15, 2006. The revisions to the law clearly set out principles for education considered to be extremely important today while at the same time inheriting the universal principles set out in the previous law. Such principles include placing value on public-spiritedness and other forms of the "normative consciousness" that the Japanese people possess, as well as respecting the traditions and culture that have fostered said consciousness.

In addition, the Basic Act on Education prescribed that the "Basic Plan for the Promotion of Education" be formulated to lay down the basic policies and measures to be taken to promote education. The first comprehensive plan by the Government about education was formulated on July 1st, 2008.

## 1.2 School System in Japan<sup>2</sup>

The modern school system of Japan began from the promulgation of the school system in 1872. Before World War II, Japan had a double-track school system, under which students, after finishing six years of compulsory education at 'Jinjo' elementary schools had to choose to proceed on to middle schools, advanced girl's schools, vocational schools, or higher elementary schools.

In the reforms of the educational system after World War II, Japan realized equal educational opportunities, gender equality, a school system with a single-track format, a 6-3 system of free compulsory education, etc. The Fundamental Law of Education and the School Education Law were enacted in 1947 and the 6-3-3-4-year system of school education was established aiming at realizing the principle of equal opportunity for education. Basically, a single-track school system was prepared for all children. As a result, opportunities to advance to higher education have been widely opened to all citizens.

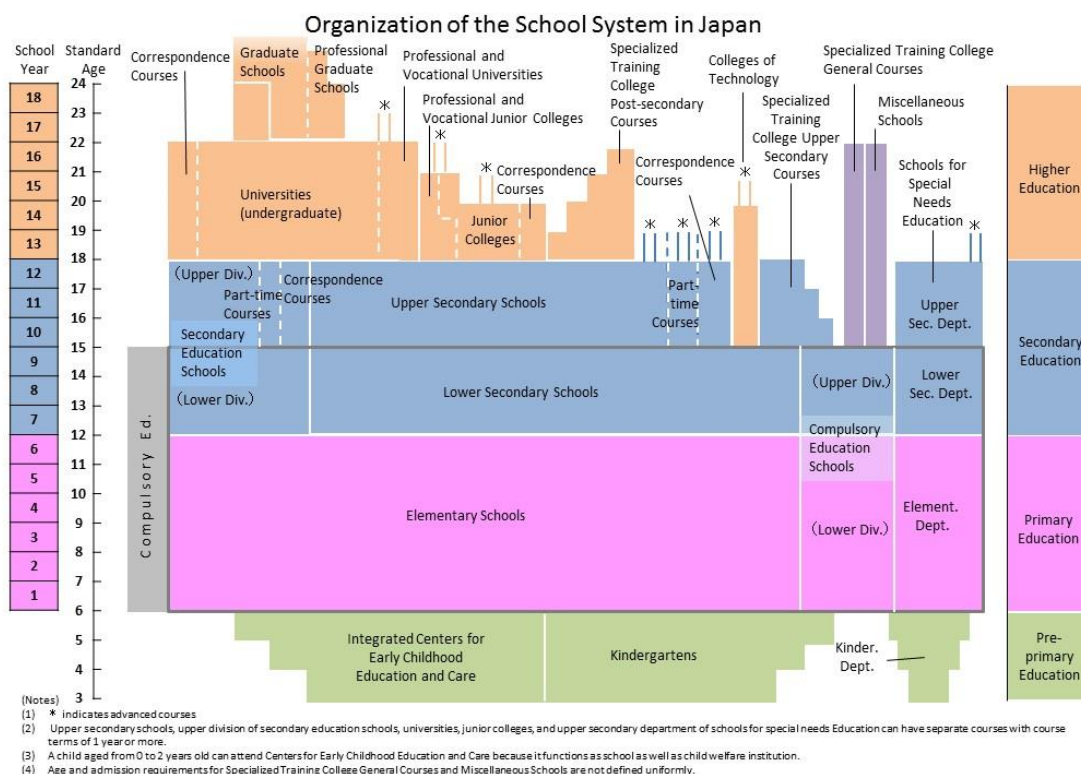
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<sup>1</sup> MEXT <https://www.mext.go.jp/en/policy/education/overview/index.htm>

<sup>2</sup> MEXT <https://www.mext.go.jp/en/policy/education/overview/index.htm>

Upper secondary schools were first established in 1948, offering full-time and part-time courses, and in 1961 correspondence courses were added to the system. The new system for universities began in 1949. The junior college system was established on a provisional basis in 1950 and on a permanent basis in 1964, following an amendment to the School Education Law. Colleges of technology were initiated as an educational institution in 1962 to provide lower secondary school graduates with a five-year consistent education (five-and-a-half years in the case of mercantile marine studies). Special schools were established separately by types of disabilities, such as Schools for the Blind, for the Deaf, etc at first, but to cope with children with multiple disabilities, the system was turned into “Schools for Special Needs Education” that can accept several types of disabilities in FY2007. In addition, there are kindergartens for pre-school children, and specialized training colleges and other miscellaneous vocational schools, which are offering technical courses or those for various practical purposes. Also, pursuant to the amendments to the School Education Law and other legislation in June 1998, the six-year secondary education school can be established to enable consistent education covering teachings at both lower and upper secondary schools from FY1999. Professional graduate school was established in 2003 (its predecessor was established in 2000), reflecting the demands of practical education for fostering highly specialized professionals. Integrated centers for early childhood education and care were newly established in April 2015. These have the functions of both schools and child welfare facilities. Compulsory education schools were newly established in April 2016. These have institutions comprising grades 1 through 9 that provide consistent basic education at the elementary and lower secondary levels. Pursuant to revisions in the School Education law in 2017, a system was instituted for the establishment of professional and vocational universities and professional and vocational junior colleges as new types of universities and colleges that will foster specialists and professionals through practical and high-quality vocational education and was established in April 2019.

Through this history, the current education system shown in the figure 1 below has been established.



**Figure 1: Organization of the School System in Japan**

Brief notes on each of the different types of educational institutions shown in the diagram are given below.

**(1) Kindergartens (Yochien)**

Kindergartens aim at helping pre-school children develop their mind and body by providing a sound educative environment for them. Kindergartens cater for children aged 3, 4 and 5, and provide them with one- to three-year courses.

**(2) Integrated Centers for Early Childhood Education and Care (Yohorenkeigata-ninteikodomoen)**

These facilities have the functions and characteristics of both kindergartens and nursery centers and also provide child-rearing support services for local communities.

**(3) Elementary Schools (Shogakko)**

All the children who have attained the age of 6 are required to attend elementary school for six years. Elementary schools aim at giving children between the ages of 6 and 12 primary general education suited to the stage of their mental and physical development.

**(4) Lower Secondary Schools (Chugakko)**

All the children who have completed elementary school are required to study in lower secondary school for three years until the end of the school year in which they reach the age of 15. Lower secondary schools give children between the ages of 12 and 15 general secondary education suited to the stage of their mental and physical development, based on the education given in elementary school.

**(5) Compulsory Education Schools (Gimukyoku-gakko)**

Compulsory Education Schools are institutions comprising grades 1 through 9 that provide consistent basic education at the elementary and lower secondary levels. Each school is staffed with a principal and faculty members who have teaching licenses for both elementary and lower secondary education.

**(6) Upper Secondary Schools (Koto-gakko)**

Those who have completed nine-year compulsory education in elementary and lower secondary school may go on to upper secondary school. Students must normally take entrance examinations to enter upper secondary school.

In addition to full-day courses, there are also part-time and correspondence courses. Full-day courses last three years, while both part-time and correspondence courses last three years or more. The last two courses are mainly intended for young workers who wish to pursue their upper secondary studies in a flexible manner in accordance with their own needs. All these courses lead to a certificate of the upper secondary education.

Upper secondary schools are established by the national government, local governments, and school corporations. When a municipality wants to open an upper secondary school, it must obtain the approval of the prefectural board of education. When a school corporation wants to open a school, it must obtain the approval of the prefectural governor.

In terms of the content of teaching provided, the upper secondary school courses may also be classified into three categories: general, specialized, and integrated courses.



### General courses

General courses provide mainly general education suited to the needs of both those who wish to advance to higher education and those who are going to get a job but have chosen no specific vocational area.

### Specialized courses

Specialized courses are mainly intended to provide vocational or other specialized education for those students who have chosen a particular vocational area as their future career. These courses may be further classified into agriculture, industry, commerce, fishery, home economics, nursing, science-mathematics, physical education, music, art, English language and other courses.

### Integrated courses

Integrated courses were introduced in 1994. These courses offer a wide variety of subject areas and subjects from both the general and the specialized courses, in order to adequately satisfy students' diverse interests, abilities and aptitudes, future career plans, etc.

## **(7) Secondary Education Schools (Chuto-kyoiku-gakko)**

In April 1999, a new type of six-year secondary education school, called "Secondary Education School" was introduced into our school system. Secondary education schools combine lower and upper secondary school education in order to provide lower secondary education and upper secondary general and specialized education through 6 years. The lower division in the first three years provides lower secondary school education and the upper division in the latter three years gives upper secondary school education.

## **(8) Schools for Special Needs Education etc. (Tokubetsu-Shien-gakko)**

Special Needs Educations are schools for children with comparatively severe disabilities and aim at giving education suited to their individual educational needs. Those schools comprise four levels of departments, namely, kindergarten, elementary, lower secondary and upper secondary departments. (The elementary and lower secondary are compulsory education.) After school system was turned into the current system that permits schools to accept several types of disabilities in 2007, this new implementation is gradually spreading.

Special Needs Education is provided also in regular schools. Special classes are small classes for children with comparatively mild disabilities that may be established in regular elementary and lower secondary schools. It may also be established as a branch class in a hospital for sick children.

There is another program of resource room (in regular elementary and secondary schools) where children with disabilities who are enrolled in and studying most of the time in regular classes may visit resource rooms few times a week to receive special instruction.

## **(9) Institutions of Higher Education**

Institutions of higher education in Japan include universities, junior colleges and colleges of technology. In addition, specialized training colleges offering postsecondary courses (see 8 below) may be regarded as one type of higher education institution.

### Universities (Daigaku)

Universities (Daigaku) are intended to conduct teaching and research in depth in specialized academic disciplines and provide students with advanced knowledge. Universities require for

admission the completion of upper secondary schooling or its equivalent and offer courses of at least four years leading to a bachelor's degree (Gakushi).

Universities may set up a graduate school offering advanced studies in a variety of fields leading to master's (Shushi) and doctor's (Hakushi) degrees. Graduate schools normally last five years, consisting of the first two-year courses leading to a master's degree and the following three-year courses leading to a doctor's degree. However, there is a possibility for those who are especially successful in their studies to get a master's degree in one year, and a doctor's degree in two years.

Professional graduate schools assume a leadership role in various areas of society, providing graduate courses (professional degrees) which specialize in fostering highly specialized professionals who will be active internationally. These schools have been established to train professionals in the fields of law (law schools), education (professional graduate schools for teacher education), accounting, business administration, management of technology (MOT) and public policy. Professional graduate school's course of study extends for two years (less than two years according to the school's regulation) or three years for law schools, and after its completion, students can proceed to doctoral course.

#### Junior Colleges (Tanki-daigaku)

Junior Colleges aim at conducting teaching and research in specialized subjects and at developing in students such abilities as are required for vocational or practical life. They require for admission the completion of upper secondary schooling or its equivalent, and offer two- or three-year programs in different fields of study, which lead to the title of associate degree. Most courses offered in these colleges are in such fields as teacher training, home economics, nursing science, humanities and social sciences<sup>3</sup>.

The great majority of the students in these colleges are women<sup>4</sup>. Those who have completed junior college may go on to university and their credits acquired at junior college may be counted as part of the credits leading to a bachelor's degree.

Junior colleges are also allowed to offer advanced courses which may lead to a bachelor's degree.

#### Professional and vocational universities (Senmonshoku-daigaku)

Professional and vocational universities/ junior colleges are one type of university/ junior college, respectively. They conduct teaching and research in occupational fields for which specialization is required and provide education to students so that they can achieve the abilities to develop practical and applicable skills necessary to become professionals. As with other universities / junior colleges, required for admission to a professional and vocational university / junior college is the completion of high school or its equivalent. They are based on a four-year system, the completion of which leads to the conferral of a bachelor's degree. The courses for the professional and vocational junior colleges are either two or three years, the completion of which entitles the conferral of an associate degree.

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<sup>3</sup> The total number of junior college students in 2019 is 109,122. The highest rate of students by field is 36.6% in teacher training. 2.6% of students are in the industrial field. ([https://www.mext.go.jp/a\\_menu/koutou/tandai/index.htm](https://www.mext.go.jp/a_menu/koutou/tandai/index.htm))

<sup>4</sup> The reason why the majority are women is that there are many departments related to occupations with many women, such as KG teachers, nursing teachers and medical nurses.

### Colleges of Technology (Koto-senmon-gakko)

Colleges of Technology (Koto-senmon-gakko, or the abbreviation of **KOSEN** also used), unlike universities or junior colleges, accept those who have completed lower secondary schooling, and offer five-year (five and a half years at colleges of maritime technology) consistent programs.

They were established in 1962, intended to conduct teaching in specialized subjects in depth and to develop in students such abilities as are required for vocational life. Students who have completed colleges of technology are granted the title of associate (Jun-gakushi) and may apply for admission to the upper division of university. Colleges of Technology are also allowed to offer a two-years advanced courses, which follow the five-year program in order to provide a higher level of technical education.

### **(10) Specialized Training Colleges (Senshu-gakko) and Miscellaneous Schools (Kakushu-gakko)**

In addition to the above-mentioned institutions of primary, secondary and higher education, there are educational institutions known as "specialized training colleges" and "miscellaneous schools", which offer a variety of practical vocational and technical education programs in response to diverse demands of people in a changing society. The great majority of these schools are privately controlled.

#### specialized training colleges

Courses provided in Specialized Training Colleges may be classified into three categories: upper secondary, postsecondary and general courses. Each course gives at least 40 students systematic instruction, lasting not less than one year, for 800 class hours or more per year.

Specialized training colleges offering upper secondary courses are called "upper secondary specialized training schools (Koto-senshu-gakko)" and those offering postsecondary courses are called "professional training colleges (Senmon-gakko) ."

The former requires for admission the completion of compulsory education, while the latter accept those who have graduated from the upper secondary schools or upper secondary courses of specialized training colleges and award the title, "technical associate (Senmonshi)," to those who complete post-secondary courses that fulfill certain criteria, including a study period of at least two years. Students who have completed an upper secondary course lasting three years or more of specialized training colleges designated by the Minister are entitled to apply for a university place.

#### Miscellaneous Schools

Miscellaneous Schools provide people with vocational and practical training such as dressmaking, cooking, book-keeping, typing, automobile driving and repairing, computer techniques, etc. Most courses in miscellaneous schools require for admission the completion of lower secondary schooling. These courses normally last one year or more with at least 680 class hours per year, but there are also shorter courses of three months or more. Miscellaneous schools are formal educational facilities stipulated by the School Education Law. The approval of the prefectural board of education is required for public schools, and the approval of the prefectural governor is required for private schools. There are no unlicensed schools.

### 1.3 Legal Basis of Education<sup>5</sup>

As in all constitutional democracies, in Japan the Constitution is the supreme law. All laws directly or indirectly affecting education must be in accord with the basic educational provisions of the Constitution. Statutes enacted by the National Diet, cabinet orders and ministerial ordinances constitute the legal basis for education.

The Basic Act on Education provides basic aims and principles, and other educational laws and regulations are made in accordance with the aims and principles of this law. Besides the Basic Act on Education, other major educational laws including the School Education Law dealing with the organization and management of the school system, the Social Education Law regulating the activities of social education, and the Law Concerning Organization and Functions of Local Educational Administration providing essential particulars on the system of local boards of education.

Cabinet orders are made to enforce the laws, and the Ministry of Education, Science, Sports and Culture (MEXT) publishes ministerial ordinances and notices concerning standards for establishing schools, curriculum standards such as the Courses of Study, and so on.

There is no specific law only for vocational education (specialized course). As mentioned in Section 1.3, Japan has adopted a single-track system, so each law incorporates content related to vocational education. There is no description about "vocational education" in the Basic Act on Education. However, one of the objectives of education of article 2<sup>6</sup> in the Basic Act on Education mentions "work". The article 58 of the School Education Law permits the establishment of specialized course which means vocational departments in upper secondary schools. The upper secondary school establishment standards give examples of vocational departments such as agriculture, industry, and commerce.

### 1.4 Structure of School Education

#### (1) The organizational structure of education administration and boards of education<sup>7</sup>

In Japan, most of schools at the elementary and secondary education levels are established by local education bodies. (Public schools account for following ratios [as of 2020]: elementary schools 98%, lower secondary schools 92%, upper secondary schools 73%, kindergartens 35%)<sup>8</sup>. Elementary schools, lower secondary schools and kindergartens are mainly established by the municipalities; and upper secondary schools, schools for the handicapped are mainly established by the prefectures. Among these local government authorities, the board of education is the executive body in charge of work related to the establishment, management, and abolition of schools.

Thus, the executive authorities for school education at the elementary and lower secondary school level in Japan are the boards of education in prefectures, and municipalities. And the national government and boards of education of prefectures and municipalities cooperate with each other and fulfill their own responsibilities and roles in educational administration.

<sup>5</sup> MEXT <https://www.mext.go.jp/en/policy/education/overview/index.htm>

<sup>6</sup> "developing individuals' abilities, cultivating creativity, and fostering a spirit of autonomy and independence by respecting the value of the individual, as well as emphasizing the relationship between one's career and one's everyday life and fostering the value of respect for hard work"

<sup>7</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

<sup>8</sup> <https://www.shigaku.go.jp/files/gakkousutou.r01.pdf>

MEXT, from the standpoint of achieving equal opportunity in education and both maintaining and improving the national level of education, fulfills following roles;

- Setting up the basic framework of the school education system and national standards (standards for the establishment of schools, standards for curricula, standards for the teacher certificate, legal standards for class sizes, and staffing levels of teacher and other personnel, etc.)
- Financial support measures for local governments (Financial support for the salaries of teachers and other personnel as well as for school construction, free textbooks for schoolchildren, etc.)
- Guidance and advice to prefectural and municipal governments on educational contents and school management

Each prefectural board of education has the following roles:

- appoints teachers and other personnel (including bearing their salaries) for elementary and lower secondary schools established by municipalities;
- appoints teachers and other personnel (including bearing their salaries) for upper lower secondary schools established by prefectures; and
- executes guidance and advice to municipalities on educational contents and school management, and thereby, supports the undertakings of local boards of education by setting up several branch offices and sending staff to them within their own district.

In making policy-decisions, MEXT holds meetings of learned people, such as members of the Central Council for Education and hears their opinions about important matters. MEXT assembles a wide range of learned people such as educational administration staff from local boards of education, principals, P.T.A. members, academics, and so on. When it receives a report from such a council, MEXT will use it for reference in policymaking.

## **(2) Philosophy, organization and operation of the boards of education system<sup>9</sup>**

Boards of Education are executive organization that are established in all prefectures and municipalities. In executing educational administration, boards of education guarantee neutrality from the influence of specific political and religious groups. And, to guarantee continuity and stability, boards of education are endowed with the character of organizations independent of governors and mayors, who are chosen in elections.

- Number of Boards of Education: prefectural 47, municipal about 1700
- Range of administration: matters concerning school education, social education, culture, sports, etc.
- Committee members: comprised of five part-time who in principle are laymen.
- Through consultations by these members, basic policies on local educational administration are decided. Receiving these, the superintendent of board of education, who is an expert in educational administration, as directs and supervises the secretariat (formed of the Divisions for School Education, Social Education, Teacher Training and so on.) and executes daily.
- The members are appointed from among persons of noble character who have knowledge about education, academia, and culture by the Governor or Mayor after securing the approval of local assembly. The term of appointment is 4 years.
- The members are appointed from a wide range of occupations such as expert professionals who are working as university professors or doctors, and also private

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<sup>9</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

company executives, as well as employees in the field of agriculture, forestry and fisheries. The members are mostly in their 50's and 60's.

### (3) Relations between Boards of Education and public schools<sup>10</sup>

Boards of education are responsible for managing established public schools properly. In concrete, the board supports the management of schools through budget distribution, personnel affairs and in-service training, curriculum guidance and teaching, maintenance of school facilities, and so on. Supervisors who are knowledgeable about school education (mainly persons with teaching experience) are posted in the secretariat in boards of education. And they execute expert guidance and advice on curricula and teaching plans to principals and teachers at public schools.

However, boards of education do not manage directly all school affairs matters. Basic management matters are fixed by rules (Boards of education indicate standards for school management and stipulate the contents of matters requiring approval or notification.). And schools are managed under the discretion and responsibility of the school principals with regard to daily and concrete matters in accordance with rules made by the boards of education and legal standards fixed by the national government.

### (4) Relations among the principal, head teacher and teachers<sup>11</sup>

The School Education Law says that a school shall have a principal, vice principal and an adequate number of teachers. The principal has the ultimate responsibility and powers for managing the school. The principal administers all affairs related to school management and supervises all staff including the and teachers who work at the school.

The general way to become principal or vice principal is for teachers to pass the examination for promotion to an administrative position having experience working at several schools under regular personnel transfers. The concrete steps for selection and appointment to the principal and vice principal posts are determined by the decision of each prefectural board of education.

## 1.5 Trend

This section presents two important trends related to Japanese education in reading this report.

The two major trends surrounding school education in Japan are the declining birthrate and the rising rate of children advancing to universities or junior colleges.

- **Declining Birthrate:** The peak of enrollment in elementary school was about 11.92 million children in 1978. Thereafter, the enrollment continued to decline. By 2019, the enrollment dropped to 6.37 million children in elementary schools. For upper secondary school, the peak of enrollment was about 5.62 million in 1990 and the enrollment dropped to 3.17 million in 2019<sup>12</sup>. Due to the number of newly hired teachers has decreased because of the declining birthrate, percentage of older teachers has been increased.
- **Rising Rate of Children Advancing to Universities or Junior Colleges:** The percentage of children advancing to universities or junior colleges has been on a continuous rise and reached about 58.6% in 2020<sup>13</sup>.

<sup>10</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

<sup>11</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

<sup>12</sup> [https://www.mext.go.jp/b\\_menu/toukei/002/002b/1417059\\_00003.htm](https://www.mext.go.jp/b_menu/toukei/002/002b/1417059_00003.htm)

<sup>13</sup> [https://www.mext.go.jp/b\\_menu/toukei/002/002b/1417059\\_00003.htm](https://www.mext.go.jp/b_menu/toukei/002/002b/1417059_00003.htm)

## 2. Overview of Upper Secondary Schools (Specialized Course: Industry)

The previous chapter introduced the overview of entire Japanese school system. This chapter will focus on Upper Secondary Schools (Specialized Course: Industry), which is the closest to technical school (industry) in Egypt.

### 2.1 The Number of School and Students with Specialized Course: Industry

Candidates for graduates from lower secondary education include upper secondary schools (Koto-gakko), colleges of technology (Koto-senmon-gakko), specialized training colleges (Senshu-gakko). Of these, the percentage of students going on to upper secondary school is the highest at 99%.

Upper secondary schools have General courses, Specialized courses, and Integrated Courses, as explained in the chapter1. The equivalent of the Technical Education School in Egypt is Specialized courses. Specialized courses (Industry) in Japan correspond to technical education schools (industry) in Egypt. However, in Japan, there are schools where several courses are set up. The following table shows the number of students and schools for each course. Of the total of 4,887 upper secondary schools, 1,972 schools (40.4%) have Specialized courses. There are 526 schools with industrial courses, but only 259 schools with industry only.

**Table 1: Number of Students and Schools by Course (May 2020)**

Category		The No. of students	Rate (%)	No. of schools that has the course (total number)	No. of schools that offer single course
Specialized courses	Agriculture	75,260	2.4	303	123
	Industry	230,934	7.5	526	259
	Commerce	178,159	5.8	609	164
	Fishery	8,161	0.3	41	21
	Home Economics	36,651	1.2	273	5
	Nursing	13,570	0.4	97	6
	Information	2,679	0.1	26	-
	Welfare	8,030	0.3	97	1
Subtotal		553,444	18.0	1,972	579
General Course		2,254,161	73.1	3,733	2,602
Other Special courses		107,066	3.5	571	49
Integrated Course		168,191	5.5	381	279
Total		3,082,862	—	6,657	3,509

Source: MEXT ([https://www.mext.go.jp/a\\_menu/shotou/shinkou/genjyo/021201.htm](https://www.mext.go.jp/a_menu/shotou/shinkou/genjyo/021201.htm))

\* Statistics are for full-time and part-time schools only (correspondence school is not included).

\* The "No. of schools that has the course" column shows the total no. of schools with multiple courses in each course.

**Comparison with Egypt: Percentage of Industry school students in high school students**

The below table shows the number and rate of students by education type in Egypt. 22.7% of students are enrolled in industry schools. This is about three times that of Japan's 7.5%.

**Table 2: Number and Rate of Students by Education type in Egypt (2017/2018)**

Category		No. of Students	Rate of Students (%)
Technical Education	Agriculture	215,638	5.5
	Commercial	751,268	19.0
	<b>Industry</b>	<b>897,936</b>	<b>22.7</b>
	Sub Total	1,864,842	47.2
General Education		1,708,847	43.3
Al-Azhar Education		373,459	9.5
Total		3,947,148	100

Source: Created by the Project Team based on data from CAPMAS "Statistical Yearbook 2019 -Education"

## 2.2 Characteristics of Specialized Course (Industry) in Historical Transition

Efforts for industrial human resources education at the secondary education level in Japan began in 1881, about 15 years later than general secondary education.

With the high economic growth that began in the 1950s, the demand for science and engineering personnel increased significantly, and the Japanese government responded by increasing the capacity of upper secondary schools (specialized course: Industry). About 80% of the graduates of the course during the high economic growth period worked as skilled workers and supported the manufacturing industry. However, this role as a skilled worker was not much different from that of General Course graduates. This is because the graduates of the General Course at that time were also excellent, and because the in-house training after joining the company was substantial, they could acquire a high skill after employment<sup>14</sup>. This is because, unlike Western European countries, there is no system or practice in Japan that requires special education and training in advance to obtain a vocational qualification. This is, apart from in-house education and vocational training, the result of effort that Japan does not have a habit of providing education and training for a specific profession and has aimed to develop highly versatile competencies that can handle a wide range of related tasks<sup>15</sup>. However, only technical high school graduates occupied the top technicians of skilled workers. Graduate of Specialized Course (Industry) have a high employment rate and a low turnover rate.<sup>16</sup>

By the mid-1980s, more upper secondary school graduates were engaged in the production process than in clerical work. Many workers in the production process are graduates of specialized courses (industry), and it has become difficult for graduates of general course to apply.

