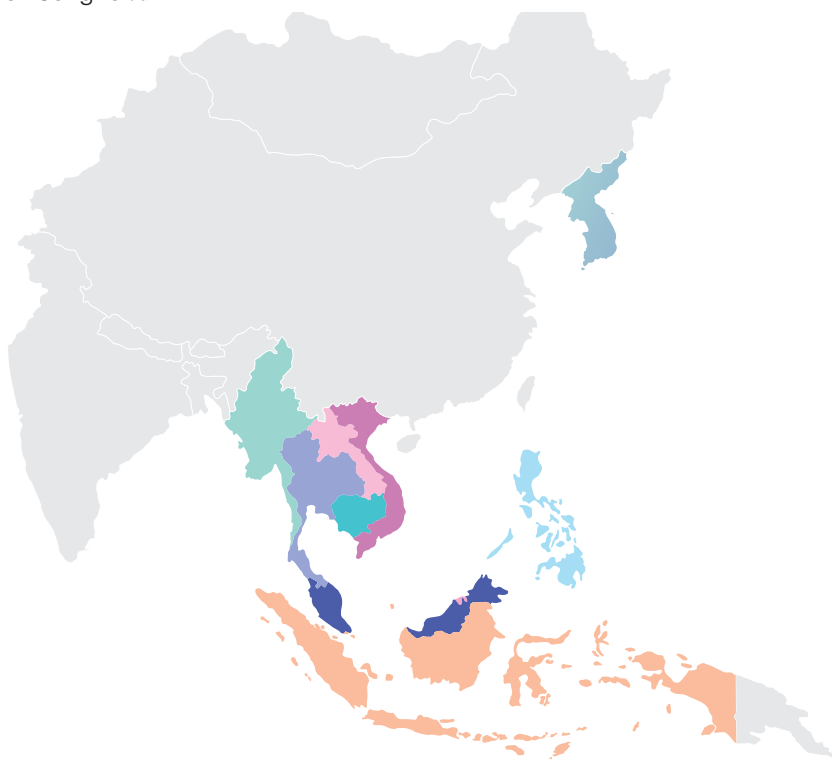


NRC

2022 Korea-Indonesia Cooperation for Making Indonesia 4.0 :

A Study on the Introduction of ICT-based Practice
Enterprise in Indonesia I

Project Manager Jeon Jongho KRIVET



경제·인문사회연구회
NATIONAL RESEARCH COUNCIL FOR
ECONOMICS, HUMANITIES AND SOCIAL SCIENCES



한국직업능력연구원
Korea Research Institute for Vocational Education & Training

This Report was written by the Authors as the final output of the Research Project awarded by and submitted to the National Research Council for Economics, Humanities, and Social Sciences (NRC) of Korea.

Copyright © 2022 by National Research Council for Economics, Humanities, and Social Sciences
Sejong National Research Complex(A), 370 Sicheong-daero, Sejong-si, 30147, Korea

Tel: 82-044-211-1180~85 / Website: www.nrc.re.kr

* Copying or reprinting of part or all of the contents of the report without the permission of NRC is prohibited.

Authors

KOREA

Jeon, Jong-Ho: Research Fellow (Principal Researcher), KRIVET

Kim Sang Jin: Senior Research Fellow, KRIVET

Lee Sang Don: Senior Research Fellow, KRIVET

Yu, Jinyoung: Associated Research Fellow, KRIVET

Lee, Young-min: Honorary Research Fellow, KRIVET

Kim, MinJung: CEO, KoreaPEN

Lee, Sang-Won: Researcher, KRIVET

INDONESIA

Mufidah: Ministry of Industry, Indonesia

Pak Gunawan: Ministry of Industry, Indonesia

Ninda Meisfandari Salsabila: Ministry of Industry, Indonesia

Idi Amin: Ministry of Industry, Indonesia

Abstract

In the era of the Fourth Industrial Revolution, digital transformation has become an essential means for enterprises to enhance their business competitiveness. As part of efforts to strengthen the national competitive edge, each government establishes and promotes a wide range of national-level policies to support corporate digital transformation. The Indonesian government has also devised the Making Indonesia 4.0 (MI 4.0) initiative as a way to elevate the nation's competitiveness through the implementation of Industry 4.0. In order ensure the continuation of the outcomes achieved by MI 4.0, it is vital to develop the competencies of human resources in priority industry sectors. To this end, significant emphasis is placed on the importance of technical and vocational education and training (TVET).

The traditional model of face-to-face work and TVET has become difficult to maintain since 2020 due to the COVID-19 pandemic. Under these circumstances, online, non-face-to-face communication has witnessed its importance and necessity escalating more than ever. This new online, non-face-to-face work and TVET environment further requires the ability to utilize digital technology and collaboration skills.

This study reflected this demand of the times and presented findings on the usage of digital competency-based work experience PEs, which can be utilized to improve trainees' employability and entrepreneurship in Indonesia. This includes detailed operation methods that can be applied to secondary TVET institutions, higher TVET institutions and companies.

Based on the 2022 study results, a roadmap was suggested for a pilot project scheduled to be implemented from 2023 to 2024. This two-year pilot project will allow Indonesia to build its competency to independently operate digital competency-based work experience PEs. In addition, this study proposed the organization and operation of the Practice Enterprise Network in Asia (Asia PEN) as part of the global network of PEN Worldwide under the leadership of South Korea and Indonesia. This is expected to result in the vitalization of work experience through international exchanges between Practice Enterprises in various Asian countries.

Keywords: Practice Enterprise, Digital Competency, Work Experience

Policy Recommendations

- 1) Establish a policy of adopting a model of digital competency-based work experience PEs that is suitable for secondary TVET institutions in Indonesia across a wide range of education courses such as formal curricula and special programs. TVET tailored to the needs of companies will induce positive effects such as promoting an understanding of business, expanding the potential for career path exploration in consideration of personal aptitude, and improving employability and entrepreneurship after graduation.
- 2) Establish a policy of adopting a model of digital competency-based work experience PEs that is suitable for higher TVET institutions (polytechnics) in Indonesia across a wide range of education courses such as formal curricula (especially necessary for business-tailored departments) and special programs. TVET tailored to the needs of companies will induce positive effects such as promoting an understanding of business, expanding the potential for career path exploration in consideration of personal aptitude, and improving employability and entrepreneurship after graduation.
- 3) Design a policy project to deliver a model of digital competency-based work experience PEs to aid adult job seekers. This policy project will focus on companies in various sectors such as automobile, bio, chemical and textile industries (with the participation of relevant agencies serving diverse roles in the form of a consortium) with the aim to assist them in not only recruiting outstanding personnel but also meeting the national and social needs for nurturing human resources.
- 4) Form a “priority industry consultative committee” (tentatively named) of key industry players in Indonesia with the aim to continue the effects of MI 4.0 such as the development of industries and competencies of participating human resources. One of the committee’s functions will be to support the linkage and operation of digital competency-based work experience PEs.
- 5) Support policy-making efforts to assist the operation of Asia PEN, a network of practice enterprises in Asia, in order to develop international competencies by building up a network between practice enterprises in South Korea and other Asian countries including Indonesia.

Contents

Chapter 1. Introduction.....	1
1.1. Background and Objectives of the Study.....	1
1.1.1. Current Status of Indonesia's Economy	1
1.1.2. Indonesia's Fourth Industrial Revolution (Making Indonesia 4.0)	1
1.1.3. Emphasis on Human Resource Development for Successful Indonesia's Making Indonesia 4.0	2
1.1.4. Objectives of the Study.....	3
1.2. Implementation Framework and Methods of the Study	5
1.2.1. Implementation Framework of the Study	5
1.2.2. Main Details and Implementation Methods of the Study	5
1) Main Details of the Study	5
2) Implementation Methods of the Study	6
 Chapter 2. Status of Work Experience Education in Indonesia	 9
2.1. General Information on TVET in Indonesia.....	9
2.2. Status of Work Experience Education under the Ministry of Industry in Indonesia.....	13
2.2.1. Status of TVET Institutions	13
1) General Information.....	13
2) Graduate Trends.....	15
2.2.2. Cases of Work Experience Education	18
1) Teaching Factory	18
2) Business Incubator	20

Chapter 3. Status of Work Experience Education in Korea..... 23

3.1 General Information on TVET in Korea 23

3.2. Status of Work Experience Education under the Ministry of Education in Korea 26

3.2.1. Work Experience Education in Secondary Vocational Education.....26

1) On-the-job Training26

2) On-the-job Training as Parallel Work-and-learn System in Specialized High Schools.....28