Due to the declining birthrate, the number of upper secondary school graduates decreased after peaking in 1992. The number of those who find employment after graduating from upper secondary school has decreased significantly (about 584,000), and the number of those who go on to university has increased to about 592,000. Japan has been in a long recession since then. It became difficult for both university graduates and upper secondary school graduates to find

<sup>14</sup> <https://www.jikkyo.co.jp/download/detail/77/9992657076> (Tyuuichi KATO)

<sup>15</sup> Susumu SASAKI "History and Issues of Technical Education"

<sup>16</sup> The National Association of Principals of Technical Senior High Schools[2013] The turnover rate for the third year of joining the company in April 2013 was 39.2% for all upper secondary school graduates, 31% for university graduates, and 17.3% for upper secondary school (industry) graduates, the lowest for upper secondary school (industry) graduates. This tendency was the same for the turnover rate in the first and second years of joining the company.



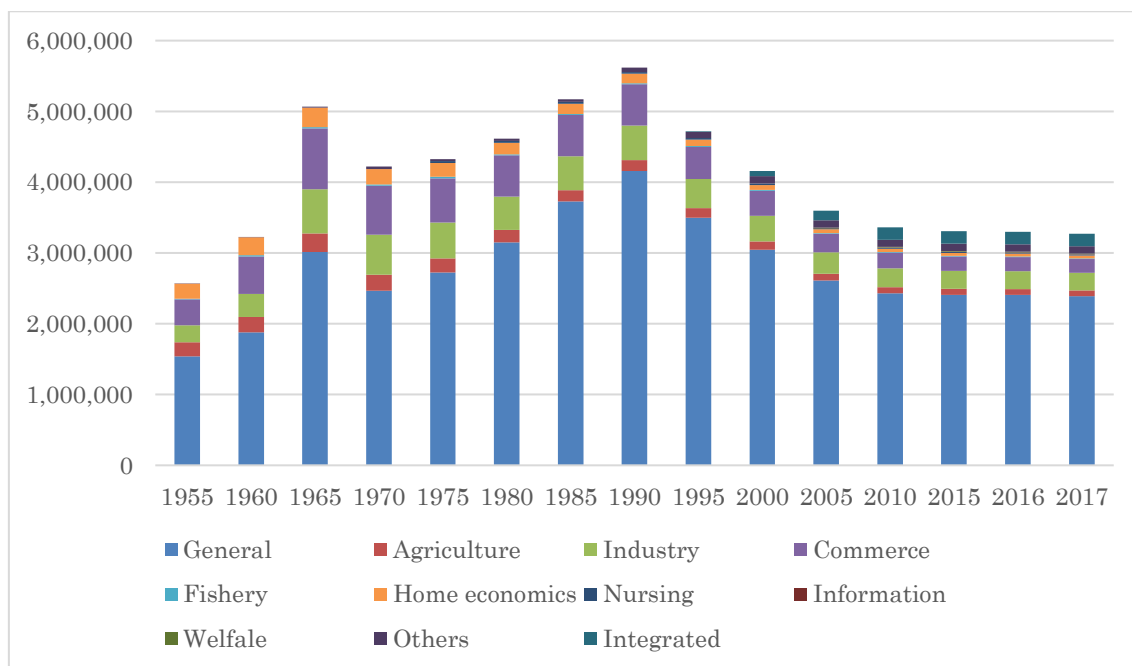
employment. However, graduates of upper secondary schools (specialized course: Industry) were hired due to regular employment of skilled worker and long relationships with companies.

Tendency of career plan after graduation of specialized course (industry) enrollees

Since vocational education and practical specialized education are provided at upper secondary schools (specialized course: industry), many students have wished to find employment after graduate, historically. Upper secondary schools (specialized course: industry) with a long history have close relationships with local companies and major companies, and graduates often find employment as skilled workers. In addition, small and medium-sized enterprises often recruit graduates of departments related to a specific industry. There is also an upper secondary school (specialized course: industry) where the job offer rate is 100%.

Trends in the number of students in specialized course (industry)

The following figure shows changes in the number of upper secondary school students. Since 1990, the number of students has been declining due to the declining birthrate. The number of students enrolled in upper secondary schools (specialized course: industry) has decreased from 624,105 in 1965 to 249,930 in 2017/2018.



Source: MEXT

**Figure 2: Changes in the Number of Students by Course in Upper Secondary School**

The decrease in the number of students in upper secondary schools (specialized course: industry) is partly due to the declining birthrate, but in the 20 years from 1970/71 to 1989/90, the total number of upper secondary school students increased by about 30% from 4,222,840 to 5,637,947, while the number of upper secondary schools (specialized course: industry) decreased by about 10% from 565,508 to 498,316. This may be due to the fact that the population decline has made it easier to enroll in the engineering department of the university, and as a result, more students are enrolled in the upper secondary school (general course). On the other hand, the percentage of students going on to university from upper secondary schools (specialized course: industry) is increasing.

Career after graduation in each course

The following table shows the career path after graduation in upper secondary schools. General course graduates have a high rate of admission to higher education institutions such as universities, and specialized course graduates tend to find employment. The employment rate of graduates of Upper secondary schools (specialized course: industry) is still high at 68.3% of graduates, but the rate of graduates going on to university etc. is also increasing at 14.1%.

**Table 3: Career After Graduation by Course (March 2020 graduates)**

Category	No. of students	Career After Graduation (%)				
		University, Junior Colleges, etc	Specialized Training Colleges / Public vocational school, etc	Employed	Others	
Specialized courses	Agriculture	25,367	14.0	29.2	53.6	3.2
	Industry	78,573	14.1	15.6	68.3	2.0
	Commerce	61,605	26.2	27.8	43.3	2.6
	Fishery	2,747	18.5	14.5	64.8	2.2
	Home Economics	12,246	26.0	32.8	37.5	3.7
	Nursing	4,390	87.8	9.1	1.9	1.2
	Information	858	36.5	33.3	24.0	6.2
	Welfare	2,580	17.1	31.0	48.8	3.1
Subtotal	188,366	20.8	22.7	54.1	2.5	
General Course	760,444	65.3	21.0	8.2	5.5	
Other Special courses	34,028	70.1	17.8	5.8	6.3	
Integrated Course	54,446	34.9	32.0	28.0	5.1	
Total	1,037,284	55.8	21.8	17.5	5.0	

Source: MEXT ([https://www.mext.go.jp/a\\_menu/shotou/shinkou/genjyo/021203.htm](https://www.mext.go.jp/a_menu/shotou/shinkou/genjyo/021203.htm) )

In recent years, the number of graduates going on to university from upper secondary schools (specialized course: industry) has increased, and some engineering departments of university actively accept those from upper secondary schools (specialized course: industry). The reasons for this include the following characteristics of industrial course graduates<sup>17</sup>.

- Have independence and a strong desire for self-actualization, and act on their own;
- Decide on a long-term pursuit theme at an early stage, have a future career vision with a view to after graduation, and continue efforts to realize it;
- Form a team with students from the general course, voluntarily build relationships to teach each other what they are good at and improve their own learning effect and quality; and
- Students with medium academic performance also tend to show good performance in unannounced exams and employment exams. It is thought that this is because many of the contents of the lectures at the upper secondary schools (specialized course: industry) were confirmed by experiments and practical training, and there was intelligent technology engraved in the body.

<sup>17</sup> Toshio MIYAMOTO [2009] <https://researchmap.jp/read0032020/works/5636126>

### 3. Education in Specialized Course (Industry)

Japan's upper secondary schools (specialized course: industry) are characterized by emphasizing the basics and nurturing students with versatility. In addition to daily school life guidance, the course has emphasized the practical lesson incorporated into the specialized course. A major feature of practical lesson is the development of soft skills through group activities and individual research activities as well as hard skills. Such education is provided almost on school campus without relying on companies for both classroom lectures and practical lesson.

This chapter introduces the following school guidance and activities that develop characteristic of students described at the end of the previous chapter; 1) curriculum, 2) Education through School Management with Multilateral Role of Teachers, 3) Support for Career Paths after Graduation and 4) Practical Lessons where Students acquire Soft skills and Basic Hard Skills.

Regarding 1), 2) and 3), the general course provides almost the same. However, specialized course is more focused than general course on student guidance and career support activities. 4) Practical lesson that allows students to acquire basic knowledge, skill and an attitude as an engineer is a feature of upper secondary schools (specialized course: industry).

#### 3.1 Course of Study<sup>18</sup>

In Japan, there is a school education standard "Course of Study" set by MEXT so that the same level of education can be received anywhere in Japan. In the "Course of Study", goals and rough educational contents of each subject are set for each elementary school, lower secondary school, upper secondary school, etc.

Each upper secondary school prepares a curriculum according to the actual situation of the area and school, based on the "Course of Study" and the standard number of class hours per year. (The school has discretion.)

Industrial subjects also have general educational content that is common throughout the country. In upper secondary schools, it is possible to select activities based on the actual conditions of the area and school, so a unique school is being created.

The general policy of curriculum organization is as follows (partial summary / excerpt):

- Aim to foster students who are in harmony as human beings. Foster students' competencies for living, ingenuity, and independence according to their development. Aim to establish student learning habits in collaboration with their family.
- Moral education at school: Considering that students are in a developmental stage where they can pursue and realize themselves and act based on their awareness as a member of the nation and society, provide education on how to be a human being and how to live throughout the school's educational activities.
- Guidance on physical education and health at school: Considering the stage of student development, conduct throughout the school's educational activities and in individual activities such as health and physical education, home economics, and extracurricular activities. In addition, through such guidance, promote cooperation with their families and local communities and encourage the practice of activities related to physical education and health that are appropriate in daily life. By doing so, aim to cultivate the foundation for living a healthy, safe, and energetic life throughout their lives.
- Fostering a view of work: Provide experiential learning guidance related to employment and volunteering according to the actual conditions of the area and school, and let them

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<sup>18</sup> MEXT: [https://www.mext.go.jp/content/1407073\\_14\\_1\\_1\\_2.pdf](https://www.mext.go.jp/content/1407073_14_1_1_2.pdf)

experience the preciousness of work and the joy of creation. This will foster a desirable view of work and profession and a spirit of social service.

The goals of the Specialized courses industry are: Students will acquire basic knowledge and basic skills in each field of industry, understand the significance and role of industry in modern society, and take the issues of industrial technology independently and rationally while considering the environment and energy. Develop creative abilities and practical attitudes for industrial and social development by solving problems with ethical standards.

As explained above, course of study of upper secondary schools (specialized course: industry) in Japan aim to foster students to acquire "competencies for living" which emphasizes the harmony of "solid academic ability", "richness in mind" and "healthy body" and then foster students to acquire the basic knowledge and skills of each industry, and to develop desirable attitudes, creativeness, and practical attitudes.

The instruction provided at specialized course (industry) in Japan has the following characteristics. The instruction other than the industrial field are the same in the general course.

- Aiming for whole person education. In addition to Japanese language, math, science, social studies, and English, the courses include physical education, music, art, home economics, and long home rooms (class council).
- In addition to extracurricular activities and club activities, carry out activities that take into consideration "cooperation with the community," including employment and volunteer activities.
- Cleaning of public places, various work done by team, and compliance with school discipline.
- For industrial subject, aim to foster basic knowledge and skill. In addition, aim to foster creative abilities and practical attitudes for industrial and social development by solving problems with ethical standards.

The above education and guidance contents cannot be achieved by class lecture alone. Therefore, teachers provide various guidance to students in addition to guidance at class lecture.

### **3.2 Education through School Management with Multilateral Role of Teachers**

Educational goals for school management are set for each school, reflecting the intentions of the principal. The principal has the right to make decisions about the campus. For example, the principal approves the entrance, dropout, transfer, study abroad, and graduation of students. In addition, the approval process is clear, and the rules that serve as criteria for judgment are in place, making it easy for teachers and staff to understand the policy. In addition, the principal evaluates the personnel of teachers in the school. Personnel evaluations of teachers are also being conducted on a performance basis and linking to wages has been introduced recently. The board of education makes decisions regarding the advancement and retreat of teachers and staff, but the principal can offer his opinions to the board of education.

Each upper secondary school has a school management system. School affairs such as academic affairs, career guidance, student guidance, and general affairs are set up in every school. Teacher and staff are assigned roles and are clearly stated at each school. Participating in school management as well as classes makes it possible to provide more comprehensive guidance to students, including learning and improving the living environment. It is thought that the functioning of Japanese school management is due to the efforts of teachers and staff.

Examples of the division of activities between these school affairs are described below.

- **Academic affair division:** Planning and management related to academic.
  - Management and coordination of regular exams, timetable organization, class time, supplementary classes due to teachers' business trip and leave, change of timetable, etc.
  - Management and coordination of annual school events prepared through discussion at staff meeting and approved by the principal in April, at the beginning of academic year.
  - Preparation and distribution of syllabus
  - Coordination of School Based INSET
  - Planning and coordinating of practice teaching (student teaching) at school educational training (see 4.5 (3))
  - Information management
  - Coordination of Out-of-school training (upper secondary school-university cooperation, etc)
  - Management of books / audiovisual
- **Students Guidance Division:** Conduct matters related to students' lives in general.
  - Road safety education<sup>19</sup>
  - Provide general guidance on daily life (e.g., bullying problem, smoking problem, permission for part-time job notification<sup>20</sup>, late arrival, greetings, dress code issue)
  - Long home room (class meeting) management
  - Educational counseling (interviews with students who are maladapted to school, etc.)
  - Theft / Lost and Found Management
  - Support for student organization activities (club activities, student general meetings, school festivals, sports festivals)

However, life guidance for students is always provided not only by the Student Guidance Department but also in all classes. In addition, life guidance is more rigorously conducted in upper secondary schools (specialized course: industry), where employment is earlier than in the general course<sup>21</sup>.

The following viewpoints are examples of the reasons for this emphasis on lifestyle guidance; When working in the factory, accidents involving the machine caused by improper clothing, loss of trust in producing defective products due to rule violations, damage to stop the whole work due to delay in time, and building good relationships through greetings

These are directly linked to safety management, time management, and communication skills in the company, and students who can practice these on a daily basis are highly evaluated as human resources with soft skills after employment.

In this way, each teacher divides school affairs and has a role other than delivering lesson in class and provides comprehensive guidance to students.

<sup>19</sup> The following activities are examples. 1) show A traffic safety video for students at the end of the semester. 2) Hold a seminar with nearby police officers

<sup>20</sup> In Japan, some schools allow, and some schools completely prohibit it. There are differences according to the actual situation of each school. However, upper secondary school students are totally prohibited from working after 10 pm.

<sup>21</sup> From the results of interviews with upper secondary school (industry) teachers

### 3.3 Support for Career Paths after Graduation

Career guidance is one of the divisions of school affairs, and guidance on career paths after graduation of students is for both admission and employment. The Career Guidance Department provides guidance on career aptitude diagnosis of students, career selection for higher education or employment (company, public servant) according to their interests and aptitude, career development, explanation of advantages of employment, application guidance and mock interviews.

Job hunting support activities are more active in upper secondary schools (specialized course: industry), where there are more applicants for employment than in the general course, which has many students going on to higher education. Teachers can provide more appropriate career guidance to students by analyzing industrial information and understanding the needs of industry. In addition, various measures are taken so that students can get a more accurate image after work as follows.

- An internship (training in company) is held once a year for about 3 days. This gives students the opportunity to experience the industry before getting a job. Students will have a part of lively information gathering for future employment by experiencing the field. It is also an opportunity for companies to find good students. The process to select a company for internship is that students tell the teacher about the type of industry they are interested in and the teacher match for a company that suits their wishes.
- Graduate advisory session: By having graduates come to school and explain their job hunting experiences and their experiences after employment, students can know the path they will take in the future.
- By inviting an outside lecturer from a company to give a lecture, it will be an opportunity to know the image of human resources that the company is looking for.
- Invite a person from a company as a lecturer to explain the image of human resources required by the company
- Post job information (job vacancies)<sup>22</sup> that clearly shows the business content and treatment. This allows students to know the balance between their desired work and the treatment including salary.

発行 年度	発行 日	企業 名称	事業 内容	勤務 地	資本金 総額	従業員 数	性別 比率	年齢 比率	募集 人数	募集 職種	募集 条件	募集 時期
2006	7月10日	株式会社 富士通	IT機器の開発・販売	千葉県千葉市	1000万	100	100%	100%	10	情報処理系(開発)	大学卒業以上	7月10日
2006	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2007	7月11日	パナソニック株式会社 住宅事業	エアコン・空調機	千葉県千葉市	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2007	7月11日	パナソニック株式会社 住宅事業	エアコン・空調機	千葉県千葉市	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2008	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2009	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2010	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2011	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2012	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2013	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2014	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2015	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2016	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2017	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2018	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2019	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日
2020	7月11日	株式会社 日立	一般工業 電気機械	東京都中央区	1000万	100	100%	100%	10	製造系(開発)	大学卒業以上	7月11日

Sample of posting Job information

It is thought that such information and experience during school life leads to a high employment rate and reducing the gap between future expectations during school life and the actual situation after employment has achieved a low turnover after employment.

<sup>22</sup> This sample information includes 1) The order in which the school received the application from the company, 2) the date when the school received the application from the company, 3) the company name, 4) business field, 5) the place of work when employed, 6) the company capital, 7) Work shift (daytime only or shift system including night shift), 8) monthly salary, 9) number of employees, 10) type of job to be recruited, 11) whether graduates of the school are working or not

### 3.4 Practical Lessons where Students Acquire Soft skills and Basic Hard Skills

In upper secondary schools (specialized course: industry), not only technical subject but also general subject is emphasized. Of the 90 credits required for graduation, 25 credits or more (about 40%) are specialized subject, and about 60% are general subject. In other words, by studying basic subjects other than specialized subjects, students will acquire general education as a member of society.

Upper secondary schools (specialized course: industry) have vocational subjects that are not in the general course, and vocational subjects include classroom lesson and practical lesson. The next table shows an example of the number of classes in the electrical department of Himeji Technical High School. In this table, practical lesson is 10% for 1st and 2nd graders and increases to 32% for 3rd graders.

**Table 4: Examples of Classes in the Electrical Dep, Himeji Technical High School**

Classification		Grade 1		Grade 2		Grade 3	
		Subject	hrs.	Subject	hrs.	Subject	hrs.
General (Major)	Japanese	Japanese	2	Japanese	2	Japanese	2
	English	English	3	English	3	English	2
	Social Study	Modern Society	2	World history	2	Japanese history	2
	Mathematics	Mathematics	4	Mathematics	3	Mathematics	3
General (other than Major)	P.E	P.E	3	P.E	2	P.E	2
		Health	1		1		
	Others	Music or Art	2				
	Tokkatsu	Tokkatsu	1	Tokkatsu	1	Tokkatsu	1
Career Education		Home economics	2				
specialized	Theory	IT basics	2	Electricity (basic)	2	Electricity (basic)	3
		Electricity (basic)	4	Electrical equipment	3	Power technology	2
				Power technology	3	Drawing	2
				Electronic tech	2		
	Practical	IT basics	3	Practical lesson	3	Practical lesson	7
						Project work	3
Total hrs.			31		29		31
Total hrs. for specialized			9		13		17
Ratio of Specialized			29%		45%		55%
Total hrs. practical in specialized			3		3		10
Ratio of practical			10%		10%		32%

Source: Created by the Project team based on Himeji Technical High School

The practical lesson has the following characteristics.

- The curriculum has a connection between theory and practical lesson, and the teachers are also conscious of them, so the course is consistent.
- Students are taught basic skills and versatile skill<sup>23</sup>. G1 students acquire basic skills through repetitive practice of basic skills. G2 and G3 students acquire advanced skills. For example, in the electronics department, students learn the basic knowledge of several types of parts such as ICs, LEDs, transistors, and diodes and experience their operation through repetitive practice of developing basic circuit in G1. In G2/G3, students experience further advanced skill for designing electronic circuits. Since these parts are used in various electronic devices, knowledge and inspection methods are useful in various industries.
- Students will also acquire useful attitudes after employment along with skills. For example, at the beginning of the lesson, a roll call is made every time, and at the roll call, students are also inspected for compliance with dress code. At the end of the lesson, the

<sup>23</sup> In Japan, various trainings, including skill training, are held after joining the company after graduating upper secondary school (industry). Therefore, companies expect upper secondary school (industry) graduates to have basic and versatile skill and knowledge rather than specialized skill. This is the reason why upper secondary schools (industry) place importance on teaching basics and versatility. (JPT)

equipment and tools are cleaned and restore to where they were. At the workshop, there are notices indicating safety behavior standard and precautions. These are the same as when working in a factory, and are repeated until they become natural in the training.

- Practical lesson is conducted in small groups (6 to 10 students) by multiple teachers. This enables students engage in work for longer and teachers provide detailed guidance. In addition, it is possible to experience teamwork within the group.
- Most upper secondary schools (specialized course: industry) have expensive equipment and software such as 3D printers and machining centers and can provide practical lesson.
- In Grade 3, the project work is incorporated into the curriculum. In project work, students create a team, decide what to develop, and develop it with their team. In the process, students use all the knowledge and skills learned so far comprehensively to solve issue happened for development, and ask advice to team members or teachers, and improve interpersonal communication skills.

### **3.5 Qualification that Students of Specialized Course (Industry) Acquire**

#### **3.5.1 Outline of Japanese Qualification system**

Qualifications in Japan can be divided into three, national qualifications, public qualifications, and private qualifications. This section outlines these three qualifications.

##### **(1) National qualifications**

A national qualification is a qualification carried out by the national government or an institution entrusted by the national government based on the law. Qualified persons are certified by the national government as having a certain level of knowledge and skills. Occupational licenses, where acquisition of qualifications such as lawyers is an essential condition for business execution, name monopoly qualifications that only qualified persons such as registered management consultants are allowed to give their names, and when conducting a specific business there are installation obligation qualifications (such as home building) required by law. Although it is difficult to obtain, it is a qualification that is guaranteed a professional status by the country and has high social credibility.

##### **(2) Public qualifications**

Public qualifications are qualifications that are positioned between national qualifications and private qualifications, and are qualifications implemented by private organizations and public interest corporations and certified by government agencies and ministers such as the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Economy, Trade and Industry. Although it is sponsored by a private organization, there are many qualifications with high credibility and high profile, and the qualifications obtained are publicly accepted and are qualifications equivalent to the national examination. Therefore, it is guaranteed that the acquirer has a certain level of ability, and it is advantageous when looking for a job.

##### **(3) Private qualifications**

Private qualifications are qualifications that private organizations and companies voluntarily certify by establishing their own examination standards. Some companies have qualifications that are widely recognized as having knowledge and skills as well as national qualifications and official qualifications, and qualifications that are directly linked to profession. The higher the recognized creditworthiness and value level, the more difficult it is to obtain a qualification.



### 3.5.2 Mechanism to Encourage Student Acquire Qualification

Students do not qualify for the above qualifications even after graduating from upper secondary school (specialized course: industry). However, they can acquire a qualification while attending school. Qualification that students could acquire while in school is different in department. The following table shows examples of qualification that students in mechanical department can acquire while in a school.

**Table 5: Examples of Qualification that Mechanical students can obtain while enrolled**

Name of Certification	Implementation Agency
Gas welding technicians	Ministry of Health, Labour and Welfare
Arc welding technicians	Ministry of Health, Labour and Welfare
Boiler engineer	Ministry of Health, Labour and Welfare
Technical illustration Engineer	Ministry of Health, Labour and Welfare
Machining engineers (conventional lathe)	Ministry of Health, Labour and Welfare
Dangerous object handler	Ministry of Internal Affairs and Communications
Electrical worker	Ministry of Economy, Trade and Industry
Installation technician	Ministry of Internal Affairs and Communications
Auto mechanics	Ministry of Land, Infrastructure, Transport and Tourism
Basic technical drawing test	The National Association of Principals of Technical Senior High Schools
Engineering drawing test	The National Association of Principals of Technical Senior High Schools
CAD test	The National Association of Principals of Technical Senior High Schools
Information technology text	The National Association of Principals of Technical Senior High Schools
Computation skill text	The National Association of Principals of Technical Senior High Schools

Source: The Project Team

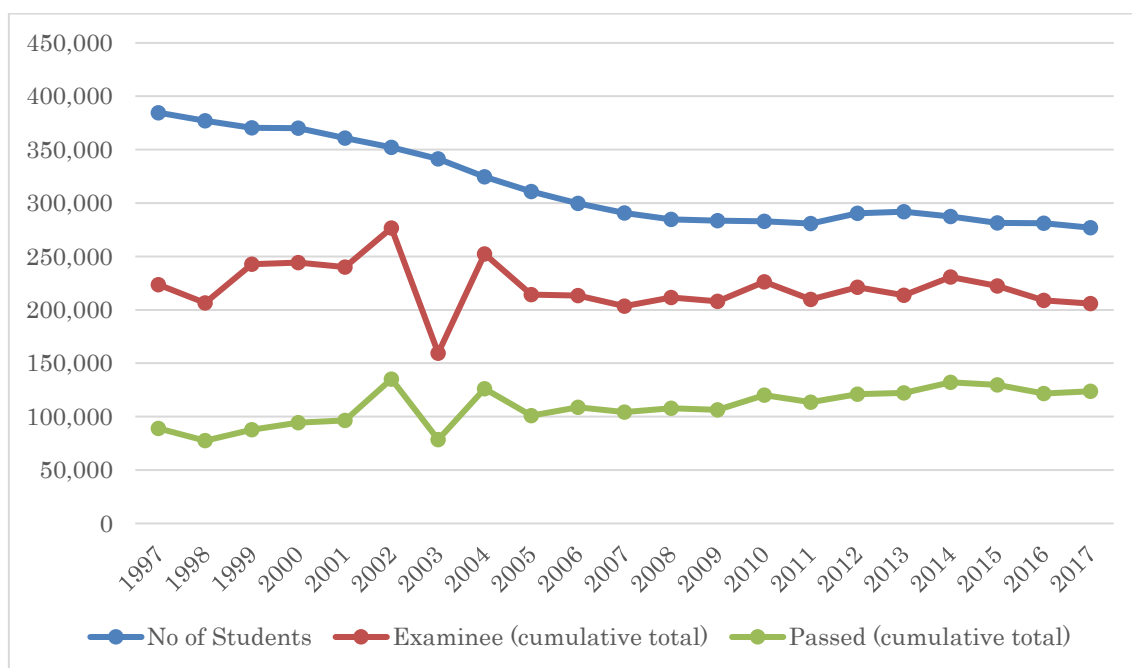
Upper secondary school (specialized course: industry) encourage students to obtain as many of these qualifications as possible while in school to help them find employment in the future. There are two major effort of recommending students: 1) efforts by each school and 2) other efforts.