3.2.2. Work Experience Education in Higher Vocational Education.....30

1) Legal Basis, Concepts, and Types of Work Experience Education in Higher Vocational Education30

2) Operational Status and Improvement Plans for Work Experience Education in Higher Vocational Education34

Chapter 4. Practice Enterprises and Digital Competency..... 43

4.1. Overview of Practice Enterprises..... 43

4.1.1. Experiential Learning and Situated Learning43

4.1.2. Understanding of Practice Enterprises43

4.2. Operating Cases of Practice Enterprises..... 45

4.2.1. Summary of Case Analysis45

4.2.2. Individual Operating Cases by Main Affiliated Institution46

1) Main Affiliated Institutions (Secondary Schools)47

2) Main Affiliated Institutions (HEIs)57

3) Main Affiliated Institutions (Companies)68

4.3. Digital Competency and Practice Enterprises 77

4.3.1. Digital Competencies to Be Applied to PEs77

4.3.2. Status of ICT Utilization in PEs81

Chapter 5. Utilization Plan for Digital Competency-based Work Experience PEs in Indonesia.....	85
5.1. Utilization Plan.....	85
5.1.1. Overview of Proposal	85
5.1.2. Detailed Proposal.....	86
1) Operational Organization	86
2) Operation Procedure	88
3) Operating Programs.....	88
4) Operating Infrastructure	92
5) Education Evaluation	92
6) Considerations	93
5.2. Pilot Operations Roadmap	95
5.2.1. Pilot Operations for 2023	95
5.2.2. Pilot Operations for 2024	95
Abbreviation.....	977
References.....	99

Chapter 1. Introduction

1.1. Background and Objectives of the Study

1.1.1. Current Status of Indonesia's Economy

Indonesia's economy posted a negative growth rate of -2.1 percent in 2020 under the influence of the COVID-19 pandemic, but modest growth has been sustained since the 2000s with the growth rate returning to an upward trend in 2021.

By industry, service industries showed the highest growth rate, except for the exceptional case of 2020, followed by the mining and manufacturing industries, while the agriculture, forestry, and fishing sectors registered relatively lower growth rates.

<Table 1-1> Trends of Growth Rates in Indonesia by Sector

(Unit:%)

	2000	2005	2010	2015	2020	2021
GDP	4.9	5.7	6.2	4.9	-2.1	3.7
Agriculture, Forestry, Fishing (Agriculture)	1.9	2.7	3.0	3.8	1.8	1.8
Mining and Manufacturing (Industry)	5.9	4.7	4.9	3.0	-2.8	3.4
Services	5.2	7.9	8.4	5.5	-1.5	3.6

Source: Asian Development Bank (ADB), Key Indicators for Asia and the Pacific 2022, <https://kidb.adb.org>

1.1.2. Indonesia's Fourth Industrial Revolution (Making Indonesia 4.0)

In the era of the Fourth Industrial Revolution, Indonesia established the “Making Indonesia 4.0 (MI 4.0)” initiative in 2018 with the aim to develop the country into one of the ten largest economies in the world by 2030.

To achieve this goal, Indonesia selected five sectors as focus industries (food and beverages,

textiles and apparel, automobiles, electronics and chemicals) and created growth strategies.

When industries grow as planned, Indonesia's economy is prospected to achieve GDP growth, create employment, and increase the ratio of manufacturing to GDP.

- Economic growth rate: A growth rate will increase from 5 to 6-7 percent.
- Employment: 20-30 million new jobs will be created by 2030.
- The ratio of manufacturing to GDP: The ratio will be expanded from 16 to 20 percent.

1.1.3. Emphasis on Human Resource Development for Successful Indonesia's Making Indonesia 4.0

To achieve the goal of Making Indonesia 4.0 involves an emphasis on human resource development (HRD) and technical and vocational education and training (TVET) (Nos. 1, 3, and 6).

<Figure 1-1> Scope of Programs and Activities Under PIDI 4.0 Cooperation



Source: Excerpt from presentations in the Korea-Indonesia mid-term review and workshop (August 26, 2022)

The COVID-19 pandemic induced significant changes such as the expansion of non-face-to-face and remote work. In the post-COVID-19 era, the demand for non-face-to-face and remote work is prospected to continue.