- **Effort by each school:** Each school post various posters for qualification examination, provided from implementation agency, in their school. Teachers announce to students in their lesson too. The schools also encourage students to write their qualification on their resume so that students can understand acquiring qualification will benefit them for their placement.
- **Initiatives throughout the upper secondary school (specialized course: industry) group:** The junior meister award system established by “the National Association of Principals of Technical Senior High Schools” is the most major effort. The objective of this system is to encourage students acquire knowledge, technology and skills related to industrial through trying and passing qualifications, so that they could be active in the industry with confidence and pride after placement. This system was institutionalized from 2001. In this system, when a student passes a certain national qualification, the association give a predetermined score to the student. If the total score of the students is

over a certain point, the association award the student the title of Junior Meister. This is a system to appreciate students’ achievement officially as a result of students’ effort toward passing exam. It leads to revitalization and improving industrial secondary schools.

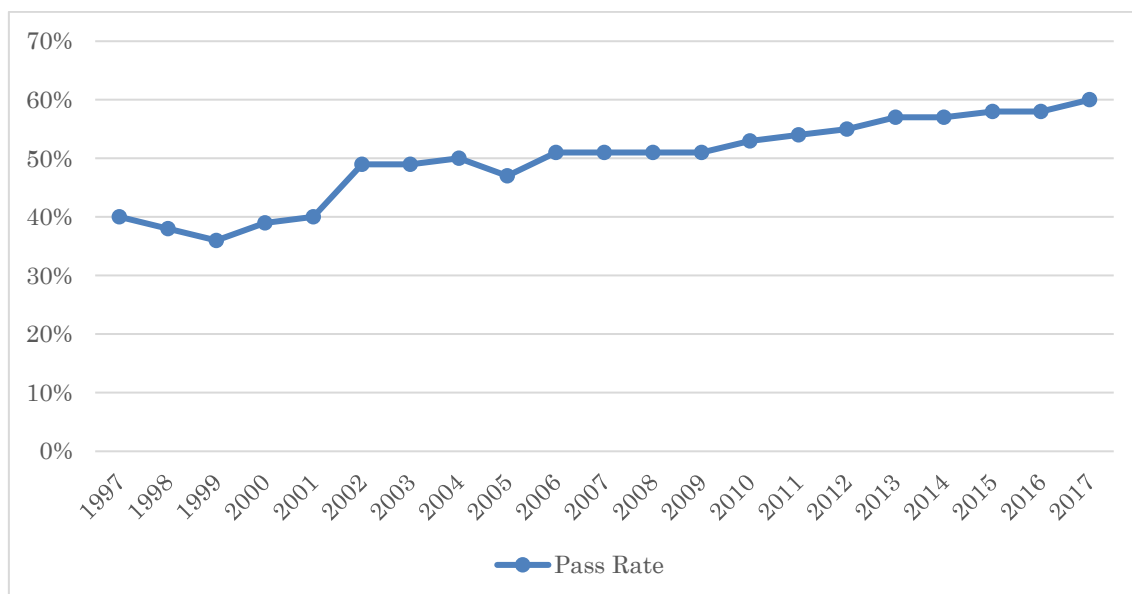
Transition of Acquiring National Qualification Exam by Industrial Secondary School Students

According to the statistics published by “the National Association of Principals of Technical Senior High Schools”, despite the fact that the number of students enrolled in industrial course continues to decline, the number of examinees remains flat. In addition, the passing rate is rising year by year. The pass rate has increased significantly in 2002 (the year following the introduction of the system in 2001). From this data, it is inferred that the system succeeded to motivate students toward acquiring a national qualification.



Source: [http://zenkoukyo.or.jp/web/content/uploads/h29sikaku\\_kekka.pdf](http://zenkoukyo.or.jp/web/content/uploads/h29sikaku_kekka.pdf)

**Figure 3: Transition of No. of Students, Examinee and Passed**



Source: [http://zenkoukyo.or.jp/web/content/uploads/h29sikaku\\_kekka.pdf](http://zenkoukyo.or.jp/web/content/uploads/h29sikaku_kekka.pdf)

**Figure 4: Transition of Pass Rate**

### 3.6 Connection of Specialized Course (Industry) with Local Industries

As mentioned in Section 3.3, the teachers of the specialized course (industry) work closely with local industries to find a place to accept internships. In addition, the teachers frequently visit companies to find companies candidates where students can find employment. Furthermore, by visiting the graduates' employment sites and listening to the graduates' evaluations, the teachers are making use of them in the education of the next students. Through these efforts, the specialized course (industry) is in close contact with the community.

Aside from teachers, there are organizations and human resources who support school activities in the local community to which the school belongs. For example, almost all schools have a parent-teacher association (PTA), which supports school activities. In addition, for the purpose of strengthening educational counseling, some schools appoint clinical psychiatrists as school counselors to respond to the mental anxieties of students and parents. This endeavor has been showing effect in preventing and resolving student's problem behavior and giving useful advice to parents and teachers about how to make contact with students.

## 4. Teachers

After World War II, education in Japan which improved the educational standards of the people and realized the concept of equal opportunity for all, has achieved certain educational level as a driving force for the development of the nation's economy and society. In this process, the Japanese teacher policy has promoted the set-up of conditions for ensuring well-qualified teachers and improving the quality of teachers through the following: guaranteeing the status of schoolteachers as public servants; the National Treasury's Share of Compulsory Education Expenditure System which has eliminated regional gaps in educational standards due to the different financial conditions of local governments and has realized the equal educational opportunities; improvement teachers' salaries under the Human Resources Recruitment Law; reform of the educational personnel certificate system; improvements in the in-service training system and so on.

Despite these efforts, teachers are still paramount to the quality of the school. It is necessary to improve the quality of teachers through teacher development, employment, and training. So, continuous development of teachers' skills is still very important. Therefore, beginning in March 2009, MEXT implemented a system for renewing educational personnel certificates that requires educators to acquire the most advanced knowledge and skills every 10 years.

Thus, the quality of teachers is still extremely important in Japan. This chapter details this teacher.

### 4.1 Personnel Concerned with School Education<sup>24</sup>

Article 7 of the School Education Law says that "a school shall have a principal and an adequate number of teachers", regardless of whether it is a national school or a local public school or a private school. The law states that the principal and teachers are indispensable to schools. At the same time, the law defines the types and jobs of teachers and other personnel, to be appointed at each school. In addition, it is possible for each school to appoint persons other than the following, when necessary:

- **The principal:** A school must have a principal. It is stipulated that the principal manages school affairs and supervises the school's staff. In other words, the principal manages all clerical affairs necessary for the management of the school and serves as a superior to all the staff who works at the school.
- **The vice principal:** A school must have a vice principal. However elementary schools or a lower secondary school with special circumstances, such as being small in scale, are not required to have a vice principal. The vice principal assists the principal with the handling of school affairs and, when necessary, teaches the children. In the event of an accident to the principal, the vice principal performs the principal's duties as acting principal. When the post of the principal is vacant, the vice principal performs the principal's duties.
- **Teachers:** A school must have teachers. Teachers shall oversee teaching schoolchildren. The posts filled by teachers include chief teacher (senior teacher) of some subject. They are supervised by the principal and oversee coordinating, guiding and advising in regard to the affairs under their care.
- **Assistant teachers:** Assistant teachers shall assist teachers in the performance of their duties. When there are special circumstances, assistant teachers can be appointed as alternatives to teachers.
- **Lecturers:** Lecturers shall engage in duties like those of teachers or assistant teachers. When there are special circumstances, lecturers can be appointed as alternatives to teachers.

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<sup>24</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

- **Clerical personnel:** Schools must have clerical staff provided. However, elementary schools, lower secondary schools and six-year secondary schools may dispense with clerical staff if there are special reasons as a smallness of scale. Clerical personnel are to engage in clerical affairs.
- **An assistant for practice:** An assistant for practice is a person whom upper secondary schools and six-year secondary schools can hire. The job of an assistant for practice is to help a teacher with experiments and practice.
- **Technical employees:** A technical employee is a person whom upper secondary schools, six-year secondary schools, schools for the blind and schools for the deaf can hire. The technical employee's job is to maintain machinery and apparatuses in good condition or take care of livestock mainly for vocational education courses.

## 4.2 Expectations for Teachers in Japan

The work of teachers who directly undertake school education concerns the development of children's minds and bodies, and greatly affects the building of children's characters, too. In view of the responsibility of teachers' work as specialists, the qualities and abilities required of teachers in every age are 1) a sense of duty as an educator; 2) deep understanding of human growth and development; 3) educational affection for school children; 4) expert knowledge of the subjects they teach; 5) wide-ranging, abundant culture; and 6) the practical teaching abilities to guide children based on such qualities and abilities.

In an era of rapid changes, teachers are also expected to provide education to cultivate children with the ability to learn and think on their own and with a well-rounded character. From this point of view, teacher's hereafter will be required to develop a broad vision in response to the age of internationalization and make use of that in educational activities. The teaching profession itself demands one to have a lofty character and considerable insight. For example, teachers are required to have qualities and abilities that members of society who live in this age of change must have, such as task-solving abilities, communication skills, and information literacy.

Thus, teachers are required to possess diverse abilities. But teachers' qualities and abilities develop throughout each stage of their career from pre-service at university to recruitment and in-service training. The Japanese government attaches importance to this fact in its policies concerning teachers.

## 4.3 Status of Teachers in Japan

### 4.3.1 Legal Position of Teachers in Terms of Status<sup>25</sup>

In Japan, teachers in national schools are national public servants, and teachers in local public schools are local public servants<sup>26</sup>. Therefore, regarding the treatment of these teachers, the National Government Officials Act is applicable to teachers in national schools and the Local Government Officials Act applies to teachers in local public schools. On the other hand, teachers in private schools are private citizens (employees under an employment contract based on private law.). Laws concerning other workers, including the Labor Standards Law, applies to them just like to employees of private companies. However, basically concerning the status and treatment of teachers in national schools and local public schools, several exceptions are provided under the

<sup>25</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

<sup>26</sup> Schools can be divided into national, local public, and private schools according to their owner. The number of upper secondary schools is 4874 in 2020, of which 15 (0.3%) are national, 3537 (72.6%) are local public and 1322 (27.1%) are private. ([https://www.mext.go.jp/b\\_menu/toukei/002/002b/1417059\\_00006.htm](https://www.mext.go.jp/b_menu/toukei/002/002b/1417059_00006.htm))

Law for Special Regulations Concerning Educational Personnel, which is a special law against the Government Officials Act and the Local Government Officials Act.

When it comes to handling of that status, the stipulations found in the National Public Employee Act and the Local Public Employee Act are applied. In these laws the cases in which limitations on authority (demotion, dismissal, suspension) and disciplinary punishment (dismissal, suspension, reduction in salary, admonition) can be carried out are described in a qualifying manner. The limitations on authority is applied only when the employee is unable to fully fulfill his or her duties. The disciplinary punishment is a sanction that is imposed for any breach of duty as a public employee or misconduct that is not suitable for a public employee. In cases other than those mentioned, it is not possible to carry out limitations or disciplinary punishment against the will of the person in question. This is done to protect the status of government employees, including teachers.

Likewise, given the special nature of the duties and responsibilities of teachers, who are serving the people at large through education, the Law for Special Regulations Concerning Educational Public Service Personnel, acting as a special law in relation to the National Public Employee Act and the Local Public Employee Act, list several special cases regarding the treatment of the status of teachers. For example, in contrast to training of public employees, which is a means to manifest and promote on-the-job efficiency, in the case of educational personnel, they “must ceaselessly endeavor to train and develop themselves to carry out their teaching duties”. As this shows, the INSET (In-Service Training) of teachers is considered an indispensable element in carrying out their work and has been established as a duty. The law further stipulates that, to do so, educational personnel must be provided with opportunities to undergo training.”

#### **4.3.2 Social Status of Teachers<sup>27</sup>**

In Japan, teachers’ social status is esteemed relatively high because of the following factors: 1) in Japan, a country with few natural resources, a certain level of importance and significance is recognized for the teaching profession that cultivate the human resources who will shoulder the next generation; 2) teachers’ job consists of teaching knowledge and skills necessary for every citizen to live as a member of society; 3) teachers in public schools have the status guaranteed as education officials (From the perspective of securing good human resources, teachers are paid a better salary compared to ordinary public officials).

Because of these reasons, the number of those aiming toward the teaching profession is almost constantly above the designated quota.

#### **4.3.3 Salaries<sup>28</sup>**

The salaries of teachers in national schools, like the salaries of general national public servants, are determined under the law concerning the salaries of regular government officials. Meanwhile, the salaries of teachers in local public schools, just like the salaries of other local public servants, are determined under the regulations of the local public body concerned. The classifications and amounts of their salaries are determined with the types and amounts of salaries of teachers in national schools taken as the standard.

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<sup>27</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

<sup>28</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

## 4.4 Teacher Certificate System

### 4.4.1 Types and Classifications of Teacher Certificates<sup>29</sup>

#### Type of certification

There are three types of teacher certificate: regular certificate, specialized certificate, and provisional certificate. The first two are necessary for a person to be a full-time regular teacher, and the last one is necessary to become an assistant teacher. The regular certificate is further broken down into advanced certificates, Class 1 certificates, and Class 2 certificates. A master's degree is required for the advanced certificate, a bachelor's degree for the Class 1 certificate, and an Associate degree for the Class 2 certificate.

#### Valid location

- The regular certificate is valid in all prefectures.
- The specialized certificate is designed to enable schools to invite into teaching positions working people who do not have a general teacher certificate but do have professional knowledge, experience, and skills from their careers. However, as a general rule, teacher training should take place in the university setting. With consideration given to having a balance between the specialized certificate and the general rule, the specialized certificate is valid only within the prefecture that conferred it.
- The provisional certificate is a teacher certificate that is conferred only when it is impossible to recruit someone who has a regular teacher certificate. This certificate is valid only within the prefecture that conferred it, and its period of validity is three years.

#### Validity period

The renewal system of teacher certification was introduced in 2009, to ensure suitable qualities as a teacher. Introducing this renewal system allowed an expanding possibility for advancing improvements in measures against the teachers who lack suitability as instructors, since the lifetime tenure system for all public servants has not functioned well. Validity period of regular certificate and specialized certificate are 10 years, and provisional certificate is 3 years.

The next table summarize the certifications.

**Table 6: Summary of Teaching Certificate**

Type of certificate		Required degree	Valid location	Validity period
Regular certificate	Advanced certificate	Master	All prefectures	10 years
	Class 1 certificate	Bachelor	All prefecture	10 years
	Class 2 certificate	Associate (junior college)	All prefecture	10 years
Specialized certificate		*1	Within the prefecture where the certificate was awarded	10 years
Provisional certificate		*2		3 years
No certificate				

Source: The Project Team

\*1: There is no required degree. This certificate is granted to those with superior experience and knowledge but without regular certificate. Passing educational staff exam required.

\*2 There is no required degree. This certificate is granted as an exceptional case only when no teachers with regular certificate can be hired. Passing educational staff exam required.

<sup>29</sup> MEXT [2015] "Improving the Quality and Ability of Teachers"

### Need for school-specific certificates and subject specific certificate

Certificates are conferred by types of schools, such as kindergartens, elementary schools, lower secondary schools, upper secondary schools, schools for the blind, schools for the deaf, and schools for the other disabled. Furthermore, the teacher certificates for lower secondary and upper secondary schools are categorized by subjects. Also, there is a teacher certificate for schools for nurse teachers, and this certificate is the same regardless of the special school type.

The subject areas for the upper secondary school teacher certificate include: Japanese Language, Geography and History, Civics, Mathematics, Science, Music, Fine Arts, Industrial Arts, Calligraphy, Health and Physical Education, Health, Nursing, Nursing Practice, Home Economics, Home Economics Practice, Information, Information Practice, Agriculture, Agricultural Practice, Industry, Industrial Practice<sup>30</sup>, Business, Business Practice, Fisheries, Fisheries Practice, Welfare, Welfare Practice, Merchant Marine, Merchant Marine Practice, Vocational Teaching, Foreign Languages, and Religion.

#### **4.4.2 Requirements for the Teacher Certificate<sup>31</sup>**

##### Regular Certificate

The teacher certificate is conferred on a person who meets the requirements for the certificate, as stipulated in the Education Personnel Certification Law. The prefectural board of education has authority to confer such certificates.

There are two cases when people receive a regular certificate. (1) When a person has a basic qualification such as a bachelor's degree and has also taken credits specified by the Education Personnel Certification Law at the university, or higher educational institution, designated by MEXT. (2) When a person passes the Educational Personnel Examination implemented by the prefectural board of education.

The basic qualification in case (1) refers to having a certain level of academic degree, specifically, a master's or bachelor's, which is required for the certificate for teaching at lower secondary schools or upper secondary schools. It also refers to having a bachelor's degree, as it is required for the certificate for teaching at a school for the blind, the deaf, or the otherwise disabled, or for the nurse teacher type of certificate. In addition, it refers to one having a certain type of required qualification, such as a teacher certificate for elementary school or a nurse certificate.

##### Specialized certificate

The requirements for the specialized certificate include (1) professional knowledge and experience or skills related to the subject concerned, and (2) credibility in society as well as the necessary motivation for and insight into teaching. In addition, recommendations about a candidate must be provided from the board of education that will appoint her/him, or the school, which will hire her/him. The recommendation must state something to the effect that the candidate is needed for the effective school education.

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<sup>30</sup> Of the teachers working in upper secondary schools, the rate of teachers who have an industrial and industrial practice license are 5.8% and 0.3%, respectively [2004, MEXT].  
([https://www.mext.go.jp/b\\_menu/toukei/001/002/2004/002/006.htm](https://www.mext.go.jp/b_menu/toukei/001/002/2004/002/006.htm))

<sup>31</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"



### Provisional certificate

A provisional certificate may be conferred to a person only when it is impossible to recruit someone who has a regular teacher certificate. In this case, the candidate must pass the Educational Personnel Examination to receive the provisional certificate.

### Additional Requirement

To receive a teacher certificate, the candidate must not only fulfill the requirements, of course, but also not fall under the reasons for disqualification. The reasons disqualifying a candidate are 1) being under 18 years old, 2) not finishing upper secondary school, 3) being under someone's guardianship even after turning 20, or being mentally impaired, 4) being penalized with imprisonment or a stricter punishment, 5) the person's teacher certification has been void for less than three full years, 6) the person's certificate was confiscated as a punitive measure less than three full years earlier, 7) after the date Japanese Constitution went into implementation, the person has either created or joined a party or group advocating the use of violence to destroy the Japanese Constitution or government.

## **4.4.3 Upgrade of Certificate<sup>32</sup>**

### System for Upgrading the Teacher Certificate

The current educational personnel system is based in principle on teacher training at an university. Completion of the teacher training course at an university is a basic requirement for a teacher certificate. At the same time, for those in-service teachers who already have a teacher certificate, there is an existing system so that the result of training will be reflected in their certifications. For example, when in-service teachers continue with training and pass the Educational Personnel Examination conducted by prefectural boards of education, those who have the Class 2 certificate will receive the Class 1 certificate and those with the Class 1 certificate will get the advanced certificate. This is meant to encourage their motivation for training and to improve their abilities and skills.

Specifically, for example, for teachers at elementary schools with Class 1 certificate to obtain the advanced certificate, three or more years of teaching experience with good marks and 15 or more credits at a graduate school are required. These required credits are usually taken at an university. However, teachers are allowed to take those credits through a different curriculum other than the teacher training course at an university. They may also obtain these credits by taking courses recognized, under the Education Personnel Certification Law, implemented by prefectural boards of education and/or designated city boards of education under the accreditation of MEXT.

### Obligations to Strive to Obtain the Upper-Level Certificates

Teachers with the Class 2 certificate are obligated to make efforts to obtain the Class 1 certificate, according to the Education Personnel Certification Law. This developed out of a report by the Personnel Training Council in 1987, that suggested that the Class 1 certificate, which has a Bachelor's degree as a basic qualification, be regarded as proof of the standard level of qualities and skills expected of a teacher. So, in 1988, this obligation was established with the goal of encouraging teachers holding the Class 2 certificate which has the equivalent of a junior college degree as its basic qualification, to acquire the Class 1 certificate.

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<sup>32</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

#### **4.5 Pre-Service Training (PRESET) (Teacher Training in Universities)<sup>33</sup>**

Very outstanding qualities are required in school education, since the activities of teachers, who are charged directly with the education of their students, involve the mental and spiritual development of human beings. Moreover, these activities are important duties having a major influence on the character development of young students. For this reason, teacher training in Japan, from the standpoint of the necessity to acquire high professionalism and aptitude as teachers and the need to judge those matters objectively, is in principle carried out at universities, which are higher education institutions. Also, by completing the curriculum at the university, it is possible to acquire the broad learning and culture, as well as specialized knowledge required for teachers. However, there are no limitations on the parties establishing universities (the national government, local governments, school corporations, etc.) or on the types of departments and courses, etc.

##### **(1) Proper Teacher Certification Philosophy**

Japan thoroughly adheres to its proper teacher certificate policy, which means that all teachers must have the relevant teacher certificate, in accordance with the Education Personnel Certification Law. To receive a teacher certificate, teachers need to fulfill certain requirements, which helps maintain teachers' qualities.

A proper teacher certificate refers to types of teacher certificate that correspond to the type of instructor (i.e. teacher, assistant teacher, and so on), type of school, and subject area. For example, if a person works as an elementary school teacher, he/she must have a teacher certificate for elementary school. If a teacher works as an assistant teacher of social studies at a lower secondary school, then he/she must have a teacher certificate for assistant teacher of social studies at lower secondary school.

To obtain a teacher certificate is an essential condition to become a teacher. Appointing or recruiting someone who does not have a teacher certificate is illegal and of course, invalid. Moreover, any person who carried out such an illegal appointment or hiring, and any person who became a teacher without a teacher certificate will be punished under the penal code.

##### **(2) Open System Principle**

Japan has adopted the basic policy of an open system that permits teacher training at general universities and departments other than teacher training colleges or departments. The basic principle of this open system developed out of reflections on the teacher training system before WWII in Japan, which was centered on teacher training institutes or normal schools. To seek people with broad perspectives and superior specialized knowledge for the educational field, a more liberal system was adopted for teacher training after the WWII. As a result, it is now possible to activate teachers' groups, while aiming for improvements in the qualities and abilities of each and every teacher.

Basically, teacher training at the university is carried out in accordance with the teacher certification course recognized through deliberations of the Central Council for Education, an advisory body to the Minister of Education, Culture, Sports, Science and Technology.

Under the principle of an open system, and in view of the need of developing the high qualities as is demanded of teachers as specialists, and planned training of educational personnel, national teacher training colleges and departments have been established in each prefecture.

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<sup>33</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

In this way, the basis for teacher training is formed through phases of education at the university as an institution of higher education. Preparing a systematic course of training and obtaining the accreditation of the Minister of Education, Culture, Sports, Science and Technology are considered to contribute to recruiting capable human resources as teachers.

### **(3) The Teacher Certification Course at universities**

To qualify for and obtain a teacher certificate at a university or college, a student must possess such basic qualifications as a bachelor's degree and have credits in the subjects stipulated in the Educational Personnel Certification Law. After obtaining these qualifications, a student receives a teacher certificate from the concerned prefectural board of education, which is empowered to confer teacher certificate.

The subjects for which a student must obtain credits to get a teacher certificate for kindergarten, elementary school, lower secondary school and upper secondary school are broadly divided into three categories: "subjects related to curricula", "subjects related to the teaching profession", and "subjects related to curricula or the teaching profession."

To the "subjects related to curricula," a student must study technically and comprehensively the substance of each subject mentioned in the National Curriculum Standards for kindergarten and the Course of Study for elementary schools and so on.

The "subjects related to the teaching profession" are six in number: (1) a subject related to the teaching profession's significance, etc., (2) a subject related to basic theories of education, (3) a subject related to curricula and teaching methods, (4) a subject related to student guidance, counseling and career guidance, (5) general exercises and (6) practice teaching (student teaching) at school. Details about the first five out of these subjects are described as follows:

- (1) "The subject related to the teaching profession's significance, etc." should contain "the significance of the teaching profession and teachers' roles", "contents of teachers' duties (including training, guaranteeing status as a teacher, etc.)" and "furnishing diverse opportunities that help students choose their future career goals".
- (2) "The subject related to basic theories of education" should contain "theories of education, the history of education and philosophy of education"; "the physical and mental development of infants, children and students and their learning processes (including the physical and mental development of handicapped infants, children and students and their learning processes)"; and "social, institutional and/or managerial matters related to education".
- (3) "The subject related to the curricula and the teaching methods" should contain "the significance of curricula and methods of organization", "methods of guidance for each subject" (in the case of kindergarten teachers, "methods of childcare guidance"), "methods of moral guidance", "methods of special activity guidance", and "methods and technical knowledge in education (including the use of information technology and educational aids)".
- (4) "The subject related to student guidance, counseling and career guidance" should contain "theories and methods of student guidance" (in the case of kindergarten teachers, "theories and methods of understanding very young children"), "theories and methods of educational counseling (including basic knowledge about counseling)", and "theories and methods of career guidance".
- (5) "The general exercises" must include analyses and research on more than one of the problems common to humankind or faced by Japanese society. They should also include methods and techniques for guiding infants, children or students about such problems.

As for the “subjects related to curricula or the teaching profession”, students are required to study “a subject related to curricula” or “a subject related to the teaching profession”.

The certificate for the upper secondary school teacher certificate (Industry, Industrial Practice ) can be obtained mainly at the following university faculties; Faculty of Education (Teacher training course, Faculty of Science and Engineering, Faculty of Engineering, Faculty of Architecture, Faculty of Fine Arts, Faculty of Life Design, etc

## **4.6 Appointment and Personnel Management of Public-School Teachers<sup>34</sup>**

### **4.6.1 Appointment**

#### **(1) Parties Who Appoint Teachers**

Teachers at public schools are selected and appointed from those holding teacher certificates and mainly by prefectural boards of education. The boards of education are in not only each prefecture but also in municipalities which are included in each prefecture. The power to appoint teachers, in principle, lies with the board of education that has established the school to which teachers belong. However, the power of appointment at elementary schools and lower secondary schools, which are involved in compulsory education, does not lie with the municipal boards of education that are the founders of the school, but with the prefectural boards of education. Because it has been stipulated in the law that the salaries of teachers at elementary schools and lower secondary schools are borne by prefectures to maintain the level of compulsory education, the powers of appointment also belong to prefectures. As for upper secondary schools, the schools for the blind, the deaf, and the otherwise disabled, these can be established either by prefectures or municipalities, but it is prefectures that establish them in most cases.

“Appointment” here means that each person appointing an instructor is employing new personnel as a public-school teacher after a selective procedure. Teachers employed by each person are to be allocated to schools according to the types of certificates they possess, and they will be transferred to other schools by some years. (Transfers will be described later.)

#### **(2) Selection Methods**

Appointment of teachers is done not by a competitive examination but through selective procedure, which is different from that for other public officials. There are following two reasons; 1) the educational personnel certificate system serves as actual proof that certain abilities required of a teacher have been obtained; 2) in view of the content of the teaching profession’s duties, which entail the instruction of children, a method of selection carrying out character evaluations more accurately is considered more appropriate.

Selection for teachers’ appointments for local public schools is normally carried out once a year in each prefecture. Most prefectures recruit applicants from around May to June, hold the first examination in July, and the second test around August or September. Precise schedules differ according to prefectures.

Students who would like to be employed as teachers after graduating need to take this selection examination before graduation. In Japan, it is common in early phase of senior year to take employment tests at companies etc. to be hired upon graduation. In recent years, the test schedules of companies have tended to become earlier in the hope of securing superior personnel. Many

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<sup>34</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

students regard employment at a company as one alternative even if they want to become a teacher. From this viewpoint, it would see that there are even cases of choosing the company employment.

The method of selection varies from one board of education to another. At present, almost all of prefectures conduct, as the first test, a written examination to investigate some set academic abilities that are required of a teacher. Persons passing that test undergo a second examination that involves practical skills and an interview.

Contents of the examination differ according to types of school and teaching subjects to be taught. The written examination mainly checks those aspiring to the teaching profession on their knowledge about the subjects they would take charge of in addition to knowledge about general subjects and education. For the second examination, interviews, skills tests, essays, and aptitude tests are carried out to judge the candidate's qualities as a teacher. The candidates for appointment by each board of education are determined through an overall judgment of the test results.

### **(3) Diversity on Selection Methods**

As a method to select teachers, it is appropriate to carry out various tests and not rely solely on the results of paper tests. The main contents of the examination ought to include interviews, practical classes, formulating instruction plans, on-site guidance and practical skill tests. In particular, the interviews, which make it possible to obtain detailed information on the applicants, has become more important, with many boards of education developing and implementing their own interviews. For example, the following methods have been introduced; (1) both individual interviews and group interviews, (2) interviewers from private enterprise, (3) group discussions only.

Practical classes, which are implemented in many prefectures and cities, function as a test in which a candidate teaches a class for several minutes using a blackboard and pretending to be facing a group of schoolchildren. Formulating instruction plans is a test in which applicants must create within a limited period a lesson plan that expresses their planned course of advancing a class. There are also cases where this is conducted along the practical lesson. In the on-site instruction, the examiners take the roles of students, acting out a situation in which they seek the advice of the applicant who plays the role of a teachers. This is mainly a method for evaluating the response of the applicants in such situations. These various methods are effective in judging the practical teaching abilities required of teachers.

Tests of practical skills other than the include those to judge the practical skills of applicants in subjects requiring practical instruction, such as music, physical education or English. These tests are conducted to observe the practical teaching abilities of applicants as teachers in various situations. Implementation of such tests has increased in recent years, and each board of education reassesses the methods every year.

#### **4.6.2 Probation**

As a rule, all public servants are hired conditionally. Later they are formally hired if they perform their jobs satisfactorily during the period of probation. As a rule, the period of probation for general public servants is six months. However, the period of probation is one year for the teachers in national schools and local public schools (not including principals and vice principals).

#### **4.6.3 The Teacher Evaluation**

At the school site, teachers are expected to make positive efforts to improve their academic instruction and student guidance and to participate in school management. Raising teachers' motivation and their skills is a matter of importance. To advance such undertakings, it is important

to reward teachers who have been striving very hard and have considerable achievements. In other words, there is a need to evaluate the abilities and performances of every teacher properly and to make suitable use of such evaluations in their allocation, treatment, and training.

However, in Japan, because of opposition to performance evaluations by employee organizations in the 1960s, few boards of education implemented such evaluations and thus could not properly utilize the results of evaluation in allocation, training, and especially in the treatment of teachers.

MEXT encourages boards of education to undertake initiatives in order to accurately assess the abilities and achievements of teachers and appropriately reflect such assessment in assignments, remuneration, and so on. In April 2008, it became mandatory for prefectural boards of education and others with the authority to hire teachers to provide extra training to any teachers whose teaching is found to be inadequate. MEXT therefore promotes fair and appropriate personnel measures to ensure that inadequate teachers do not engage in education.<sup>35</sup>

Since the 2000s, some boards of education have started introducing a system to implement teachers' performance evaluations and properly utilize the results in their allocation, training, and treatment. As of 2015, 46 prefectures out of 47 prefectures have introduced the system<sup>36</sup>.

#### 4.6.4 The Handling of Teachers with Insufficient Abilities<sup>37</sup>

The success or failure of school education greatly depends on the abilities of teachers who have direct responsibility for school education. Therefore, it is very important for schools to make sure that they have teachers with sufficient abilities. Although the number is low, there are some teachers who are not suitable to teaching. For example:

- Teachers who are self-centered, refuse to listen to others, and unable to carry out proper and necessary communication with students and their parents.
- Teachers who use harsh and violent language with elementary school children during classes and intimidate them.
- Teachers who use only printed handouts for their lessons and have students work on their own most of the time.

People with such problems in their qualities and abilities as teachers do exist

The existence of these teachers not only significantly influences the education of students but also greatly damages parents' and the community's trust in teachers and the entire school. Because of this, MEXT has been entrusting all prefectural and designated city boards of education with constructing a human resources management system for teachers of insufficient ability since 2001. This system is to identify teachers with problems, help them receive continuous guidance and provide training to restore their qualities and skills. This system is also supposed to mete out appropriate punishment, such as dishonorable discharge for teachers who are judged to be difficult to restore to a teaching job.

#### 4.6.5 Appropriate Personnel Allocation<sup>38</sup>

Personnel relocation is conducted in accordance with the needs and actual conditions of each prefectural and designated city board of education. Generally, each prefectural and designated city board of education sets out a basic policy for personnel relocation and regulates the period of working at one school (for example, as a rule, the typical period of working at one school is five

<sup>35</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

<sup>36</sup> [https://www.mext.go.jp/component/a\\_menu/education/detail/\\_icsFiles/afieldfile/2015/12/25/1365254\\_07.pdf](https://www.mext.go.jp/component/a_menu/education/detail/_icsFiles/afieldfile/2015/12/25/1365254_07.pdf)

<sup>37</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

<sup>38</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

to seven years), and the basic policies regarding the workplace (for example, a working term, one shall be sent to a remote rural area at least once); and relocations of teaching personnel take place in accordance with these rules. The major characteristic of teaching personnel relocation in Japan is that it allows for wide-ranging exchanges of personnel. That is, through such broad-based personnel exchanges, the gap in educational standards among areas is alleviated and a well-balanced teaching personnel allocation is realized. At the same time, teachers can improve their qualities and abilities by experiencing various school settings.

Teachers have the status as local public servant although their salaries are paid by the prefecture. Opinions of municipal boards of education ought to be reflected since they have authority to supervise teachers' performance. Having two executive bodies share official work for personnel management of teachers enables the proper allocation of personnel, improvement of educational standards, and facilitation of teaching personnel administration. For that reason, prefectural boards of education wait for the evaluation reports of teachers from municipal boards of education before appointing and/or discharging teachers. (Law Concerning Organization and Functions of Local Educational Administration article 38, section 1)

Furthermore, because principals always work with junior teachers and supervise them at school, they are very familiar with their working situation, competency, aptitude, eagerness, character, family circumstances and hopes concerning positions. Therefore, they are supposed to be capable of offering their opinions regarding appointments, dismissals, and other personnel affairs pertaining to the teachers who work at their school. (Law Concerning Organization and Functions of Local Educational Administration article 39)

## **4.7 In-service Training (INSET)**

### **4.7.1 Importance of INSET<sup>39</sup>**

The qualities and ability appropriate for the duty of teaching are formed increasingly through actual teaching experience. Teachers should take in-service training (INSET) to improve the minimal required knowledge that they gained when they took the teacher training courses in the university. One of the important factors is for teachers to develop their practical teaching skills to implement education that helps students of today's rapidly changing society to acquire "the zest for living," which refers to rich humanity and the ability to learn and think on their own.

Since the INSET is very important, the national and local governments must improve the INSET system to make sure that the teachers can take courses that meet their needs. Just providing development opportunities is not enough. Consideration they must be given as well to what kind of training should be provided for first-year teachers and teachers with ten years of experience, for example. It is also necessary to determine what kind of courses the principals should take and what kind of issues the currently in-service teachers should understand. Providing the needed course at the appropriate time is important. The development courses need to be improved and implemented systematically.

Due to the special characteristics of the teaching profession and the importance of INSET courses, the law states that "public servants in the field of education must continuously make efforts in research and training in order to perform their duties," and that "the authority who appoints a public servant in the field of education must establish methods and develop plans to improve facilities and various courses that are necessary for training of the public employee in the educational field. The authority must strive to implement such a development course."

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<sup>39</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

#### 4.7.2 System for Implementation of INSET

INSET is roughly classified into the three according to the organizer. 1) self-development by teacher(s), 2) School Based INSET (SBI) organized by the school, 3) INSET performed by a third party outside the school.

SBI is the tradition and culture of Japanese schools that has been conducted for long time. The aims of SBI are to cultivate awareness and commitment of individuals to their mission as teachers, to improve teaching abilities of teachers, to deal with children and student issues, to solve educational tasks at schools, to adjust teaching practices and management to correspond to new educational reforms, and to implement research as appointed by boards of education. Especially lesson study in which teachers consult each other after observing each other's class has a significant implication in sharing educational issues of school and solving problems. SBI is incorporated into school management plans. Training committees are established as an institutions for sharing of school duties and where individual responsibilities are made clear. When carrying out SBI, the roles and leadership of the head of such training / research is an important element. It is necessary to place an adequate number of capable people in such committee positions to ensure that the development of training programs actually happens. For SBI, it is a basic tradition that teachers should arrange such training independently. There is some concern that SBI arranged by teachers independently does not occur very frequently, although it is recognized that it is good to conduct SBI as an organization.<sup>40</sup> Another characteristic of SBI is that there is almost no cost.

INSET performed by a third party outside the school is divided into 1) INSET that participates as duties and 2) INSET that participates voluntarily. INSET that participate as duties is divided into a) INSET according to teaching experience and b) INSET according to their wishes. All applicable teachers are required to participate in INSET according to teaching experience. There is no obligation to participate in INSET that participate in their wishes. In both INSET, the training can be taken as part of the job, so the participation fee is free and the travel expenses for the training are paid by the board of education.

The national and local governments work together to share the duties for implementing the INSET that participates as duties. The national government is responsible for maintaining and improving the national educational standard. Specifically, it oversees training for middle-level teachers and principals, who are expected to play a leading role in their prefectures. The government is also responsible for courses related to the pressing issues that all teachers should understand. However, it is impossible to have all the corresponding teachers take the training courses. Therefore, the government has incorporated a system, which makes it possible for a limited number of people to take these courses and share what they learned with other teachers back in their schools or in their prefectures.<sup>41</sup>

The following table shows a type of INSET.

**Table 7: Type of INSET as duties**

Implemented by the national government (NITS)	Leader training	Central training courses for teachers, career guidance course, program to dispatch teachers overseas, etc.
	Pressing issues	Course to promote development of leaders for educational information technology; course to learn about AIDS and drug abuse, etc.

<sup>40</sup> [https://www.cried.tokushima.ac.jp/keiei/kyozai\\_ppe\\_f8.html](https://www.cried.tokushima.ac.jp/keiei/kyozai_ppe_f8.html)

<sup>41</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"



Implemented by the prefectures, designated municipalities, and core cities	Training in accordance with teachers' experiences	Training for first-year teachers, training for middle level teachers (these two courses are designated by law), training for five-year teachers, training for 15-year teachers, training for 20-year teachers, etc. (these are implemented at the discretion of each board of education)
	Training in accordance with different roles	Training for principals, training for vice-principals, training for head teachers
	Specialized training	Training for head teacher in subject instruction, moral education, student guidance, career guidance, information education, etc.
	Long-term dispatch training	Dispatch of teachers to universities, research institutions, and private companies
	Social experience training	Dispatch of teachers to private companies and social educational facilities
Others	Training conducted by the municipal boards of education, training courses by educational research organizations and groups, in-school development courses, studies conducted by individual teachers	

Source: MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

### (1) National Institute for School Teachers and Staff Development (NITS)<sup>42</sup>

In 2001, the National Center for Teachers' Development (NCTD), an independent administrative institution, was established to implement all development courses that should be conducted by the national government. In 2017, the NCTD was converted legally into the present-new incorporated administrative agency, National Institute for School Teachers and Staff Development (NITS). NITS is the national center for delivering INSET for schoolteachers, school staff and administrative personnel at Boards of Education. We aim to advance their trait and competency under national education policies.

Following the recommendation issued by the Central Education Council, the Administrative Law for the National Center for Teacher Development was appropriately amended to carry new responsibilities delivering a holistic professional development for schoolteachers and support personnel, thus generating a new organization, the National Institute for School Teachers and Staff Development (NITS). The predecessor organization, the National Center for Teacher Development (NCTD), was primarily responsible for providing professional development programs to the teachers sent from local BoEs. NITS continues the responsibility of delivering quality professional development programs, whilst at the same time, it makes further investments in perfecting the programs and their delivery. NITS is also expected to take concrete action as the core institution to bridge compartmentalized bodies of teacher preparation, teacher hiring and their professional development. Thus, NITS was launched through making a substantial structural reorganization to NCTD.

There are five main programs provided by NITS.

- I . Administration and Management Programs
- II . Programs for Professional Development Facilitators
- III . Professional Development Programs Entrusted by Local Public Bodies to NITS for advisement.

<sup>42</sup> <https://www.nits.go.jp/en/about/mission.html>

#### IV. Seminars and Symposiums

#### V. Advisory Services for Local In-Service Training Providers

##### I. Administration and Management Programs

NITS offers programs to develop administrative capacity for school leaders and other administrative staff. So that it is expected for them to be able to address institutionally diversified issues they face at school and to develop more local and student-oriented education. Programs are designed to meet the needs of teachers and staff in different career stages, such as: the programs for principals, assistant principals, mid-career teachers and administrative staff. The curriculum contents focuses on introducing the latest trends in educational policies and theories of school administration and management, which includes school compliance, mental health issues as well.

- Professional Development Program for School Principals
- Professional Development Program for Assistant Principals
- Professional Development Program for Mid-Career Teachers
- Administrative Development Program for School Personnel

##### II. Programs for Professional Development Facilitators

NITS offers programs for individuals who are responsible in developing, coordinating and delivering professional development programs for inservice teachers at their local boards of education. NITS also provides a training program for mentor teachers who are responsible for carrying out both effective and meaningful in-school training. Five umbrella themes are set for this program, and each theme has 19 specific courses.

- School Administration and Management
  - Program for School Administration Facilitators
  - Program for Curriculum Management Facilitators
- Counseling and Guidance
  - Program for Student Guidance Facilitators
  - Program for Student Counseling Facilitators
  - Prevention and Response to Misconduct and School Violence
- Schools in Globalizing Society
  - Program for Japanese Language Instruction for Non-Native Speakers.
  - Program for Foreign Language Instruction for Primary School Teaching
  - Induction Program for Assistant Language Teachers
  - Study Abroad Program for English Language Teachers
- Fitness and Health Program
  - Program for Fitness Improvement Facilitators
  - Program for Health Education Facilitators
  - Program for Dietary Education Facilitators
  - Program for School Safety
- Emergent Issues in School Education
  - Program for Communication Activity Facilitators
  - Program for Moral Education Program Facilitators
  - Program for Instructional ICT Facilitators
  - Program for Human Rights Education Program Facilitators
  - Program for Career Education Program Facilitators
  - Program for Early Childhood Education Program Facilitators

### III. Professional Development Programs Entrusted by Local Public Bodies to NITS for advisement.

NITS offers programs that are entrusted to them by Local Public Bodies. In the FY of 2017, NITS offers professional development programs for Science Education and two other programs under this category.

Industrial education and training for practical lesson assistants may be held

### IV. Seminars and Symposiums

NITS organizes seminars and symposiums to enhance and enrich communication across Teacher Education Centers operated under each local Board of Education and other stakeholders of teacher's professional development.

- National Symposium for Education Centers attached to Boards of Education
- Seminars for Professional Graduate School of Education
- Seminars for Senior Educational Administrative Officers
- Seminars for Envisioning the Education for the New Era
- Symposium for Prefectural Committee for Teachers Career Development and the Drafting of the Capability Index for Teaching Professions

### V. Advisory Services for Local In-Service Training Providers

Besides offering advice for local in-service training providers, NITS develops and provides resources for teachers to do self-training both in schools and at the convenience of their home.

- Provides online resources for Self-Development Activities
- Provides online community for teachers to exchange their ideas and tips.
- Sends training information and Commentary on Latest Educational Policies through mail-magazine.
- Provides assistance in development of In-Service Training Curriculum
- Trains professional development facilitators to design and deliver inservice training for the implementation of active learning practices.
- Provides information on specialists and lecturers
- Dispatches NITS Officers as Lecturers to Training Programs carried out by Local Public Bodies
- Provides Information Gathering and Accumulation on INSET organized by Local Public Bodies
- Surveys Teacher Training Institutions such as Education Centers attached to Boards of Education
- Offers Training Facilities and Equipment
- Provides Consulting Service on In-Service Teacher Training

#### **(2) INSET by Each prefectural board of education <sup>43</sup>**

Each prefectural board of education, which has power to appoint teachers, has the primary responsibility to conduct professional development courses. Various training courses are implemented by prefectural boards of education in accordance with the needs of each community and their issues. Such training courses include training for first-year teachers and training for tenth-year teachers; in accordance with their experience, training for principals in accordance with their roles; specialized training courses related to teaching subjects, and to student guidance; and training by dispatching teachers to graduate school to do research in special educational issues.

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<sup>43</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

In addition, there are training courses conducted by the municipal boards of education, or educational research organizations, in-school development courses designed and implemented mainly by study leaders at each school, and research groups voluntarily conducted by individual teachers off their normal working hours.

The below shows some of the INSET courses implemented by prefectural boards of education

#### INSET that the prefectural board of education is obliged to carry out

The following courses are conducted at the discretion of each prefectural board of education.

- **Induction training for beginning teachers:** The first year as a teacher is an important time to make connection with what is learned during the teacher training at the university and actual teaching at the school site. To help teachers increase their awareness as teachers and create the ground to develop independent educational activities, training for the first-year teachers was established. The training is given to all new teachers working for national and public schools. The course starts on the day when they are employed and continues for one year. When a school gets a first-year teacher, it must have a guidance teacher to help the new teacher. While engaging in school management and subject teaching, the first-year teacher receives practical INSET from the guidance teacher. The content of such training covers all matters necessary to fulfill the teacher's job. In addition, there are training opportunities outside of school that are implemented by education centers in each prefecture. Such opportunities include lectures about fundamental knowledge, observation of other schools, visits to and hands-on experience at social educational facilities, volunteer activities, and overnight trip programs.
- **Training for the middle level teachers:** All prefectures, which are the bodies authorized to appoint teachers, have been put under an obligation to implement training for middle level teachers for all teachers. Most teachers receive training after 10 years, but early ones receive it in the 8th year. With this course, teachers are evaluated for their performances in teaching subjects and student discipline. Through a training plan based on the evaluation, this course is carried out to correspond to ability and suitability of each teacher. This course is designed to help improve teachers' teaching abilities. Also, the result of this course is evaluated afterward and utilized for future guidance and training.

#### Other INSET

- **INSET for teachers with teaching experience:** The training according to teaching experience, together with the induction training for beginning teachers, is regarded as the basics of the teacher training system. Each prefectural board of education implements training for teachers who have five years, 15 years, and 20 years of teaching experience, in accordance with the current conditions and needs.
- **Social experience training:** Social experience training is designed to help teachers expand their perspectives as active members of society. In this course, teachers are sent to private companies, social educational facilities, and social welfare facilities.
- **Training in accordance with different roles (e.g. principal):** There are role-based training courses for principals and vice-principals to help them acquire appropriate abilities and skills.
- **Specialized training:** There is also specialized training relating to subject teaching and student guidance to ensure the expertise of teachers.

### **(3) Social Experience Training Program for Teachers**

It is very important for teachers to have various experiences outside of school in order to expand their outlook as active members of society. For this reason, MEXT promotes steady implementation of social experience training programs by providing financial aid to prefectural boards of education to pay for expenses.

There are two types of the social experience training programs; 1) a short-term program for less than one month; 2) long-term and ranging from one month to one year.

- **The short-term social experience training program:** It is conducted as part of the induction training for beginning teachers and lasts for one year beginning from their appointment date, or else as part of teacher training for experienced teachers implemented according to their teaching experience, such as fifth-year teacher training. In the induction training for beginning teachers, as part of training outside school, social experience training programs are implemented at private companies, social welfare facilities, and social educational facilities. These courses have been producing positive results. Through the social experience training program, teachers experience a working environment that is entirely different from that at school. Teachers can improve their interpersonal skills by dealing with a wide range of customers and further expand their outlook as active members of society. At the same time, they have opportunities to understand what society requires from school education. The results of these social experience training programs are reflected in school educational activities through improvements in their teaching skills and communication with students and their parents.
- **Long-term Social Experience Training:** By sending teachers to private companies and/or other facilities for a certain period ranging from one month to one year, the long-term social experience training is becoming popular nationwide and helps instructors attain solid results from their social experience.

Through these short-term or long-term social experience training programs, teachers who have only teaching experience after graduating from an university will expand their outlooks and improve their interpersonal skills. Consequently, it results in gaining the extensive qualities and abilities needed for teachers to deal with children's character formation.

#### (4) INSET for hard skill

The acquirement of teacher's certification for specialized course (industry) at university do not require the acquirement of relevant skill qualifications. Also, there is no skill test in the selection process for appointment. Therefore, those without sufficient skill level may be hired as industrial course teachers. In such cases, it is common for skilled teachers to develop their skills by School Based In-Service Training (SBI)<sup>44</sup>.

Skill training is not compulsory for teachers. Therefore, teachers improve their skills on their own initiative. However, some local boards of education provide skill training opportunities on an irregular basis. Such training includes on-site experience type by internship (for several days to several months) to companies and training type by cooperation with Polytechnic University.

### 4.8 Teachers' Organizations<sup>45</sup>

Article 28 of the Japanese Constitution guarantees fundamental rights to workers, including the right to organize. Concrete examples of this right include organizations like a labor union based on the Labor Union Law in relation to employers and employees in the private sector, and an organization of personnel based on the Government Officials Act or the Local Government Officials Act in the case of teachers at public schools in Japan. An organization of personnel is a group or a federation of bodies organized for the purpose of maintaining and improving working conditions. Its main role is to hold negotiations with the authorities (the employer) over employees' salaries, working hours, and other working conditions and additionally with matters concerning to legal activities, including social or welfare-related activities.

<sup>44</sup> From the results of interviews with teachers of specialized course (industry)

<sup>45</sup> MEXT [2005] "Attracting, Developing and Retaining Effective Teachers"

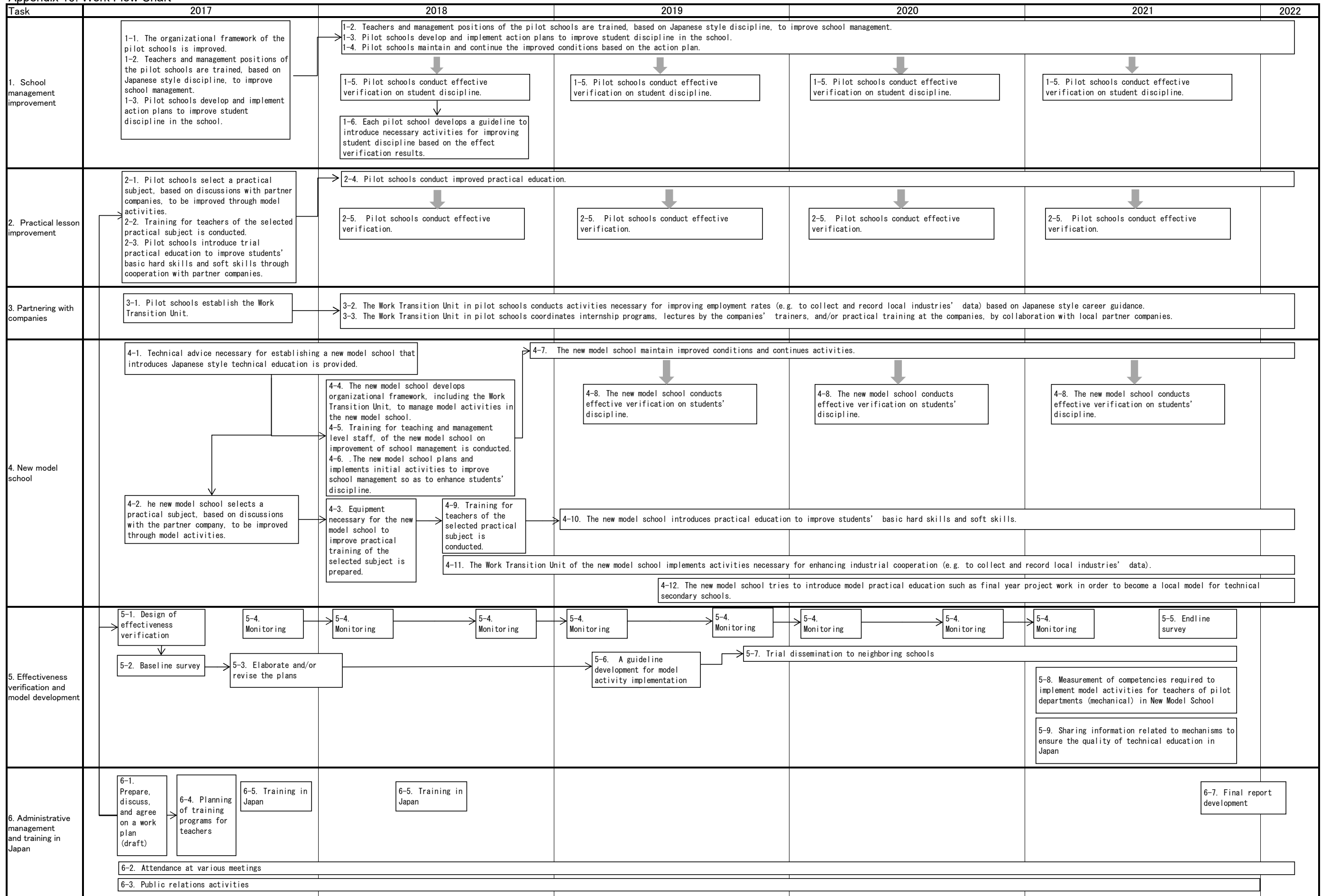
There are about 820,000 teachers in public schools in Japan<sup>46</sup>. As of 2019, there were five organizations composed of teachers at public schools. They were the Japan Teachers Union (Nikkyoso), the All Japan Teachers and Staffs Union (Zenkyo), the Japan Senior High School Teachers Union (Nikkokyo-Uha), the National Teachers Federation of Japan (Zennikkyoren) and the Japan Educational Administrators Association (Zenkankyo).