- In order to ensure the stable provision of education and business operation, non-face-to-face models of education and work are expected to continue in parallel to existing face-to-face methods.
- The TVET sector must also prepare for such social changes. Unlike in Korea, vocational high schools in Indonesia have more schools and students than general high schools. As such, since a large portion of manpower focuses on seeking employment after graduation, it is important to prepare for non-face-to-face vocational education.

※ Schools (vocational : general = 14,301 : 13,939), students (vocational : general = 5,249,149 : 4,976,127) / as of 2019-2020

1.1.4. Objectives of the Study

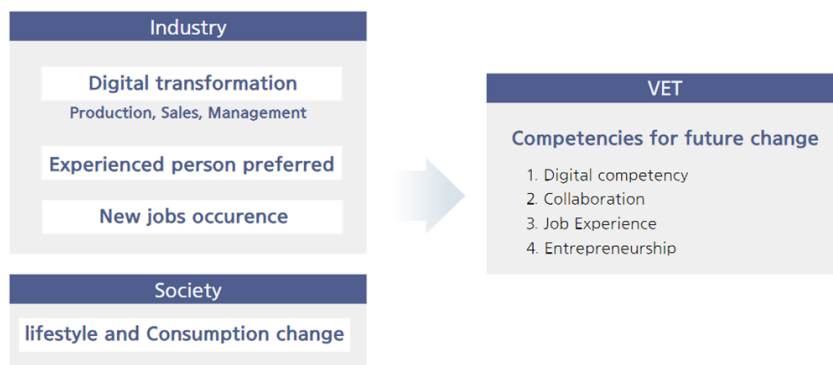
The study aims to share Korea's experiences regarding the operation of digital competency-based work experience PEs.

- A practice enterprise (PE)* is operated as a trial program for managing a pilot company to reduce employees' retraining costs after joining a company, adapt to the organizational culture, and nurture human resources who can adeptly cooperate and communicate.

※ The concept of practice enterprises originated from 19th-century Germany and the first practice bureau was established in 1920. As of 2022, approximately 7,000 PEs are in operation in around 40 countries worldwide.

- The PE programs currently in operation in Korea are continually shifting to non-face-to-face modes (using online systems) due to COVID-19, and operating models are becoming more diversified in areas such as secondary TVET institutions, universities, and vocational training.
- As Korea recognizes artificial intelligence and software as core technologies that are required to lead social and industrial changes in line with the Fourth Industrial Revolution, it has conducted various TVET studies to develop digital competency and identify digital competencies that are applicable to the TVET sector.
- The implementation of studies on how various non-face-to-face PEs have been operated at home and abroad and studies on previous research with regard to the comprehensive organization and improvement of digital competency is expected to support nurture human resources to lead industrial innovation in Indonesia as well as Korea, and strengthen mutual cooperation with Korea in the TVET sector.

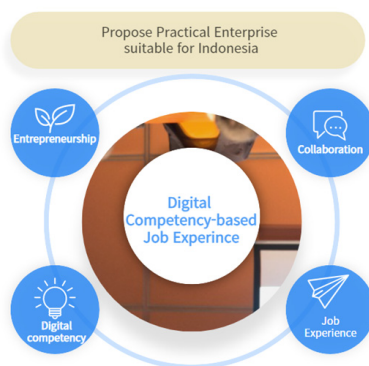
<Figure 1-2> Background of the Study – Changes in Society and Jobs



This study is designed to propose “an initiative on the utilization of digital competency-based work experience PEs” that is suitable for Indonesia, with the aim to achieve MI 4.0 and subsequently provide consultation for the implementation of pilot programs.

- (1) (2022) Propose an initiative on utilization of digital competency-based work experience PEs for Indonesia.
- (2) (2023) Implement a pilot programs for digital competency-based work experience PEs for Indonesia (led by Korea).
- (3) (2024) Implement a pilot programs for digital competency-based work experience PEs for Indonesia (led by Indonesia).

<Figure 1-3> Study Objectives



1.2. Implementation Framework and Methods of the Study

1.2.1. Implementation Framework of the Study

This study is conducted under the collaboration of Korea (National Research Council for Economics, Humanities and Social Sciences (NRC) and Korea Research Institute for Vocational Education & Training (KRIVET)) and the Ministry of Industry of Indonesia.