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<sup>46</sup> Aggregated the information on the following web pages:  
[https://www.mext.go.jp/b\\_menu/toukei/002/002b/1417059\\_00003.htm](https://www.mext.go.jp/b_menu/toukei/002/002b/1417059_00003.htm)

**Appendix 10**  
**Work Flow Chart**

Appendix 10: Work Flow Chart





## **Appendix 11**

# **Comparison between Activity Plan and Result**





**Appendix 12**  
**Endline Survey Report**

**The Project for Enhancement of Technical  
Secondary Education**

**Endline Survey Report**

**March 2022**

**PADECO Co., Ltd.**



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## **Abbreviations and Acronyms**

3S	Sort/Set in order/Shine
ATS	Applied Technology School
JPT	JICA Project Team
MOETE	Ministry of Education and Technical Education
NM	New Model School
OVI	Objectively Verifiable Indicators
PDM	Project Design Matrix
PR	Production according to Request
PS	Pilot School
RMG	Ready-Made Garment
SB	Safe Behavior
School A	Dr. Ahmed Zewail School for Dual Education for Girls
School EA	El Araby School for Applied Technology
School ES	El Sewedy School for Applied Technology
School O	Al Obour Industrial Secondary School
School P	Port Said Technical Secondary School for Girls
School T	El Tahrir Technical Secondary School for Girls
SEWS	Sumitomo Electric Wiring Systems, Inc.
TM	Time Management



# 1. INTRODUCTION

## (1) Background of Survey

The overall goal of the Project Design Matrix (PDM) is “The model activities for technical secondary schools that introduce Japanese-style technical education are disseminated in Egypt”. There is also a description of “Japanese-style technical education” on each Output. Thus, this project is meant to refer to “Japanese-style technical education”. However, no document or book defines Japanese-style technical education in Japan. Nevertheless, the educational methods used in Japan’s upper secondary schools (specialized course: industry) are quite different from those used in technical secondary schools in Egypt, and the same methods are used throughout Japan. This is thought to be a result of Japanese culture. Therefore, the Project defined “Japanese-style technical education” and included it in “Guideline for Practical Lesson Improvement”.

“Guideline for Practical Lesson Improvement” aims to develop students with “**competencies**” in technical secondary schools to develop human resources that meet the needs of industry. “Guideline for Practical Lesson Improvement” defines a person with competency as the person who has knowledge, skill, and sense of purpose and attitude to perform using the knowledge and skills. There are various types of competencies, however, “Guideline for Practical Lesson Improvement” defines that technical secondary schools should aim to focus instruction mainly on the following four competencies required by companies and have students acquire them through practical lessons.

- PR: Production according to Request
- SB: Safe Behavior
- 3S: Sort/Set in order/Shine
- TM: Time Management

The Project defined the instruction method “repetitive practice and repetitive instruction” to Japanese-style technical education, and described model activities for students to acquire four main competencies in “Guideline for Practical Lesson Improvement” and implemented them in target schools.

## (2) Objectives of the Survey

The objective of the survey is to measure the effectiveness of the model activities and to verify the validity of the model activities. To measure the effectiveness, the Project conducted nine surveys: one baseline survey before introducing the model activities, one endline survey after introducing the model activities, and seven monitoring surveys every six months in between. Comparison with the baseline survey will be made to examine the validity of the model activities and draw lessons for introducing the model activities.

## 2. METHODOLOGY

This chapter explains the details of methodologies adopted for the survey.

### 2.1 Scope of the Endline Survey Report

The Objectively Verifiable Indicators (OVIs) of the PDM for the Project include OVIs for verifying the validity and effectiveness of the model activities and OVIs for tracking the progress of project activities. The endline survey targets the former. The right column of Table 2-1 shows the OVIs covered in this report. The achievement level of the PDM, including the latter, will be described in the Project Completion Report.

**Table 2-1 Target OVIs of this Report**

Narrative Summary	OVI	Target
Overall Goal: The model activities for technical secondary schools that introduce Japanese style technical education are disseminated in Egypt.	20 technical secondary schools have introduced the model activities in electrical & electronics and mechanical departments.	
	70% of private companies that employ graduates from the technical secondary school that have introduced the model activities are satisfied with the graduates.	✓
Project Purpose: The model activities for technical secondary schools that introduce Japanese-style technical education are established at pilot schools and a New Model school.	1. Guidelines for introducing Japanese-style technical education are approved by MOETE for expansion.	
	2. The rate of students satisfied with the Japanese-style classes given at the technical secondary schools that have introduced the model activities: 70%	✓
	3-1. (Dual system) The rate of graduates who sought jobs, thereafter, have obtained those at the technical secondary schools that have introduced the model activities: 80%	✓
	3-2. (Conventional system) The rate of graduates who sought jobs, thereafter, have obtained those at the technical secondary schools that have introduced the model activities: 20%	✓
Output 1: School management at pilot schools is improved through introducing Japanese-style school management systems.	1-1. The rate of teachers starting lessons on time: 90%	✓
	1-2. The rate of students rightly seated at the starting time of lessons: 90%	✓
	1-3. Annual submission of achievement reports based on the guidelines to Idara/Mudiriya/MOETE	
Output 2: Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools	2-1. The rate of students' products graded as "Good": 30%	✓
	2-2. The rate of students properly wearing clothes according to the safety standard of the practical lessons: 95%	✓
	2-3. The rate of tools and materials properly restored after use at the end of the practical lessons: 95%	✓
	2-4. Annual submission of achievement reports based on the guidelines to Idara/Mudiriya/MOETE	
Output 3: Local companies and pilot schools are cooperating with each other.	3-1.1. (Dual system) collaborative activities implemented with local private companies: 4 activities per year	✓
	3-1.2. (Conventional system) collaborative activities implemented with local private companies: 6 activities per year	✓
	3-1-3. The rate of graduates' placement records: 50%	✓
Output 4: A new model school that introduces Japanese style technical education is in operation.	4-1. The rate of teachers starting lessons on time: 90%	✓
	4-2. The rate of students rightly seated at the starting time of lessons: 90%	✓
	4-3. The rate of students' products graded as "Good": 30%	✓
	4-4. The rate of students properly wearing clothes according to the safety standard of the practical lessons: 90%	✓

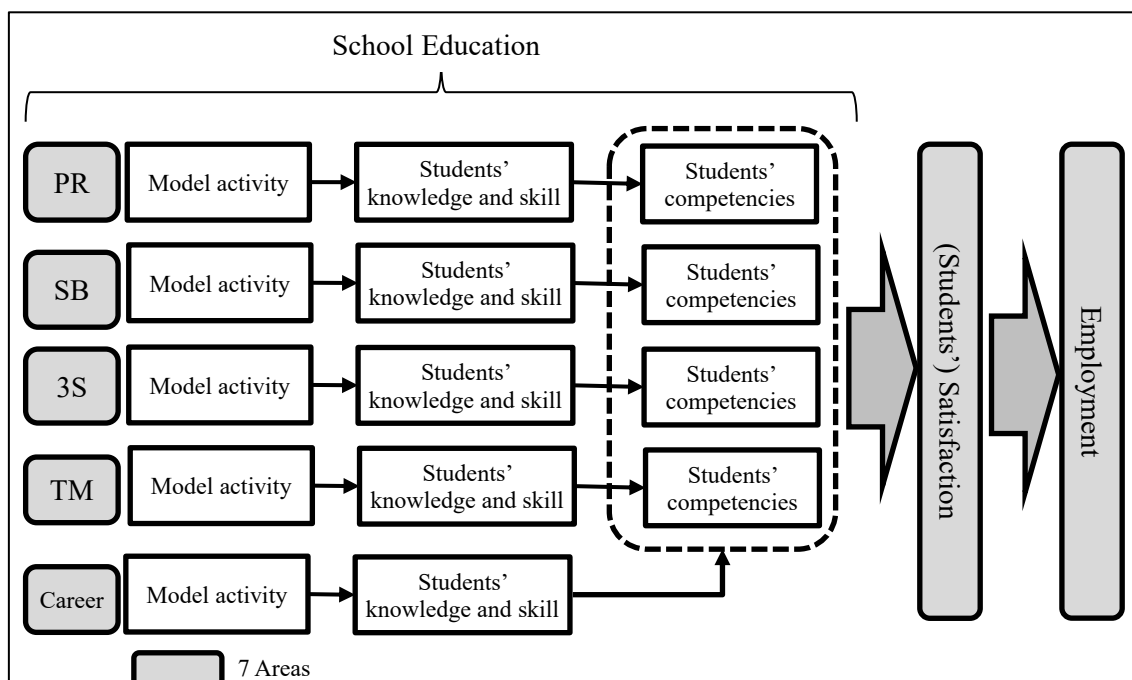
Narrative Summary	OVI	Target
	4-5. The rate of tools and materials properly restored after use at the end of the practical lessons: 95%	✓
	4-6. Collaborative activities implemented with local private companies: 4 activities per year	✓
	4-7. The rate of career development information of the students: 50%	✓
	4-8. Training programs conducted based on the guidelines for teaching and management level staff: 5 programs per year	✓

Source: JICA Project Team (JPT)

## 2.2 Survey Design and Methodology

### (1) Survey Design

Seven areas to measure in the survey are designated: PR, SB, 3S, TM, career, (students’) satisfaction, and employment. Four of the seven areas are taken from “four main competencies” in “Guideline for Practical Lesson Improvement”. Students are expected to acquire those four main competencies (PR, SB, 3S, and TM) during their school days. For students to acquire those four main competencies, the school should implement the **activities** so that students could acquire the necessary knowledge and skills. This is supported by the school’s awareness-raising **activities** regarding the future careers of students. As the school continues these practices, students will continuously behave correctly with correct knowledge and skill, which means that students could acquire competencies in four areas. In this report, these five areas (PR, SB, 3S, TM, and career) are referred to as “school education”. The Project designed model activities that referred to Japanese-style technical education in these five areas. This would result in students’ satisfaction with school education. As a result, the satisfaction of the companies with the graduates would also increase. This is the MODEL and survey design. Figure 2-1 shows this model.



Source: JPT

**Figure 2-1 Areas to Measure in the Survey and their Structure to Reach Satisfaction and Employment**

## (2) Survey Methodology

Survey methodology is divided into two parts, one for school education and another for the result of school education (students' satisfaction and employment).

Table 2-2 summarizes the survey method with each point of view for five areas of measurement in the survey. The model activities and students' knowledge and skill in Figure 2-1 are combined as "a) students' knowledge and skill through model activities" in Table 2-2.

**Table 2-2 Survey Method of School Education**

Area	a) Students' Knowledge and Skill through Model Activities	b) Students' Competencies
PR	(1) Questionnaire for students	(4) Product assessment
SB	(1) Questionnaire for students (2) Visual confirmation or interviews with teachers	(3) Lesson observation
3S	(1) Questionnaire for students (2) Visual confirmation or interviews with teachers	(3) Lesson observation
TM	(1) Questionnaire for students (2) Visual confirmation or interviews with teachers (3) Lesson observation	(3) Lesson observation
Career	(1) Questionnaire for students (2) Visual confirmation or interviews with teachers	

Source: JPT

Each area of school education is analyzed from two points of view: a) students' knowledge and skill through model activities, and b) students' competencies. In the survey, a) is examined if the school defines expected students' competencies in each area and implements activities to make students acquire them (model activities), and if the students know what they should do (students' knowledge and skill). b) is examined if the students can perform the expected competencies defined. There is no b) in career.

The survey for a) students' knowledge and skill through model activities in PR, SB, 3S and TM is examined by (1) questionnaire for students, (2) visual confirmation or interviews with teachers, and (3) lesson observation. The survey for b) students' competencies in PR, SB, 3S and TM is examined by (3) lesson observation or (4) product assessment. The survey for a) students' knowledge and skill through model activities in career is examined by (1) questionnaire for students and (2) visual confirmation or interviews with teachers.

Table 2-3 shows the survey methods of students' satisfaction and employment. Satisfaction is examined by (1) questionnaire for students. Employment consists of two items, and each of them is examined by a different survey method: (5) telephone interview with graduates or (6) interview with partner companies. The survey methodology for others (students' satisfaction and employment) does not have the above structure but it is an individual survey.

**Table 2-3 Survey Method by Area of Students' Satisfaction and Employment**

Area	Items	Survey Method
Satisfaction		(1) Questionnaire for students
Employment	The rate of graduates who sought jobs have obtained them.	(5) Telephone interview with graduates
	Private companies that employ graduates from the technical secondary schools that have introduced the model activities are satisfied with the graduates.	(6) Interview with partner companies

Source: JPT

Appendix A shows the details of each survey method other than (4) product assessment. Appendix B shows the detail of (4) product assessment.

## 2.3 Survey Target

### (1) School and Department

Table 2-4 shows the target schools where the Project has introduced the model activities. The target schools are classified into two categories, Pilot Schools, and New Model Schools. Pilot Schools were selected from the existing technical secondary schools, i.e., conventional technical secondary schools and dual education schools<sup>1</sup>. New Model Schools refer to Applied Technology School (ATS)<sup>2</sup> that MOETE introduced in the 2018/2019 school year. Each school is given an abbreviation in Table 2-4, and this abbreviation will be used within this report.

**Table 2-4 List of Target Schools**

Classification	School Name	School Type	School Abbreviations	Location
Pilot School	Dr. Ahmed Zewail School for Dual Education for Girls	Dual	School A	Port Said Governorate
	Port Said Technical Secondary School for Girls	Conventional	School P	
	El Tahrir Technical Secondary School for Girls	Conventional / Dual <sup>3</sup>	School T	
	Al Obour Industrial Secondary School	Dual <sup>4</sup> / Conventional	School O	Kalyoubia Governorate
New Model School	El Araby School for Applied Technology	ATS	School EA	Monufia Governorate
	El Sewedy School for Applied Technology	ATS	School ES	Sharqia Governorate

Source: JPT

Among the target schools, four Pilot Schools were selected from schools that had established or planned to establish partnerships with Japanese-affiliated companies. New Model Schools were also selected from schools that have relationships with companies with ties to Japan.

There are two types of model activities: activities for the whole school and activities for the pilot departments selected in each target school. The intervention start dates for each school and department are divided into three groups: October 2017-, October 2018-, and October 2021. Table 2-5 shows the pilot departments of the target schools and the intervention start dates for each target school and pilot department.

<sup>1</sup> The study hours for conventional technical secondary schools and dual education schools are different. Study hours at conventional technical secondary schools are organized into general subjects, common subjects, and elective subjects. The study hours at dual education schools are used for general subjects, technical subjects, and specialized practical lessons, which are training sessions in a factory.

<sup>2</sup> ATSs are technical secondary schools that are co-operated by MOETE and private companies with the purpose of providing international standards level technical education. Private companies are required for support for the improvement of school facilities and practical lesson equipment, as well as to provide opportunities for factory training, but the content of support can be changed flexibly between each school and each private company.

<sup>3</sup> Only the Ready-Made Garment (RMG) department has both conventional classes and dual classes. The other departments have only conventional classes.

<sup>4</sup> The Project targets one of the dual departments in School O.

**Table 2-5 Timing of Starting Intervention for Pilot Departments**

Classification	School	Pilot Department	1 <sup>st</sup> group (Oct. 2017-)	2 <sup>nd</sup> group (Oct. 2018-)	3 <sup>rd</sup> group (Oct. 2021-)
Pilot School	School A	Electronics	✓		
	School P	Electronics	✓		
	School T	Electronics	✓		
		Electricity			✓
		Computers			✓
		Decoration			✓
	Ready-Made Garment (RMG)			✓	
School O	Mechanical maintenance	✓			
New Model School	School EA	Mechanics		✓	
	School ES	Mechanics			✓
		Electric			✓

Source: JPT

In the 1<sup>st</sup> group with four Pilot Schools, only one pilot department was selected in each Pilot School: the mechanical maintenance department in School O and the electronics department in the other three schools. In the 2<sup>nd</sup> group, only the mechanics department was selected in School EA. In the 3<sup>rd</sup> group, all the departments of School T and all the departments of School ES (electric and mechanics) became pilot departments.

The duration of the intervention by the Project differed greatly between the groups: the 1<sup>st</sup> group intervened for four years and two months from October 2017 to the endline survey (November 2021), the 2<sup>nd</sup> group intervened for three years and two months from October 2018, the 3<sup>rd</sup> group intervened for two months from October 2021.

## 2.4 Survey Schedule

Surveys other than (4) product assessment were conducted every six months, for a total of nine times. The survey period of each survey and the schools surveyed are summarized in Table 2-6. The first survey for each school is called the baseline survey, the last survey is called the endline survey, and the surveys in between are called monitoring surveys. The main focus of this report is a comparison between the baseline survey and endline survey.

**Table 2-6 Survey Schedule other than Product Assessment**

Survey Number	Survey period	Number of Schools Surveyed		Total Number of Schools Surveyed
		Pilot School	New Model School	
No. 1	Apr.-Nov. 2017	4		4
No. 2	Feb.- Apr. 2018	4		4
No. 3	Oct.-Nov. 2018	4	1	5
No. 4	Feb.-Mar. 2019	4	1	5
No. 5	Sep.-Nov. 2019	4	1	5
No. 6	Feb.-Mar. 2020	4	1	5
No. 7	Oct.-Nov. 2020	4	1	5
No. 8	Feb.-Apr. 2021	4	2	6
No. 9	Nov.-Dec. 2021	4	2	6

Source: JPT

Table 2-7 shows the assessment target of (4) product assessment. The decoration department of School T did not have any student products at the time of the baseline survey, so the teachers'



products were assessed. In addition, there is no baseline data for School EA, as School EA received a lot of training before the opening of the school.

**Table 2-7 Target of (4) Product Assessment**

School	Department	Baseline	Endline
A	Electronics	Products of students graduated in June 2017	Products of students graduated in June 2021
P	Electronics	Ditto	Ditto
T	Electronics	Ditto	Ditto
	Electricity	Ditto	Products of Grade 2 students created in the 2021/2022 school year
	Computers	Ditto	Ditto
	Decoration	Products of teachers before skill training implementation	Products of teachers after skill training implementation
	RMG	Products of students created in the past	Products of students created in November 2021
O	Mechanical maintenance	Products of students graduated in June 2017	Products of students graduated in June 2021
EA	Mechanics	No baseline data due to many instances of training before the school opened	Products of Grade 1 students created in the 2021/2022 school year
ES	Mechanics	Products of Grade 1 Students created in the 2020/2021 school year	Ditto
	Electric	Ditto	Ditto

Source: JPT

## 2.5 Respondent for the Endline Survey

Table 2-8 shows the number of students who responded to (1) questionnaire for students. The number of students who participated in a single school varied from 25 to 319.

**Table 2-8 Number of Students Responded for (1) Questionnaire for Students**

Classification	School	By Sex		Total
		F	M	
Pilot School	School A	46	0	46
	School P	25	0	25
	School T	97	0	97
	School O	0	60	60
New Model School	School EA	0	131	131
	School ES	0	319	319
Total		168	510	678

Source: JPT

Table 2-9 shows the number of principals/teachers who participated in (2) visual confirmation or interviews with teachers.

**Table 2-9 Number of Teachers Interviewed for (2) Visual Confirmation or Interviews with Teachers**

Classification	School	Number of Teachers
Pilot School	School A	3
	School P	3
	School T	5
	School O	2
New Model School	School EA	3
	School ES	3
Total		19

Source: JPT

Table 2-10 and Table 2-11 show the information of observed lessons. All observations were conducted between the period of November to December 2021. Both theoretical lessons and practical lessons were observed in all target schools.

**Table 2-10 Number of Theoretical Lessons Observed for (3) Lesson Observation**

Classification	School	Department	Number of Lessons Observed
Pilot School	A	Electronics	8
	P	Electronics	5
		Electronics	5
	T	Electricity	5
		Computers	5
		Decoration	5
		RMG	2
	O	Mechanical maintenance	6
New Model School	EA	Mechanics	11
	ES	Mechanics	11
		Electric	8
Total			71

Source: JPT

**Table 2-11 Number of Practical Lessons Observed for (3) Lesson Observation**

Classification	School	Department	Number of Lessons Observed for Each Area		
			TM	SB	3S
Pilot School	A	Electronics	4	4	3
	P	Electronics	4	5	2
		Electronics	7	8	0 <sup>*1</sup>
	T	Electricity	6	7	4
		Computers	7	7	1
		Decoration	7	7	0 <sup>*1</sup>
		RMG	8	13	1
	O	Mechanical maintenance	4	5	5
New Model School	EA	Mechanics	8	8	8
	ES	Mechanics	8	8	8
		Electric	8	8	8
Total			71	80	40

Source: JPT

\*1: Students did not have any opportunity to return tools for reasons such as using their tools

Table 2-12 shows the number of products assessed for (4) product assessment in the endline survey.

**Table 2-12 Number of Products Assessed for (4) Product Assessment**

Classification	School	Department	Number of Products Assessed
Pilot School	A	Electronics	22
	P	Electronics	27
	T	Electronics	11
		Electricity	8
		Computers	8
		Decoration	6
		RMG	4
O	Mechanical maintenance	32	
New Model School	EA	Mechanics	16
	ES	Mechanics	47
		Electric	23

Source: JPT

Table 2-13 shows information regarding the telephone interview with graduates or their parents. The phone numbers of the students/parents were obtained through the teachers at each school.

**Table 2-13 Number of Graduates Interviewed for (5) Telephone Interview with Graduates**

Classification	System	Number of Graduates Interviewed
Pilot School	Dual System	73
	Conventional System	41
New Model School <sup>5</sup>		38
Total		152

Source: JPT

## 2.6 Limitations

This survey has three main limitations.

First, the Project started its pilot activities for Pilot Schools in October 2017 but, before that, pre-pilot activities for Pilot Schools were conducted in 2016. In the pre-pilot activities, activities mainly related to 3S, SB, and career were conducted under the guidance of Japanese experts. Since the baseline survey was conducted in October-November 2017, the baseline data for 3S, SB, and career were affected by the pre-pilot activities and it is not the data before the introduction of the model activities.

Second, this report is limited by the paucity of comparative data. At the time of the baseline survey, the Project attempted to select control schools based on four criteria: 1) there should be similarity in the local economy (neighborhood schools), 2) the schools should have the same department as the pilot department, 3) the schools should offer the same type of education (dual or conventional), and 4) the school should have the same gender of students. However, there were no schools that met these requirements. In addition, School EA was the first New Model School that just opened in 2018, so there were no schools to compare. Further, School EA, did not have baseline data because a substantial amount of input was provided before the school opened. Thus, there is a limitation of having little comparative data.

Finally, the impact of the COVID-19 outbreak on the project and the schools was significant and likely influenced the endline survey data, which is necessary to assess the validity of the model activities. For example, schools were closed for longer periods, resulting in fewer periods of

<sup>5</sup> School ES opened in September 2019 and therefore did not have any graduates at the time of the endline survey.

instruction from teachers to students. As a result, five-minute break, one of the model activities for time management, could not be implemented due to the shortened school hours. Collaborative activities with local companies were also interrupted at all target schools. Since some schools were unable to fully implement the model activities, the effectiveness of the model activities may have been compromised, which limits the validity of the study.

### 3. RESULTS OF THE SURVEY

In this chapter, the results of the endline survey are compared with those of the baseline survey for the five areas of school education (PR, SB, 3S, TM, and career) and the outcomes of school education, i.e., students' satisfaction and employment, as presented in Section 2.2. For New Model Schools, no baseline survey result is available due to the reasons as indicated in Section 2.2. The results of the endline survey are as follows.

- **School Education:** School education in Pilot Schools has improved compared to the baseline result. In particular, PR and TM students' competency improved significantly from the baseline: the rate of students' products grades "good" improving by 57 percentage points to 59% in PR, and the rate of students rightly seated at the starting time of practical lessons improving by 52 percentage points to 87% in TM. The achievement of New Model Schools was higher than that of Pilot Schools.
- **Satisfaction and Employment:** Satisfaction and employment in Pilot Schools improved compared to the baseline result. Satisfaction and employment at New Model Schools improved compared to the baseline result, with New Model Schools achieving higher levels than Pilot Schools.

#### 3.1 School Education

Pilot Schools and New Model Schools implemented model activities referring to Japanese-style technical education and, in Pilot Schools, students' four major competencies improved significantly from the baseline. New Model Schools also improved in the students' PR competency and achieved high levels in the other three competencies. The improvement in PR, which is the core of the four competencies, was particularly noteworthy. Implementation of model activities in career that aimed to help students understand the usefulness of the four competencies was also facilitated.

##### 3.1.1 PR: Production according to Request

###### Summary of Impact on PR

- Improvements in the practical lessons were observed in both Pilot Schools and New Model Schools.
- Student' competency (rate of product graded as "good") improved by 57 percentage points to 59% in Pilot Schools and by 55 percentage points to 81% in New Model Schools compared to the baseline result.

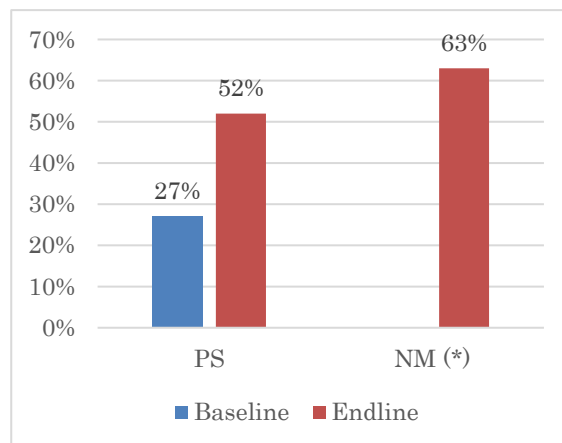
PR is a basic skill required by the industry. In the Project, teachers learned the correct skills through skills training and learned how to conduct "repetitive practice and repetitive instruction" through the Guideline training.

#### (1) Students' Knowledge and Skill through Model Activities

In this section, the implementation of the model activities in the practical lessons is analyzed based on the students' recognition of the practical lessons.

1) Advance notice of topics

If students understand the purpose of the practical lessons, they will be able to engage in the lessons with a sense of purpose, which will increase their learning effectiveness. For this reason, “Guideline for Practical Lesson Improvement” recommends that students be given advance notice of the practical lesson topic. Figure 3-1 shows the rate of students who answered: “At the beginning of the semester or a few days before the lesson” to the question “When do you first know what you practice in a practical lesson?”. Pilot Schools improved significantly, from 27% in the baseline survey to 52% in the endline survey, an increase of 25 percentage points. New Model Schools went even further, reaching 63% in the endline survey.

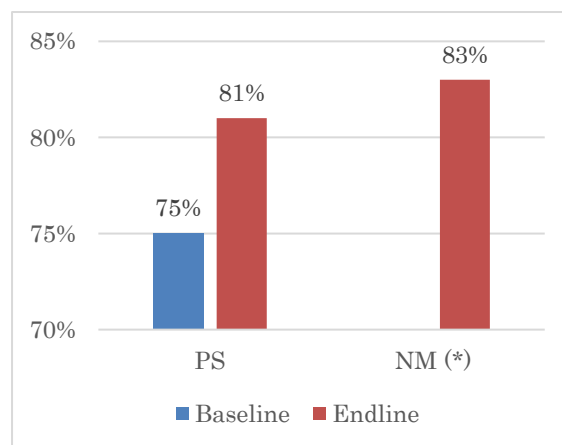


Source: (1) Questionnaire for students  
\*NM has no baseline data

**Figure 3-1 Rate of Students Who Know the Topic Before the Lesson**

2) How to learn about correct work

For students to learn how to work correctly, it is more effective to show them how to do it in practice than in classroom lectures. For this reason, “Guideline for Practical Lesson Improvement” recommends teacher demonstration. Figure 3-2 shows the rate of students who choose “a) By teachers’ demonstration at the lesson” to the question, “How do you usually get to know how to practice before each topic in a practical lesson?” from the following three responses: a) By teachers’ demonstration at the lesson, b) By teachers’ verbal instruction at the lesson without demonstration, and c) By reading a textbook or signboard. Pilot Schools improved by six percentage points from 75% in the baseline survey to 81% in the endline survey, and New Model Schools again went even further, reaching 83%.

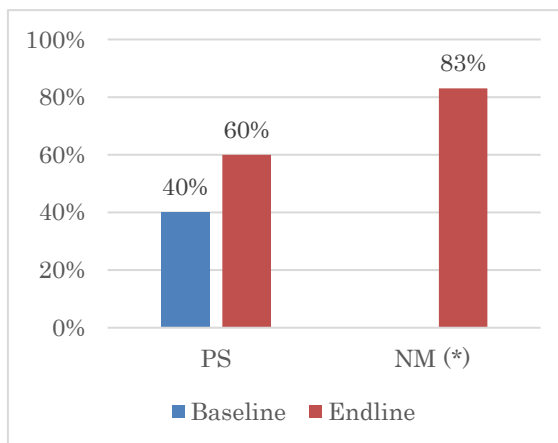


Source: (1) Questionnaire for students  
\*NM has no baseline data

**Figure 3-2 Rate of Students Who Know What to do by Teachers’ Demonstration**

### 3) Working hours

Working longer will lead to retention of knowledge and skills. Therefore, it is important to secure a longer work time in the practical lessons. Theoretical explanations are also necessary for practical lessons, and it is not necessary to devote all of the time in the practical lessons to work, but it is necessary to devise ways to secure work time. Figure 3-3 shows the rate of students who chose “a) Every lesson” to the question “How often do you use tools in practical lessons?” from the following three responses: a) Every lesson, b) Half of the lesson, and c) I do not use them. Pilot Schools improved by 20 percentage points from 40% in the baseline survey to 60% in the endline survey. New Model Schools are at 83% in the endline survey, with many students feeling that they are doing the work in every lesson.



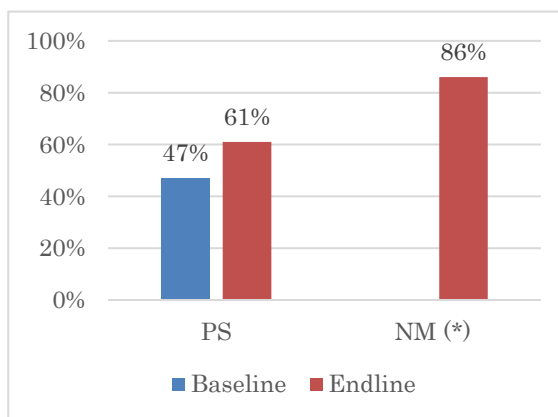
Source: (1) Questionnaire for students

\*NM has no baseline data

**Figure 3-3 Rate of Students Who Said They Use Tools in Every Lesson**

### 4) Interest in the practical lessons

The more students like the practical lessons, the more effectively they can acquire knowledge, skills, and competencies. Teachers need to devise various ways to improve practical lessons and make them more interesting for the students. Figure 3-4 shows the rate of students who chose “a) Practical lessons of technical subjects” to the question “Which do you like the best in your school life?” from the following three responses: a) Practical lessons of technical subjects, b) Theoretical lessons of technical subjects, and c) Non-technical subjects. In Pilot Schools, the rate improved by 14 percentage points from 41% in the baseline survey to 61% in the endline survey. In New Model Schools, 86% of the students chose a) in the endline survey, suggesting that many students find the practical lessons very meaningful.



Source: (1) Questionnaire for students

\*NM has no baseline data

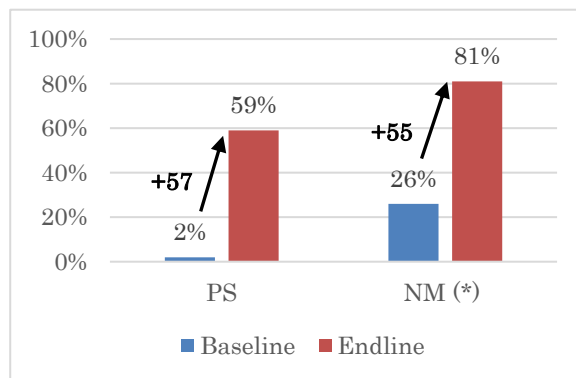
**Figure 3-4 Rate of Students Who Like Practical Lessons the Best in School Life**

Thus, it was confirmed that the practical lessons were greatly improved in Pilot Schools. In addition, it was also confirmed that New Model Schools have developed practical lessons much better than Pilot Schools.

## (2) Students' Competencies

Students' competency in PR was assessed by evaluating the product. Evaluation criteria were developed for each type of product, and the product was graded according to these criteria. As a result of the grading, the products were classified into three levels: good (over 80 points), acceptable (60-80 points), and not acceptable (under 60 points).

Figure 3-5 shows the rate of products graded as "good". Pilot Schools improved by 57 percentage points from 2% in the baseline survey to 59% in the endline survey. New Model Schools improved by 55 percentage points from 26% in the baseline survey to 81% in the endline survey.



Source: (4) Product assessment

\* School ES only. School EA has no baseline data

**Figure 3-5 Rate of Product Graded as Good**

Table 3-1 shows the rate of products graded as "good" by classification and department.

**Table 3-1 Rate of Product Graded as Good by Classification and Department**

Classification	Department	School	Baseline	Endline	Diff
Pilot Schools	Electronics	A, P, T	3%	37%	+34
	Mechanical maintenance	O	0%	6%	+6
	Electricity	T	3%	100%	+97
	Computers	T	3%	75%	+72
	RMG	T	0%	50%	+50
	Decoration	T	0%	83%	+83
New Model Schools	Mechanics	EA, ES	2%	61%	+59
	Electric	ES	50%	100%	+50

Source: (4) Product assessment

Improvements were observed in all pilot departments of Pilot Schools and New Model Schools. In particular, the pilot departments added for the extension period (electricity, computers, RMG, and decoration of Pilot Schools and electric and mechanics of New Model Schools) improved by more than 50 percentage points. These pilot departments were characterized by the short-term intensive input and the short interval between input and assessment. For example, in the electricity department of School T, eight students were given one day-intensive remedial training, and 100% of their products were graded as "good" with 97 percentage points improvement.

Thus, it was observed that the students' competencies at Pilot Schools and New Model Schools improved significantly.



### 3.1.2 SB: Safe Behavior

<p>Summary of Impact on SB</p> <ul style="list-style-type: none"> <li>In Pilot Schools, 1) safety rules were defined and documented, 2) students’ awareness of safety rules improved significantly, and 3) repetitive instruction by teachers improved. New Model Schools achieved more than Pilot Schools in these 1) - 3).</li> <li>Students’ competency (rate of students properly wearing clothes according to safety standard) improved by 46 percentage points from the baseline to 97% in Pilot Schools. New Model Schools achieved 100%.</li> </ul>
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To maintain safety in a factory, it is necessary to understand and practice safety standards. The Project assisted the target schools in developing safety standards for workshops and, in the Guideline training, the Project taught them how to conduct “repetitive practice and repetitive instructions” during practical lessons.

#### (1) Students’ Knowledge and Skill through Model Activities

For students to acquire SB competency, schools need to define the “right behavior” regarding SB. If not defined, the content of instruction will vary from a teacher to a teacher and students will be confused. Table 3-2 shows the result of interviews with teachers about a) defining safety rules inside a workshop and b) having documents or posters for safety rules in the endline survey. 20 points were given for “yes”, 10 points for “partially yes”, and 0 points for “no”. The scores were averaged for each Pilot School and New Model School.

**Table 3-2 Implementation of SB by Schools**

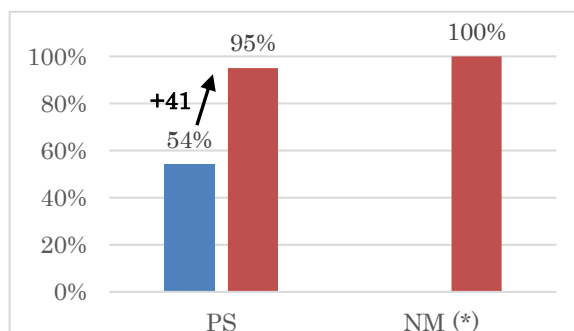
Items	PS			NM
	Baseline	Endline	Diff	Endline
a) Defining safety rules inside a workshop	20	20	±0	20
b) Having documents or posters for safety rules	15	20	+5	20

Source: (2) Visual confirmation or interviews with teachers.

Item “a) Defining safety rules inside a workshop” scored 20 points since the baseline in Pilot Schools. This can be attributed to the fact that the Project had already instructed Pilot School teachers to define safe behaviors through the pre-pilot activities in 2016 before the project started, as explained in Chapter 2. On the other hand, in “b) Having documents or posters for safety rules”, the score of Pilot Schools improved by five points from 15 points in the baseline survey to 20 points in the endline survey. New Model Schools scored 20 points in both a) and b) in the endline survey.

#### 1) Communicating rules to students

Even if the school defines and documents the rules regarding SB, if they are not communicated to the students, the students will not be able to practice them. Even if the students do practice them, it is only because the teacher instructs and enforces the rules each time ad-hoc, and it is far from the level where the students understand the rules and practice them spontaneously. Figure 3-6 shows the rate of students who answered “yes” to the question “Is there a dress code in your school workshop?”. In Pilot Schools, the



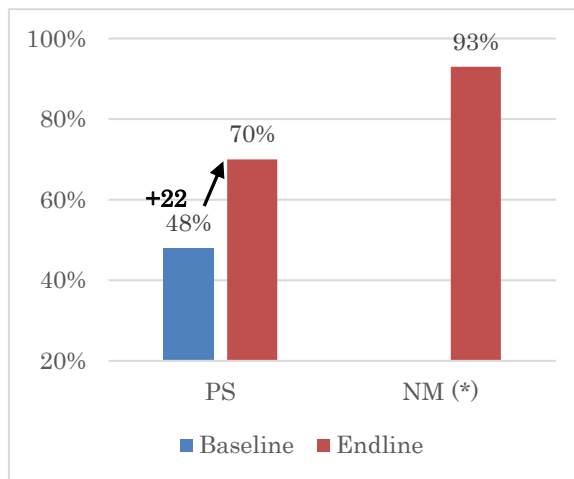
Source: (1) Questionnaire for students  
\*NM has no baseline data

**Figure 3-6 Rate of Students Who Know the Dress Code in Workshops**

rate improved by 41 percentage points from 54% in the baseline survey to 95% in the endline survey. New Model Schools achieved 100% in the endline survey.

**2) Use of repetitive instruction**

Once the school has defined, documented, and notified the students of SB (safety behavior) and the students know SB, the students are expected to practice rules defined as SB. “Repetitive practice and repetitive instruction” is the best way to make SB a habit, i.e., to acquire SB competency, and it is recommended in “Guideline for Practical Lesson Improvement”. Figure 3-7 shows the rate of students who chose “a) Teachers instructed on safety before and/or during practical lessons repeatedly” to the question “How are you instructed on safety for practical lessons mainly?” from the following three responses: a) Teachers instructed on safety before and/or during practical lessons repeatedly, b) Teachers instructed on safety before and/or during practical lessons sometimes, and c) I studied about safety using a textbook in the classroom. Pilot Schools improved by 22 percentage points from 48% in the baseline survey to 70% in the endline survey, indicating that “repetitive practice and repetitive instruction” have been introduced to a considerable extent. The rate of students in New Model Schools was 93% in the endline survey, indicating that a high level of “repetitive practice and repetitive instruction” for safety was being provided.



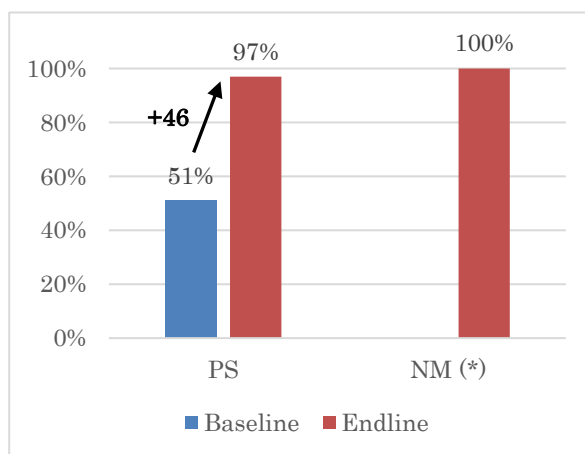
Source: (1) Questionnaire for students  
\*NM has no baseline data

**Figure 3-7 Rate of Students Who Feel that “Repetitive Practice and Repetitive Instruction” Is Provided for SB**

**(2) Students’ Competencies**

Figure 3-8 shows the rate of students properly wearing clothes according to the safety standard of the practical lessons.

Pilot Schools improved by 46 percentage points from 51% in the baseline survey to reach 97% in the endline survey. New Model Schools achieved 100% in the endline survey.



Source: (3) Lesson observation  
\*NM has no baseline data

**Figure 3-8 Rate of Students Properly Wearing Clothes According to the Safety Standard of the Practical Lessons**

### 3.1.3 3S: Sort/Set in Order/Shine

#### Summary of Impact on 3S

- Both Pilot Schools and New Model Schools were fully equipped with the definition and documentation of 3S rule. Students' awareness of 3S rule improved by 32 percentage points to 78% in Pilot Schools. In New Model Schools, the rate of 98% was achieved.
- Students' competency (rate of students returning tools after use) reached 100% in both Pilot Schools and New Model Schools.

An efficient work environment can be maintained by sorting, setting in order, and cleaning. 5S is the first letter of the five terms Sort, Set in order, Shine, Standardize, and Sustain, which are used in Japanese factories. Of these, Sort, Set in order, and Shine are daily activities and are often referred to as 3S. In a company, all employees are expected to contribute to Standardize and Sustain. On the other hand, in schools, the teachers are responsible for creating the system (Standardize) and training the students (Sustain), and the students should be responsible for implementing 3S so that students can acquire 3S competency. For this reason, the Project designated 3S as a key competency that students should have.

The Project assisted target schools in developing 3S standards for the workshop and provided the Guideline training on the methods of “repetitive practice and repetitive instruction”.

#### (1) Students' Knowledge and Skill through Model Activities

For students to acquire 3S competency, schools need to define the “correct behaviors” related to 3S and provide students with opportunities for repetitive practice. Table 3-3 shows the result of interviews with teachers about the implementation of 3S by schools. The interview consists of four questions a)-d). The questions a) and b) ask if the school has defined and documented general 3S rules. The questions c) and d) focus on tool restore rules. A score of 20 points was given for “yes”, 10 points for “partially yes”, and 0 points for “no”. The averages of the scores for Pilot Schools and New Model Schools are shown in Table 3-3.

**Table 3-3 Implementation of 3S by Schools**

Items	PS			NM
	Baseline	Endline	Diff	Endline
a) Defining 3S rules inside a workshop	20	20	±0	20
b) Having documents or posters for 3S rules	15	20	+5	20
c) Defining a rule to restore tools	15	20	+5	20
d) Having documents/posters for the rule of restore tools	0	20	+20	20
Total	50	80	+30	80

Source: (2) Visual confirmation or interviews with teachers.

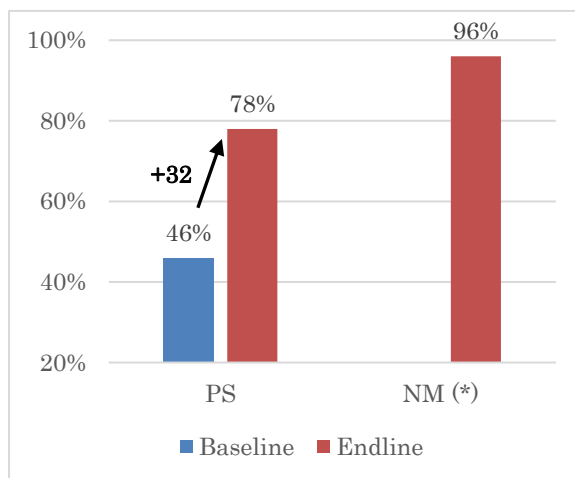
Pilot Schools, which had already achieved 50 points in the baseline survey due to practice in the pre-pilot activities, improved by 30 points to 80 points in the endline survey. New Model Schools also reached 80 points (full score) in the endline survey.

Communicating rules to students

There is a big difference between students being instructed by teachers on a case-by-case basis, and students knowing the rules and implementing them spontaneously. The school defines the rules, documents them, and then notifies the students, but if the students do not understand or remember what they are told, they will not be able to act spontaneously. Therefore, it is important that students know the rules.

Figure 3-9 shows the rate of students knowing 3S rules in the school workshop.

The rate of Pilot Schools was 46% in the baseline survey and improved by 32 percentage points to 78% in the endline survey. The rate of New Model Schools was 96% in the endline survey and was observed to have more 3S notifications than Pilot Schools.



Source: (1) Questionnaire for students  
\*NM has no baseline data

**Figure 3-9 Rate of Students Knowing 3S Rules in the School Workshop**

**(2) Students’ Competencies**

Pilot Schools focused on 3S in the pre-pilot activities implemented in 2016. Therefore, at the time of the baseline conducted in 2017, the students’ competency was already at 100%. Based on the results of the familiarity with 3S rule shown in Figure 3-9, it can be assumed that, in the baseline survey, students were unaware of the rule and restored the tool with the guidance of teachers. In the endline survey, it can be considered that the students spontaneously restored the tools based on their knowledge of the rules, indicating that students acquired 3S competency. New Model Schools also reached 100% in the endline survey.

**3.1.4 TM: Time Management**

Summary of Impact on TM

- In Pilot Schools, the level of awareness with TM rules among students improved by 62 percentage points to 74%, and the teachers’ TM competency improved significantly. The four model activities of TM have been introduced, but the practice has been affected by the COVID-19 outbreak. In New Model Schools, the level of awareness of TM among students is 88%, the degree of the implementation of the four types of activities and the teachers’ TM competencies are also very high.
- Students’ TM competency (rate of students seated at the beginning of lesson) has improved significantly. Pilot School improved by 35 percentage points in the practical lessons to 87%, and 54 percentage points in the theoretical lessons to 91%. New Model Schools achieved 100%.

TM needs to be a school-wide effort, and all teachers need to understand and cooperate with it. Principals need to decide on the creation of standards and mechanisms for teaching TM according to the school’s situation. The Project guided schools to create TM standards, and the Guideline training also conveyed a mechanism for “repetitive practice and repetitive instruction” of TM.

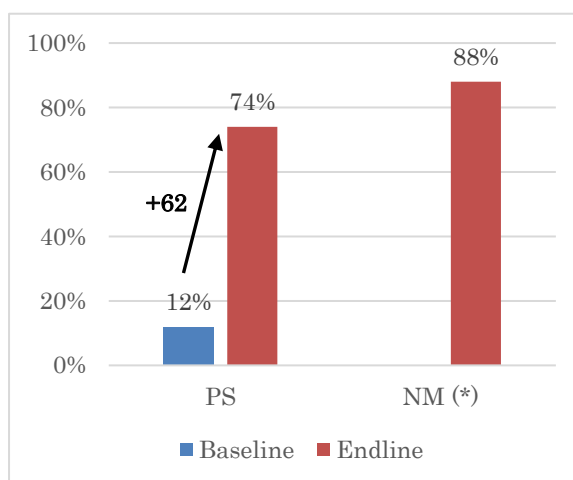
## (1) Students' Knowledge and Skill through Model Activities

For students to gain competency in TM, schools need to define the “right behaviors” related to TM and provide students with opportunities for repetitive practice. “Guideline for Practical Lesson Improvement” recommends schools implement the following three steps to prepare TM education.

- Communicate to the students what responses are to be provided if they fail to follow the standard for time management behavior (tardiness).
- Create the standard of preparation time for the next class and communicate to students (e.g., introducing five-minute breaks, displaying the one-week timetable).
- Introduce a system that allows the teachers and the students to know the time to start the next class (e.g., installing wall clocks in each classroom, installing a system to signal with a bell, etc. at the start and end of each class).

### Communicating rules to students

About a), lesson start times need to be defined and documented (e.g., posting of timetables), and penalties for tardiness need to be defined and communicated to students. In the endline survey, these had been defined and documented in all of Pilot Schools and New Model Schools. Figure 3-10 shows the rate of students who know what the school will do about tardiness or absence. In Pilot Schools, the rate improved by 62 percentage points from 12% in the baseline survey to 74% in the endline survey. In New Model Schools, the rate was 88% in the endline survey.



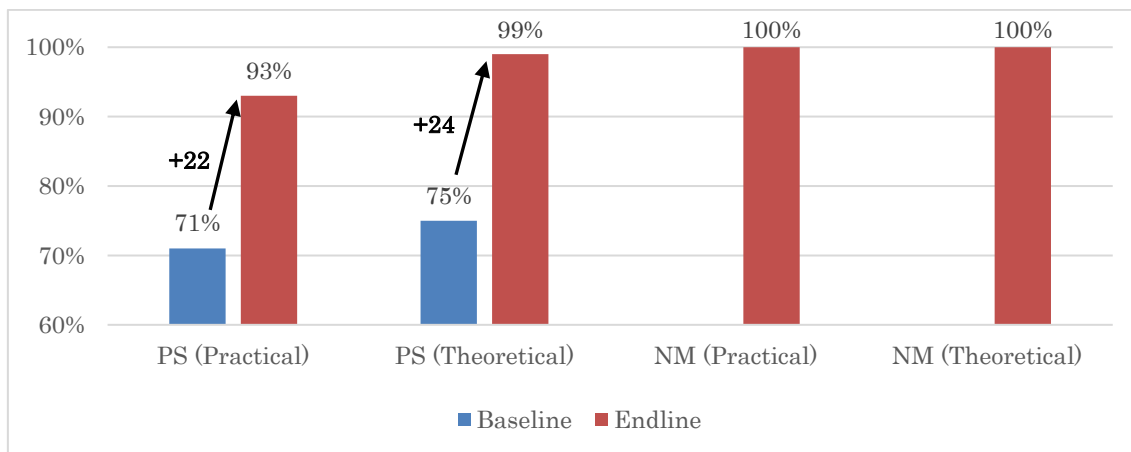
Source: (1) Questionnaire for students

\*NM has no baseline data

**Figure 3-10 Rate of Students Who Know what the School Will Do about Tardiness or Being Absent**

For b) and c), “Guideline for Practical Lesson Improvement” recommended the introduction of four activities (introduction of five-minute breaks, display of timetables, installation of wall clocks, installation of a bell system). School EA has already introduced all four activities. Pilot Schools implemented all activities except the installation of wall clocks as of November 2019. However, since the start of the COVID-19 outbreak in March 2020, five-minute breaks have been suspended in all Pilot Schools except School T because of the shortened school hours.

It is also important for teachers to be good role models for TM for students to acquire TM competencies, which is recommended in “Guideline for Practical Lesson Improvement”. Therefore, the Project investigated the teachers’ TM competencies; Figure 3-11 shows the rate of teachers who started their lesson on time.



Source: (3) Lesson observation

\* NM has no baseline data

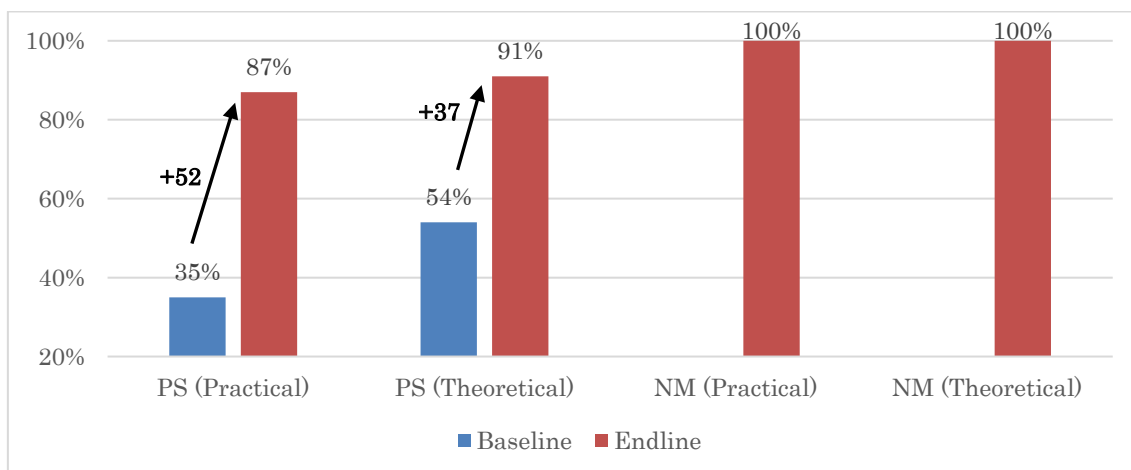
**Figure 3-11 The Rate of Teachers Starting Lessons on Time**

In Pilot Schools, 71% of the practical lessons started on time in the baseline survey and improved by 22 percentage points to 93% in the endline survey. New Model Schools achieved 100% of both practical lessons and the theoretical lessons that started on time in the endline survey.

Thus, the teachers in New Model Schools have become perfect role models in TM. Although Pilot Schools are not as good as New Model Schools, they have improved significantly compared to the baseline result, and the teachers are becoming better role models.

## (2) Students' Competencies

Students' competencies in TM were assessed by the rate of students rightly seated at the starting time of both practical lessons and theoretical lessons. Figure 3-12 shows the rate of students rightly seated at the starting time of lessons.



Source: (3) Lesson observation

\* NM has no baseline data

**Figure 3-12 The Rate of Students Rightly Seated at the Starting Time of Lessons**

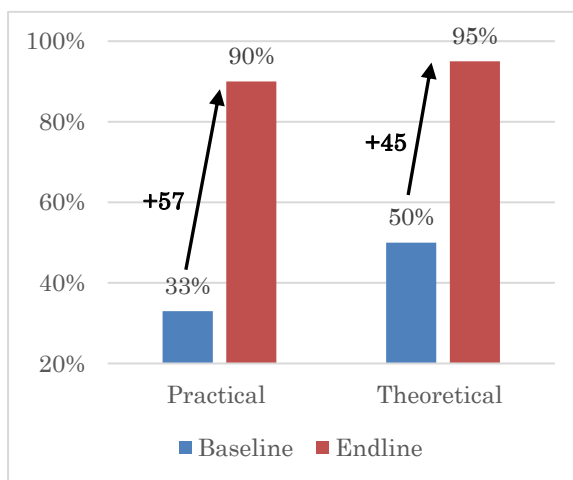
Pilot Schools improved significantly from 35% in the practical lessons and 54% in the theoretical lessons in the baseline survey to 87% in the practical lessons and 91% in the theoretical lessons, an improvement of 52 percentage points and 37 percentage points, respectively, in the endline

survey. New Model Schools achieved 100% in both the practical lessons and the theoretical lessons in the endline survey.

**(3) Results of interventions in all departments**

The Project provided inputs for PR, SB, and 3S in pilot departments of each target school, while the Project instructed school management to disseminate TM at the whole school. School A, which disseminated PR, SB, and 3S to non-pilot departments before the extension period, showed a significant school-wide improvement in TM. Therefore, MOETE pointed out that the full introduction of the model to all departments may contribute significantly to the improvement of the whole school. Therefore, the Project also provided inputs for PR, SB, and 3S in School T during the extension period. The degree of improvement in the resulting TM is reviewed here. The Project attempted to conduct lesson observations for the baseline survey of additional pilot departments in March-April 2021, before the additional input to School T. However, this was not possible because many of the lessons did not take place due to the impact of the COVID-19 outbreak. Therefore, the baseline data of the electronics department in 2017 is utilized as the baseline.

Figure 3-13 shows the rate of School T teachers starting lessons on time. As mentioned earlier, the teacher’s role model is the foundation of developing competency in students. In practical lessons, the rate improved by 57 percentage points from 33% in the baseline survey to 90% in the endline survey. In the theoretical lessons, the rate improved by 45 percentage points from 50% in the baseline survey to 90% in the endline survey.

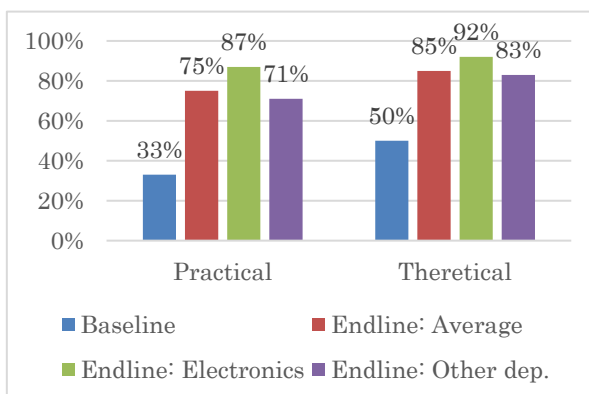


Source: (3) Lesson observation

**Figure 3-13 The Rate of School T Teachers Starting Lessons on Time**

The rate of students rightly seated at the starting time of lessons is shown in Figure 3-14. The rate was 33% for the practical lessons and 50% for the theoretical lessons in the baseline. The endline averages for all departments were 75% for the practical lessons and 85% for the theoretical lessons, an improvement of 42 and 35 points from the baseline, respectively.

The electronics department, which was the pilot department from the beginning of the project, improved by 54 points to 87% in the practical lessons and by 42 points to 92% in the theoretical lessons in the endline survey. On the other hand, the other departments improved by 38 percentage points to 71% in the practical lessons and 33 percentage points to 83% in the theoretical lessons, even though the input period was only two months from October 2021.



Source: (3) Lesson observation

**Figure 3-14 The Rate of School T Students Rightly Seated at the Starting Time of Lessons**

### 3.1.5 Career

#### Summary of Impact on Career

- The degree of cooperation with local companies has improved. Although the activities were interrupted at the time of the endline survey due to the COVID-19 outbreak, collaborative activities with local companies were actively conducted in both Pilot Schools and New Model Schools in overall.
- Pilot Schools did not collect any graduates' placement record in the baseline, but they achieved a 68% collection rate of the placement record. New Model Schools achieved a 50% collection rate of career development information.
- In Pilot Schools, the rate of students who know where to get career information increased by 37 points to 60%. New Model Schools achieved an even higher rate of 64%.

For the students to acquire the competencies required by the companies, the teachers need to conduct repetitive practice to consolidate the students' knowledge and skills. For students to be motivated to engage in the repetitive practice, teachers themselves need to know the needs of the companies by visiting them. Then, it is necessary to communicate this information in a way that students can understand. Technical secondary schools in Egypt have few contacts with companies. Therefore, the Project has recommended a) collaborative activities implemented with local private companies. In addition, as the connection with graduates is effective as a foothold for collaboration with companies, the Project recommended b) collection of graduates' placement records to Pilot Schools. For New Model Schools, the Project recommended c) collection of career development information instead of b), as there was no graduate in defining the indicator in New Model Schools. For Pilot Schools, a) and b) are evaluated while for New Model Schools, a) and c) are evaluated.

Collaborative activities with companies were actively conducted in the 2019/2020 school year: four activities at Pilot School dual system, six activities at Pilot School conventional system and three activities at one New Model School. However, after the COVID-19 outbreak around February 2020, it became difficult for the schools to implement the activities due to some irregularities such as semesters being shortened, staggered attendance, exams being implemented during the semester. As a result, the number of activities in the 2020/2021 school year in the endline survey was low. Table 3-4 shows number of collaborative activities implemented with local private companies at Pilot School dual system, conventional system and New Model Schools in the baseline survey and the endline survey.

**Table 3-4 Collaborative Activities Implemented with Local Private Companies**

Classification		Baseline	Endline	Diff
Pilot School	Dual system	0	4	+4
	Conventional system	6	6	±0
New Model School		-	3	-

Source: (2) Visual confirmation or interviews with teachers

\* As this number is the average of the number of activities in the two schools, it has a decimal point

For Pilot School dual system, the number of collaborative activities was 0 in the baseline survey, and one in the endline survey. For Pilot School conventional system, the number of collaborative activities was six in the baseline survey, and one and a half in the endline survey. The number of activities was exceptionally high at one of the schools due to pre-pilot activities in 2017. The number was one and a half in the endline survey. For New Model School, the number of activities was one in the endline survey. However, after the low activities due to the COVID-19 outbreak, in the 2021/2022 school year, the implementation of activities became active again. Furthermore,



the activities were expanded to the other department.

While the collection rate of graduates’ placement records was 0% in the baseline survey in Pilot Schools, the rate increased by 68 percentage points to 68% in the endline survey as described in Table 3-5.

**Table 3-5 The Rate of Graduates’ Placement Records**

Classification	Baseline	Endline	Difference
Pilot School	0%	68%	+68

Source: (2) Visual confirmation or interviews with teachers

The collection rate of career development information of New Model School was 50% in the endline survey as described in Table 3-6.

**Table 3-6 The Rate of Career Development Information of the Students**

Classification	Baseline	Endline	Diff
New Model School	-	50%	+50

Source: (2) Visual confirmation or interviews with teachers

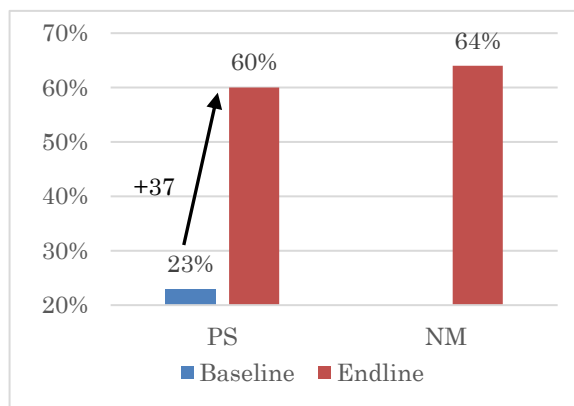
\* School ES only. School EA has no baseline data

Thus, it was observed that the activities of corporate collaboration in schools have become very active.

Communicating to students

These activities have raised awareness of teachers about companies, and this also impacted the awareness of students. Figure 3-15 shows the rate of students who know where to get career information.

The rate of Pilot Schools improved by 37 percentage points from 23% in the baseline survey to 60% in the endline survey. The rate of New Model Schools was slightly higher than that of Pilot Schools at 64% in the endline survey.



Source: (1) Questionnaire for students

**Figure 3-15 The Rate of Students Who Know Where to Get Career information**

## 3.2 Satisfaction and Employment

In this section, the satisfaction level of students and companies resulting from school education is discussed. There is improvement both in satisfaction and employment.

### 3.2.1 Satisfaction

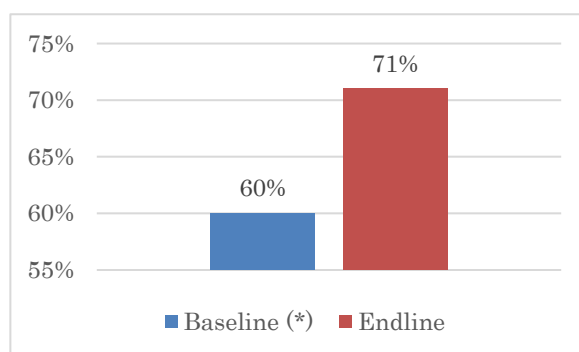
#### Summary of Impact on Satisfaction

- Target school students' satisfaction achieved 71% by 11 percentage points improvement.

Student' satisfaction was measured by the average of the following three questions.

- Do you understand the contents of the practical lessons easily?
- Do you think that you gained skills in the practical lessons?
- Do you think that the skills you gained in the practical lessons will be useful in the future?

Figure 3-16 shows the results for target schools (Pilot Schools and New Model Schools) in the baseline and the endline surveys.



Source: (1) Questionnaire for students

\* Pilot Schools only

**Figure 3-16 The Rate of Students who are Satisfied with the Target School**

Satisfaction, which was 60% in the baseline survey, improved by 11 percentage points to 71% in the endline survey. For Pilot Schools only, satisfaction improved by six points from 60% in the baseline survey to 66% in the endline survey. New Model Schools achieved 81% in the endline survey. Efforts of each school were observed despite the many negative factors, such as the shortened school hours due to the COVID-19 outbreak and the reduction in the number of hours per lesson.

### 3.2.2 Employment

#### Summary of Impact on Employment

- In the Pilot School dual system, the rate of students who sought jobs after graduation and have obtained them improved by seven percentage points to 77%, while in Pilot School conventional system, the rate improved by 38 percentage points to 67%. New Model Schools achieved an even higher rate of 89%.
- Three partner companies have hired graduates from target Pilot Schools and New Model Schools, and are satisfied with the performance of the graduates.

For employment, the following two were evaluated: (1) the rate of graduates who sought jobs have obtained them, and (2) private companies that employ graduates from the technical secondary schools that have introduced the model activities that are satisfied with the graduates.

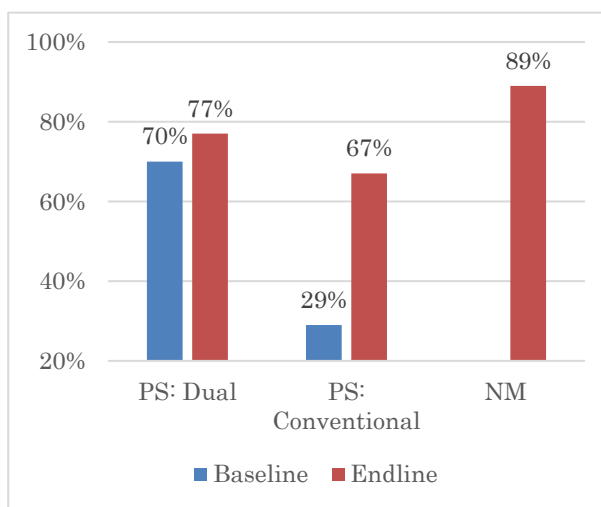
### (1) The rate of graduates who sought jobs have obtained them

Figure 3-17 shows the rate of students who sought jobs after graduation and have obtained them. The survey was conducted through telephone interviews with graduates.

In Pilot School dual system, the rate increased by seven percentage points from 70% in the baseline survey to 77% in the endline survey. The annual rate is expected to be higher as this is the rate five months after graduation in June 2021.

In the Pilot School conventional system, the rate increased by 38 percentage points from 29% in the baseline survey to 67% in the endline survey.

In New Model Schools, the rate was extremely high at 89% in the endline survey.



Source: (5) Telephone interview with graduates

**Figure 3-17 The Rate of Students Who Sought Jobs after Graduation and Have Obtained Them**

Thus, the rate of graduates who sought jobs and have obtained them has improved in all classifications. However, this figure varies widely from year to year, largely due to the influence of local economies. In the five years of data from June 2017 to June 2021, the dual system had 36 percentage points difference from the lowest of 44% (2020) to the highest of 80% (2019); the conventional system had a 54% difference from the lowest of 13% (2019) to the highest of 67% (2018, 2021).

### (2) Private companies that employ graduates from the technical secondary school that have introduced the model activities are satisfied with the graduates

The three partner companies of the project were interviewed and all three indicated that they employ graduates of target schools and are satisfied with their performance.

- El-Araby has hired 102 School EA graduates as of June 2021, and 11 are in the process of being hired. El-Araby is very satisfied with the attitudes, performance, discipline, accuracy, and punctuality of the graduates. Since El-Araby maintains a close working relationship with School EA, the school management is well aware of El-Araby's human resource needs. Therefore, School EA management believe that graduates will be role models for the current employees at the companies.
- Sumitomo Electric Wiring Systems, Inc. (SEWS) has hired 33 School A graduates in 2021 and will continue to hire more. SEWS says that teachers and the principal are of the same mind to a degree because of frequent meetings with SEWS, suggesting the importance of corporate collaboration.
- Unicham has hired seven School O graduates of June 2020 and plans to continue hiring them. Initially, 15 students were hired for an eight-month probationary period, but eight of them who worked while pursuing higher education found it difficult to continue working and decided to focus on their studies. However, for the rest of the seven graduates

who continue to work, the companies believe those graduates are even better than many senior staff members in the company.

## 4. CONCLUSION

In Chapter 3, the evaluation was based on a comparison with the baseline results. In this chapter, the achievement of the PDM indicators is evaluated and then a conclusion is made by referring to the results of Chapter 3 and the achievement level of the PDM indicators.

Table 4-1 shows achievement on the PDM. The “achievement rate” used in the table is calculated based on Japan International Cooperation Agency’s evaluation criterion of “data in the endline survey divided by the target value of the indicator”.

**Table 4-1 Achievement on the PDM**

Narrative Summary	OVI	Achievement Level	Reason
Overall Goal: The model activities for technical secondary schools that introduce Japanese-style technical education are disseminated in Egypt.	70% of private companies that employ graduates from the technical secondary school that have introduced the model activities are satisfied with the graduates.	Ongoing	Three of the three partner companies interviewed answered that they were satisfied with graduates.
Project Purpose: The model activities for technical secondary schools that introduce Japanese-style technical education are established at pilot schools and a New Model school.	2. The rate of students satisfied with the Japanese-style classes given at the technical secondary schools that have introduced the model activities: 70%	High	In the endline survey, 71% of the students were satisfied with the Japanese-style classes at the technical secondary schools where the model activities were implemented (achievement rate: 101%).
	3-1. (Dual system) The rate of graduates who sought jobs, thereafter, have obtained those at the technical secondary schools that have introduced the model activities: 80%	High	In the endline survey, the rate of graduates at the technical secondary schools that have introduced the model activities who sought jobs, thereafter, have obtained them was 77% (achievement rate: 96%) for dual system and 67% (achievement rate: 335%) for the conventional system. New Model Schools are not included in this indicator but, at School EA where the first graduates graduated in June 2021, 114 (84%) out of 136 graduates were employed or in the process of employment, and 17 (12%) went on to higher education.
	3-2. (Conventional system) The rate of graduates who sought jobs, thereafter, have obtained those at the technical secondary schools that have introduced the model activities: 20%	High	
Output1: School management at pilot schools is improved through introducing Japanese-style school management systems.	1-1. The rate of teachers starting lessons on time: 90%	High	93% (achievement rate: 103%) in the practical lessons and 99% (achievement rate: 110%) in the theoretical lessons were achieved in the endline survey.
	1-2. The rate of students rightly seated at the starting time of lessons: 90%	High	87% (achievement rate: 97%) <sup>6</sup> in the practical lessons and 91% (achievement rate: 101%) in the theoretical lessons were achieved in the endline survey.

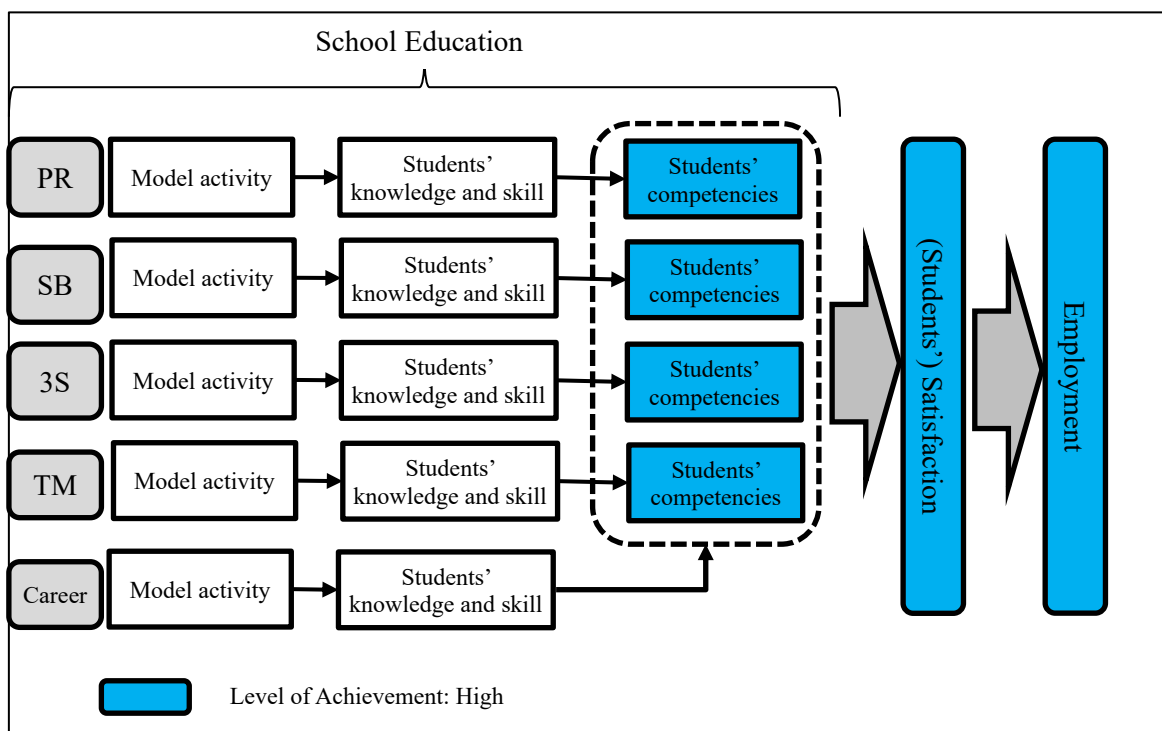
<sup>6</sup> Among four Pilot Schools, the rate of School T was lower (average of all departments: 75% in the practical lessons) as the rate at newly added departments was lower. As described in section 3.1.4 (3), time management of students at the newly added departments was significantly improved from the baseline regardless of the short periods of input, but the PDM target was not achieved.

Narrative Summary	OVI	Achievement Level	Reason
Output 2: Students acquire basic hard skills and soft skills through introducing improved practical lessons at pilot schools	2-1. The rate of students' products graded as "Good": 30%	High	The average of each department was 59% in the endline survey (achievement rate: 197%).
	2-2. The rate of students properly wearing clothes according to the safety standard of the practical lessons: 95%	High	The average of each department was 97% in the endline survey (achievement rate: 102%).
	2-3. The rate of tools and materials properly restored after use at the end of the practical lessons: 95%	High	The average of each department was 100% in the endline survey (achievement rate: 105%).
Output 3: Local companies and pilot schools are cooperating with each other.	3-1.1. (Dual system) collaborative activities implemented with local private companies: 4 activities per year	Relatively high	The number of activities in the 2019/2020 school year was four, and the indicator was achieved.  However, at the time of the endline survey in the 2020/2021 school year, only one activity had been conducted (achievement rate: 25%), which was an underachievement due to the COVID-19 outbreak.  The activities were resumed actively in the 2021/2022 school year again.
	3-1.2. (Conventional system) collaborative activities implemented with local private companies: 6 activities per year	Relatively high	The number of activities in the 2019/2020 school year was six and the indicator was achieved.  However, at the time of the endline survey in the 2020/2021 school year, only one and half activities had been conducted (achievement rate: 25%), which was underachieved due to the COVID-19 outbreak.  The activities were resumed actively in the 2021/2022 school year again.
	3-1-3. The rate of graduates' placement records: 50%	High	In the endline survey for graduates of the 2021/2022 school year, information was collected from 68% of the graduates (achievement rate: 136%).
Output 4: A new model school that introduces Japanese style technical education is in operation.	4-1. The rate of teachers starting lessons on time: 90%	High	100% (achievement rate: 111%) in both practical lessons and theoretical lessons were achieved in the endline survey.
	4-2. The rate of students rightly seated at the starting time of lessons: 90%	High	100% (achievement rate: 111%) in both practical lessons and theoretical lessons were achieved in the endline survey.
	4-3. The rate of students' products graded as "Good": 30%	High	The average of each department was 81% in the endline survey (achievement rate: 270%).
	4-4. The rate of students properly wearing clothes according to the safety standard of the practical lessons: 90%	High	The average of 100% for each department was achieved in the endline survey (achievement rate: 111%).

Narrative Summary	OVI	Achievement Level	Reason
	4-5. The rate of tools and materials properly restored after use at the end of the practical lessons: 95%	High	The average of 100% for each department was achieved in the endline survey (achievement rate: 105%).
	4-6. Collaborative activities implemented with local private companies: 4 activities per year	Moderately high	<p>The number of activities in the 2019/2020 school year was three (achievement rate: 75%).</p> <p>However, at the time of the endline survey in the 2020/2021 school year, only one activity had been conducted (achievement rate: 25%), which was an underachievement due to the COVID-19 outbreak.</p> <p>The activities were resumed actively in the 2021/2022 school year again.</p>
	4-7. The rate of career development information of the students: 50%	High	50% (achievement rate: 100%) for the 2021/2022 school year.
	4-8. Training programs conducted based on the guidelines for teaching and management level staff: 5 programs per year	Relatively high	<p>Several training programs were conducted every school year as described below.</p> <p>2018/2019: Five internal training programs (achievement rate: 100%)</p> <p>2019/2020: One internal Guideline training and one skills training for mechanical department teachers of School O (achievement rate: 40%)</p> <p>2020/2021: Two webinars for disseminating result to other schools and two skills training programs for mechanical and electricity department teachers of School ES (achievement rate: 80%)</p>

Source: JPT

Figure 4-1 shows the PDM achievement status on the model.



Source: JPT

**Figure 4-1 The Model with Achievement Level**

The level of achievement of all students' competencies in PR, SB, 3S, and TM was high on the PDM. The level of achievement for students' satisfaction and employment were also judged as high. From this achievement and Chapter 3, the following points can be concluded.

**(1) Improvement of Students' Competencies by Activities That Referred to Japanese-style Technical Education.**

In target schools that introduced the model activities referring to Japanese-style technical education in five areas (PR, SB, 3S, TM, career), students' competency in four areas (PR, SB, 3S, TM) achieved a high level from the PDM perspective. In comparison to the baseline result, significant improvements were observed in all areas.

The findings of each area are as below.

- PR (Production according to Request): The level of students' products improved in all departments of Pilot Schools and New Model Schools. In particular, the improvement in the level of students' products was more significant in the departments newly designated as pilot departments during the extension period, where the interval between inputs and evaluation was shorter.
- SB (Safe Behavior): The improvement in Pilot Schools was significant, with a 46-percentage point improvement between the baseline and endline.
- 3S (Sort/Set in order/Shine): Pilot Schools had achieved 100% in the baseline survey as the pre-pilot activities were conducted before the Project started. However, students' recognition of 3S, which was low in the baseline survey, was improved, and it was inferred that students understood 3S rules and performed them.



- Time Management (TM): Significant improvements were observed compared to the baseline. In particular, students' punctuality in the practical lessons improved by 52 percentage points over the baseline, reaching 87%.

Thus, it was confirmed that the model activities referring to the Japanese-style technical education can greatly contribute to the improvement of students' competencies.

## **(2) Students' Competencies and Satisfactions**

Comparing Pilot Schools with New Model Schools, New Model Schools have a better implementation of activities and higher values of students' knowledge and skills. As a result, when comparing students' competencies and students' satisfaction, New Model Schools showed better results in all categories. For example, in the rate of teachers starting lessons on time, i.e., being a TM role model, Pilot Schools achieved 93% in the practical lessons and 99% in the theoretical lessons, while New Model Schools achieved 100% in both. Pilot Schools achieved the target of the PDM indicators. However, it was observed that New Model Schools went above and beyond and provided an excellent education.

## **(3) Improvement of Satisfaction and Employment by Improved School Education**

As shown in (1) above, the introduction of the model activities has improved students' competencies, and the achievement level of students' satisfaction and employment from the PDM perspective is high. However, large "variations" were observed for employment. In both the dual system and conventional system, the rate of graduates who sought jobs, thereafter, that have obtained them was low among the graduates in June 2020 while the rate was high among the graduates in June 2021. This suggests that companies that refrained from hiring in the early stages of the COVID-19 outbreak returned to hiring in 2021, suggesting that the influence of local economic conditions is significant. On the other hand, the three partner companies of the Project are hiring graduates of the target schools and are satisfied with the performance of the graduates, indicating that the improvement in school education is leading to the improvement in employment.

# **Appendix A: Questions and Points for Assessment Except PR**

**(1) Questionnaire for Student**

Number	Question	Answer		
		a	b	c
1	Do you know what the school will do if you are late or absent?	Yes, I know.	No, I do not know.	I do not care what will happen.
2	Does the practical lesson start within 2 minutes of the time in the timetable?	Yes, always.	Sometimes it starts after 2 minutes.	I do not know even if it starts on time or not.
3	How are you instructed on safety for practical lessons mainly?	Teachers instructed on safety before and/or during practical lessons repeatedly.	Teachers instructed on safety before and/or during practical lessons sometimes.	I studied about safety using a textbook in the classroom.
4	Is there a dress code in your school workshop?	Yes, there is.	No, there isn't.	I do not know if there is.
5	When do you first know what you practice in a practical lesson?	At the lesson.	A few days before the lesson.	At the beginning of the semester.
6	Do you know the 3S rules in your school workshop?	Yes, I know.	No, I don't know.	I do not know what 3S means.
7	How often do you use tools in practical lessons?	Every lesson.	Half of the lessons.	I don't use them.
8	What will you do after you use a tool?	Return it to where it was.	Return it to a teacher.	Leave it where I used it.
9	How do you usually get to know how to practice before each topic in a practical lesson?	By teachers' demonstration at the lesson.	By teachers' verbal instruction at the lesson without demonstration	By reading a textbook or signboard.
10	Do you understand the contents of the practical lessons easily?	Yes.	Sometimes it's difficult.	No, it's difficult to understand.
11	Do you think that you gained skills in the practical lessons?	Yes.	Sometimes.	No.
12	Do you think that the skills you gained in the practical lessons will be useful in the future?	Yes.	Perhaps, yes.	No.
13	Which do you like the best in your school life?	Practical lessons of technical subjects.	Theoretical lessons of technical subjects.	Non-technical subjects.
14	What do you want to do after graduation?	Further study.	Work or work/study.	Other things.
15	Do you know where you can get career development information in your school?	Yes, I know.	No, I don't know.	I'm not interested.

**(2) Visual Confirmation or Interviews with Teachers**

Area	Target	Question
TM	Target Schools	Do you have time management rules in this school (for example, regarding the timetable, how the school deals with students who violate time management rules)?
	Target Schools	Do you have any documents regarding time management rules?
	Target Schools	Do you have a 5-minute break between each class?
	Target Schools	Do you have a school bell system?
	Target Schools	Do you have a wall clock in each classroom and workshop?
	Target Schools	Do you have a timetable in each classroom and workshop?
	Target Schools	If you have any other system of time management, please describe it.
SB/ 3S	Target Schools	Do you check and record students' tardiness at each practical lesson and each class to verify the effectiveness of your instruction?
	Target Schools	Do you have safety rules inside the workshop?
	Target Schools	Do you have any documents or posters for safety rules?
	Target Schools	Do you check and record if students follow safety rules to verify the effectiveness of your instruction?
	Target Schools	Do you have 3S or 5S rules posted in the workshop?
	Target Schools	Do you have any documents or posters for 3S or 5S rules?
	Target Schools	Do you check and record if students follow 3S rules to verify the effectiveness of your instruction?
	Target Schools	Do you have a rule to return their tools and equipment to the original place after use?
	Target Schools	Do you have any documents or posters for the rule of returning tools and equipment?
Career	Pilot Schools	What is the percentages of graduates among whom the school has the record of their placement one year after their graduation?
	New Model Schools	What is the percentage of students for whom the new model school keeps records of their career development information (such as department, ID number, name, address, contact numbers, and target companies/colleges, etc.)?
	Target Schools	How much recruitment information from local industries is on the record in the school?
	Target Schools	Has the school implemented collaborative activities with local companies since the previous academic year (factory training including dual and semi-dual training, internship programs, study visits, career advice by graduates such as graduate advisory sessions, company briefings for the students at school etc.)?
Others	New Model Schools	Did you have in-school training programs based on the Guideline for teaching and management level staff after the Guideline training by the project? Please describe the details of training such as topics of training, implementation dates, trainers, and trainees, etc.

**(3) Lesson Observation Instruction by JPT**

Area of Measurement		Method of Assessment
Theoretical Lesson	TM	Count the number of students and teachers who come to class on time.
Practical Lesson	TM	Count the number of students and teachers who come to class on time.
	SB	Count the number of students who wear a working uniform that meets the safety criteria
	3S	Count the number of tools and equipment that are <b>NOT</b> restored after practical lessons (check if those remained on the table of the workshop).

**(4) Telephone Interview Questions with Graduates or their Parents**

The school telephone list for those graduated last year was used for the survey. The survey team called the graduates or their parents along with the teachers. The information requests and questions asked of the graduates or their parents were as follows:

- i) Teachers in target schools called those who graduated recently or their parents and briefed them on the survey.
- ii) The surveyors asked a) their future plans during their school days and b) their current status, by selecting from among the choices below.
  - Study
  - Work
  - Work and study
  - Marriage
  - Doing nothing (for only current status)

**(5) Interview with Partner Companies**

Q1. Did your company hire graduates who graduated from the following school(s) in the following year?

If the answer to Q1 is b) No, please answer Q2 only

Q2. Is there any reason your company did not hire?

Q3. How many graduates did you hire who graduated in 2021 (or 2020, 2019)?

Q4. Are you satisfied with their work?

Q5. Please explain in detail why you chose the answer in Q4.

# **Appendix B: Assessment for PR**

The Project assessed products for PR. Assessing students' products are prioritized, but teachers' products were assessed for the decoration department of School T, as there were no students' products stored.

The products vary from department to department, and from year to year. Therefore, either the Japanese experts or local trainers defined the assessment items of the products and the score of each item and scored the product on a scale of 100 points.

The project categorized the products into three levels, A (good), B (acceptable), and C (not acceptable), according to the following scores.

- A: 80 points or more
- B: 60 points or more and less than 80 points
- C: Less than 60 points

Level A corresponds to "Good" on the PDM.

The items of assessment of each department are shown below.

### **(1) Electronics Department of Schools A, P, and T**

The products for the national final practical examination in 2017, 2018, 2019 and 2021 were used. The two items as follows are assessed by either the Japanese expert or the local trainer:

- I. The correct circuit board was scored 20 points maximum. – According to the specification, the students assemble the correct parts, and set them in printed circuit boards.
- II. The high quality of soldering skills scored 80 points maximum. – Each part of the soldering items was assessed and classified as Good, Fair, or Poor, and calculated by the following formula: (% of Good) x80 + (% of Fair) x 40.

The maximum of the total score of parts I and II is 100 points.

### **(2) Electricity and Computer Department of School T**

The products for the national final practical examination of the electronics department in 2017 were used for baseline data and the products developed by Grade 2 students in November 2021 during the supplementary class were used for the endline data.

The same assessment items as in the electronics department above were used.

### (3) Mechanical Maintenance for School O

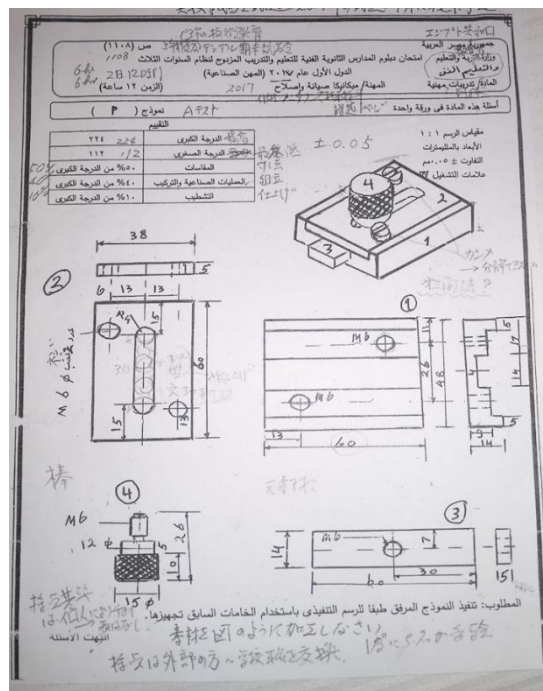
The products for the national final practical examination in 2017, 2018, 2019, and 2021 were used. The products differ greatly from year to year, so they are shown below for each year.

#### 2017 and 2019

The following 13 items were assessed on a basis of 100 points.

I. For each part of the product ①-③ in the figure at right, the specification of length is shown. The expert measured the length and calculated the difference between the product and the standard (Std.). He defined the error range and gave a mark of “1” if the difference was within the error range. Otherwise a score of no points, “0,” was given. He checked the seven items, so the maximum score is seven. The standard and error ranges are shown in the table below:

Part	No.	Std.	Error
①	l	60.00	0.05
	a	48.00	0.05
	b	14.00	0.05
	c	38.00	0.50
②	d	60.00	0.05
	e	14.00	0.05
	f	5.00	0.05
③	g	26.00	0.50
	h	12.00	0.50



- II. Knurling: He observed it and classified into Good or Poor and gave one point for Good.
- III. Slide: He checked the smoothness of the slide. If it was smooth enough, he gave one point.
- IV. Space between ① and ②: He observed and gave one point if the space was appropriate.
- V. Level difference between ①/②: He observed and gave one point if the gap was appropriate.

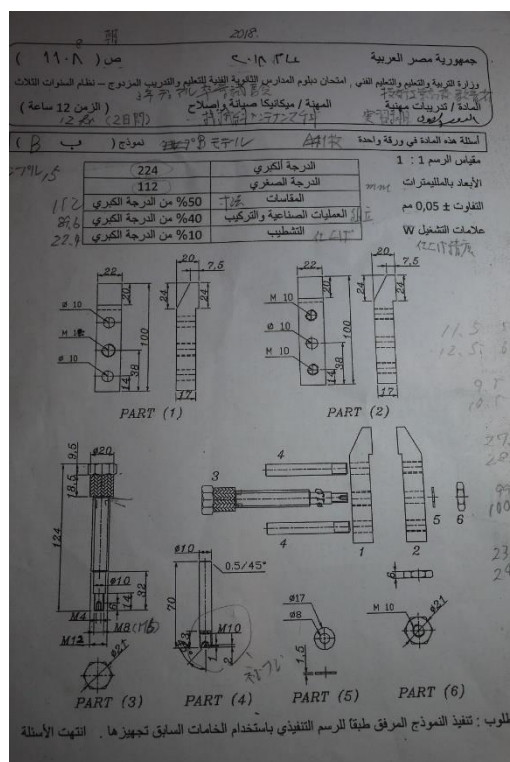


2018

The following 14 items were assessed on a basis of 100 points.

- I. For each part of the product ①-③ in the figure at right, the specification of length is shown. The expert measured the length and calculated the difference between the product and the standard (Std.). He defined the error range and marked "1" if the difference was within the error range. Otherwise, a score of no points, "0," was given He checked the 10 items, so the maximum score was seven. The standard and error ranges are shown in the table below:

Part	Std.	Error
③	12.00	0.50
	6.00	0.50
	10.00	0.50
	28.00	0.50
	100	0.50
①	24	0.50
	17	0.50
	100	0.50
②	24	0.50
	17	0.50

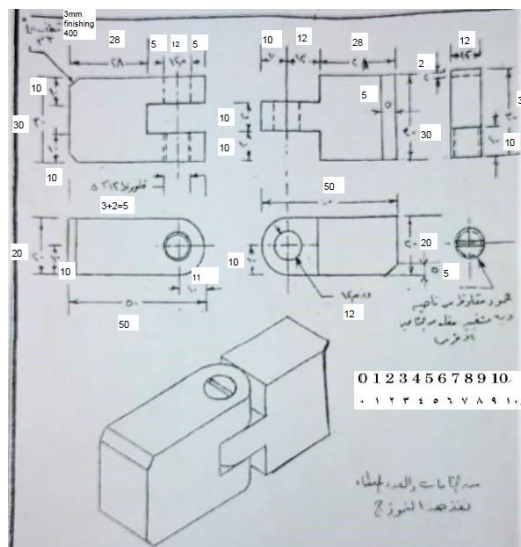


- VI. Function: He checked if it can be assembled. If it could be, one point was given.
- VII. Knurling: He observed it and classified into Good or Poor and gave one point for Good.
- VIII. Screw thread condition: He observed and gave one point if the thread cutting was appropriate.
- IX. Finish: He observed and gave one point if the surface was smooth.

2021

The following 13 items were assessed and converted into 100 points.

- I. For each part of the product ①-③ in the figure at right, the specification of length is shown. The expert measured the length and calculated the difference between the product and the standard (Std.). He defined the error range and gave a mark of “1” if the difference was within the error range; otherwise, no score, “0,” was given. He checked the 12 points, so the maximum score was seven. The standard and error ranges are shown in the table below:



Item			Std.	Error
Left	Dimension	A	50	0.1
		B	30	0.1
		C	20	0.1
	Concave portion	Width	10	0.1
		Deep	22.5	0.1
	Hole	From the edge	5	0.1
diameter		12	0.1	
Right	Dimension	A	50	0.1
		B	30	0.1
		C	20	0.1
	Salient	Width	10	0.1
		Deep	22	0.1

- II. Function: He checked if it could be assembled smoothly.

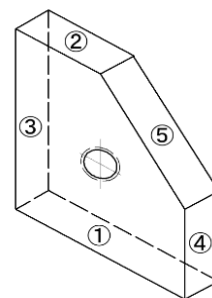
**(4) Mechanical for School EA**

School EA, which opened in September 2018, had no students’ products for the national final practical examination. Therefore, the expert assessed the hand-finished product created by Grade 1 students. The product differs from year to year, so they are shown below for each year.

2018 and 2019

The 10 items were assessed as shown in the table below.

Item	Assessment Standard
Dimension ①－②	Std 50.0 Error $\pm 0.1$ , (G: not greater than Error)
Dimension ③－④	Std 50.0 Error $\pm 0.1$
Squareness ①－③	G: not greater than 0.1, F: 0.1~0.2, B: not less than 0.3
Squareness ②－④	G: not greater than 0.1, F: 0.1~0.2, B: not less than 0.3
Flatness ①	G: not greater than 0.1, F: 0.1~0.2, B: not less than 0.3
Flatness ②	G: not greater than 0.1, F: 0.1~0.2, B: not less than 0.3
Surface R ①	G: not greater than 1.6, F: 1.6~2.5, B: not less than 2.5
Surface R ②	G: not greater than 1.6, F: 1.6~2.5, B: not less than 2.5
Surface R ③	G: not greater than 1.6, F: 1.6~2.5, B: not less than 2.5
Dimension Accuracy ③	G: No step, F: Slight step, B: Huge steps

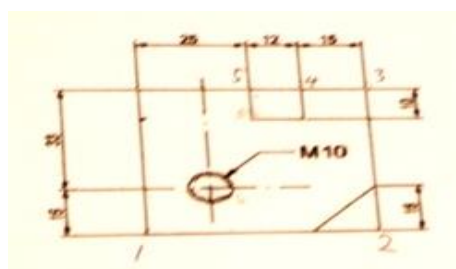


A deduction method was adopted for scoring. First, 100 points were given. Each item was assessed, and if the result was G (good), there was no deduction. If the result was F (fair), 10 points were deducted, and if B (bad), 20 points were deducted. This was done for all 10 items.

2020

The four items are assessed as shown in the table below.

Items	Std.	Error
Dimension 1-2	52	0.2
Dimension 2-3	48	0.2
Dimension 3-4	15	0.2
Dimension 5-1	12	0.2

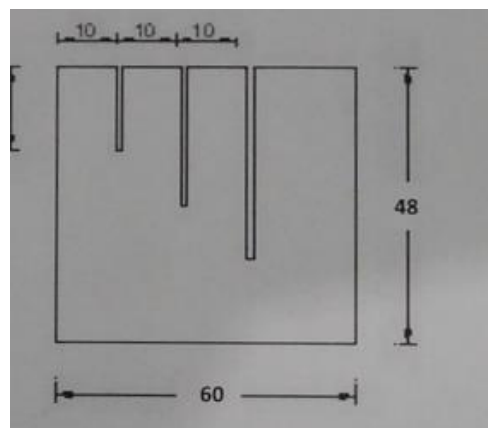


Pass or Fail was decided on each item. If the dimension was within the range of error, the expert gave Pass to the item. The grade was decided by the number of passes: A for more than three passes, B for two passes, and C for less.

2021

The five items are assessed shown in the below.

- I. Dimension Std. 60 Error  $\pm 0.2$ ,
- II. Dimension Std. 48 Error  $\pm 0.2$
- III. Squareness (any two parts)
- IV. Finish: He observed and gave one point if the surface was smooth.



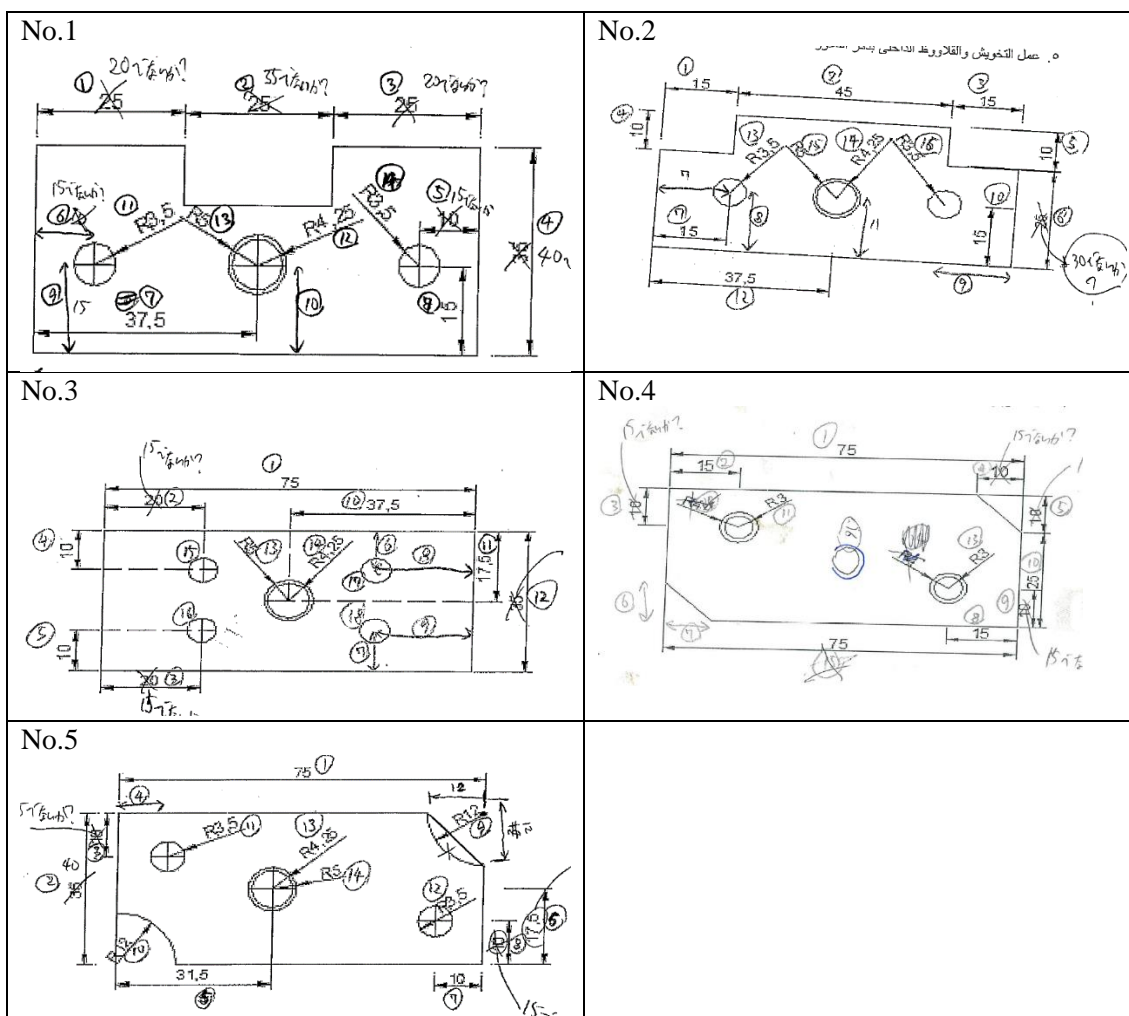
**(5) Mechanical for School ES**

School EA, which joined in 2021, had no students' products for the national final practical examination. Therefore, the expert assessed the hand-finished products created by Grade 1 students.

Baseline

The expert evaluated the 2020 students' products for the baseline. The students were divided into five groups, and each group created a different product: No. 1 to No. 5. The table shows the points, Std., and margin of error for each evaluation. The percentage of points within the error was converted on a scale of 100 points.

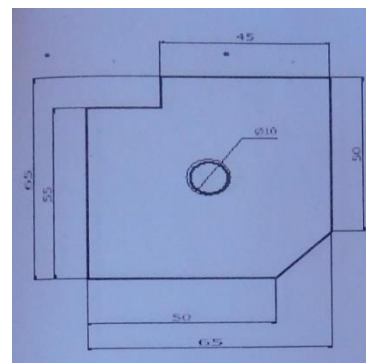
		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
No. 1	Std.	20	35	20	40	15	15	37.5	15	15	15		
	Error	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4		
No. 2	Std.	15	45	15	10	10	30	15	15	15	15	15	37.5
	Error	0.4	0.5	0.4	0.4	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.5
No. 3	Std.	75	15	15	10	10	10	10	15	15	37.5	17.5	40
	Error	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
No. 4	Std.	75	15	15	15	15	15	15	15	15	25		
	Error	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5		
No. 5	Std.	75	40	15	10	31.5	20	15	15	12	12	12	
	Error	0.5	0.5	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	



Endline

The seven points are assessed shown in the below.

- I. Dimension Std. 65 Error  $\pm 0.3$
- II. Dimension Std. 65 Error  $\pm 0.3$
- III. Dimension Std. 8 Error  $\pm 0.3$
- IV. Dimension Std. 20 Error  $\pm 0.3$
- V. Dimension Std. 10 Error  $\pm 0.3$
- VI. Dimension Std. 50 Error  $\pm 0.3$
- VII. Dimension Std. 50 Error  $\pm 0.3$



**(6) Electricity for School ES**

The same assessment items and standard were used for the baseline survey and the endline survey. There are five assessment items in total. A total of 100 points were allocated to each assessment item.

No.	Assessment Item	Full Mark	Assessment Standard
1	Selection of correct parts	10	<ul style="list-style-type: none"> <li>• Good: if students correctly selected components / equipment such as junction boxes, switches, switch boxes, pipes and connectors from right parts, the alternative parts, and the wrong parts</li> <li>• Fair: if students selected alternative parts</li> <li>• Fail: If students selected wrong one</li> </ul>
2	Installing parts in the correct position	10	<ul style="list-style-type: none"> <li>• Good: The parts and equipment were installed at the correct positions specified in the circuit diagram</li> <li>• Fail: If students installed wrong</li> </ul>
3	Appropriate wire length	20	<ul style="list-style-type: none"> <li>• Good: The wire is not too short (not pulled at the connection points at both ends) and not too long.</li> <li>• Fair: There are some problems, but it works as a product.</li> <li>• Fail: There is a problem, and it does not work as a product.</li> </ul>
4	Appropriateness of terminal processing	30	<ul style="list-style-type: none"> <li>• Good: Correct terminal treatment is applied (exposed conductor from coating, protruding copper wire, insulation treatment (taping), etc.).</li> <li>• Fair: There is some problem with the terminal treatment, but it works as a product.</li> <li>• Fail: There is a problem with the terminal treatment, and it does not work as a product.</li> </ul>
5	Proper connection of parts and wiring materials	30	<ul style="list-style-type: none"> <li>• Good: Good connection is applied (screw tightened, insert copper wire of appropriate length).</li> <li>• Fair: There are some problems with the connection, but it works as a product.</li> <li>• Fail: There is a problem with the connection, and it does not work as a product.</li> </ul>

Multiple parts were evaluated for each assessment point. For example, if 10 parts were assessed at assessment point 1, each part was given one point to make the full mark of assessment point 1. If all were Good, it was calculated to be 10 points. Fair is half the score of Good.

### (7) Decoration for School T

At the time of the baseline survey conducted in July 2021, there were no students' products created in the past. Therefore, the expert asked trainees (teachers) to develop Arabic calligraphy before the skill training implementation as the baseline data. After the skills training, the expert asked the trainees (teachers) to develop the same topic for assessment. A sample of Arabic calligraphy after the skills training is shown right.



The following 13 points are assessed and converted into 100 points.

Point	Steps	Instructions
Measurement	Enlarging the drawing	Drawing auxiliary lines
	Length	30 cm
	Width	19 cm
	Division of the rectangle	Each 1-cm length and 1-cm width
Coloration	1-Selection of the colors appropriate for the design	
	2-Accurate coloration, and carefully selected colors	
	3-Blending the colors well and keeping the color bright	
	4-Coloring the Mistrik with well lined	
The Mistrik	1-Drawing 0.5 cm Mistrik to keep the design balanced	
	2-Coloring the Mistrik with appropriate color and determining the colors well	
General appearance	1-Coloring the background with color appropriate for the design	
	2-Adding an Islamic drawing appropriate for the design	
	3-Maintaining the general appearance and taking into consideration innovation in finishing the design	

### (8) RMG for School T

No students' products made with the same pattern was found at time of the baseline survey. Also, the students could not complete their work by the endline survey in November 2021. Therefore, the expert evaluated only the evaluable parts of the students' products for both the baseline and the endline products.

The assessment points that were used slightly differed depending on the product, but the score of each product was converted so that it could be assessed on a scale of 100 points. The next table shows the assessment points with marks allocated. All products were evaluated in terms of assessment point a), b) and c). A total of 50 points were given to d) and e). These 50 points were given according to the number of points that can be evaluated.

No	Assessment Point		Standard	Mark	
A1	a) Finishing		No stains or scratches on the product.	5	
A2			Has been ironed.	5	
A3			The basting thread has been removed.	5	
A4			The disposition of thread ends has cleaned up.	5	
B1	b) Cutting		Cut with the right grain line.	4	
B2			The notches are correct.	2	
B3			The fusible interfacing is correctly pasted / not pasted in the inappropriate place	4	
C1	Sewing	c) Base of the sewing	Stitch	The stitch balancing thread tension is correct.	5
C2			Backstitching	The straight hand stitching is correct.	5
C3				The backstitching is done.	5
C4				The thread on the back of the backstitching is not entangled.	2.5
C5				The width of backstitching is correct.	2.5
D1	d) Finishing of the seam allowance	Overlock	The straight hand stitching and width of the overlock are correct.	50	
D2			The stitch of overlock has not fallen.		
D3			The finishing of overlock is correct.		
E1	e) Sewing/ Partition	Part of the seam	Sewn with a uniform seam allowance.	50	
E2			The direction of the seam allowance is correct.		
E3			The sewn edges of the fabric are not misaligned.		
E4			The iron is working well.		
E5			The seam allowance at the hem is uniform.		
E6		The hem stitch width is sewn evenly.			
E7		The hem stitch has not fallen.			
E8		The seam allowance at the hem is not tacky.			
E9		There is no twist on the hem.			
E10		The iron is working well.			
		Hem/Cuff			