This study is conducted through the mutual exchange of opinions and research data cooperation between researchers from KRIVET and Indonesia.

Since the start of the study in mid-April 2022, the collaboration between researchers has been conducted via email and other online methods.

Meetings were held between researchers from both countries through the mid-August workshop and the final presentation in November.

In addition, the nature of the task allows the PE personnel from the two countries to participate in and collaborate on research.

1.2.2. Main Details and Implementation Methods of the Study

1) Main Details of the Study

Current status of work experience education and training and PEs in Indonesia

- Current status of work experience education and training offered by TVET institutions (vocational high schools, polytechnics, and TVET institutions)
- Current status of work experience education and training in public and private institutions
- Current status of PE operation in Indonesia
- Analysis of implications in consideration of human resources development, digital competency, non-face-to-face channels, suitable for five strategic industries in preparation for MI 4.0

Current status of work experience education and training and PEs in Korea

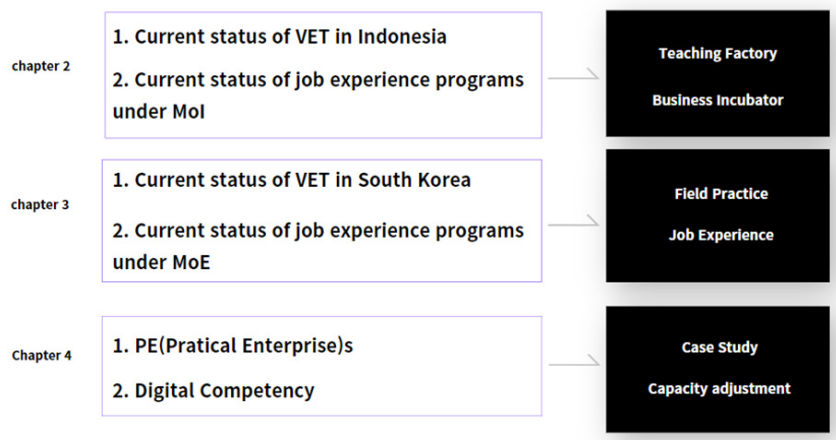
- Analysis of Korea's systems and policies for work experience education and training
- Arrangement of related data to improve the understanding of PEs and case studies of operating PEs at home and abroad

- Case studies of ICT-based PEs in Korea
- Reviews of measures to apply digital competency to ICT-based PE programs
- Analysis of implications; arrangement of implications conducive to applying Korea's experiences of operating PEs to Indonesia

Plan for utilizing digital competency-based work experience PEs

- Proposals of plans (draft) to utilize digital competency-based work experience PEs
 - Major operating institutions: vocational high schools, polytechnics, and companies
 - Operation methods (certificates of completion, licenses, etc.), operation programs, etc.
- Proposal for the roadmaps for second and third year (2023-2024) of the pilot project

<Figure 1-4> Main Details of the Study (Contents of the Report)



2) Implementation Methods of the Study

Investigation and analysis of data

- Data collection on the current status of work experience education and training and PEs in Indonesia

- Data collection on the current status of work experience education and training and PEs in Korea
- Data collection of overseas cases related to the operation of PEs
- In-depth interview with relevant personnel for the analysis of limitations and needs for improvements in the operation of PEs in Korea

Literature review

- Literature review on experiential learning, PEs, and digital competency
- Literature review on Indonesia's economy, education, TVET, etc.

Expert consultation

- Exploration of major issues and challenges as well as improvement plans in the work experience education and training and the operation of PEs in Korea
- Expert consultation on digital competency and ICT utilization
- Consultation for Indonesia on the formulation of plans to utilize digital competency-based work experience PEs

Collaboration with Indonesian government departments

- Composition of a research team and the preparation of manuscripts in consultation with the Indonesian Ministry of Industry and related ministries
- Promotion of practical communication and collaboration through conferences and workshops held by the Korea-Indonesia joint research group

On-site investigation and sharing of business outcomes through mutual visits

- Literature reviews and interviews with pertinent officials in relevant agencies, and on-site inspections to verify investigation results gathered by Indonesian personnel
- Joint research workshops and talks
- Sharing research outcomes through presentations

Chapter 2. Status of Work Experience Education in Indonesia

2.1. General Information on TVET in Indonesia

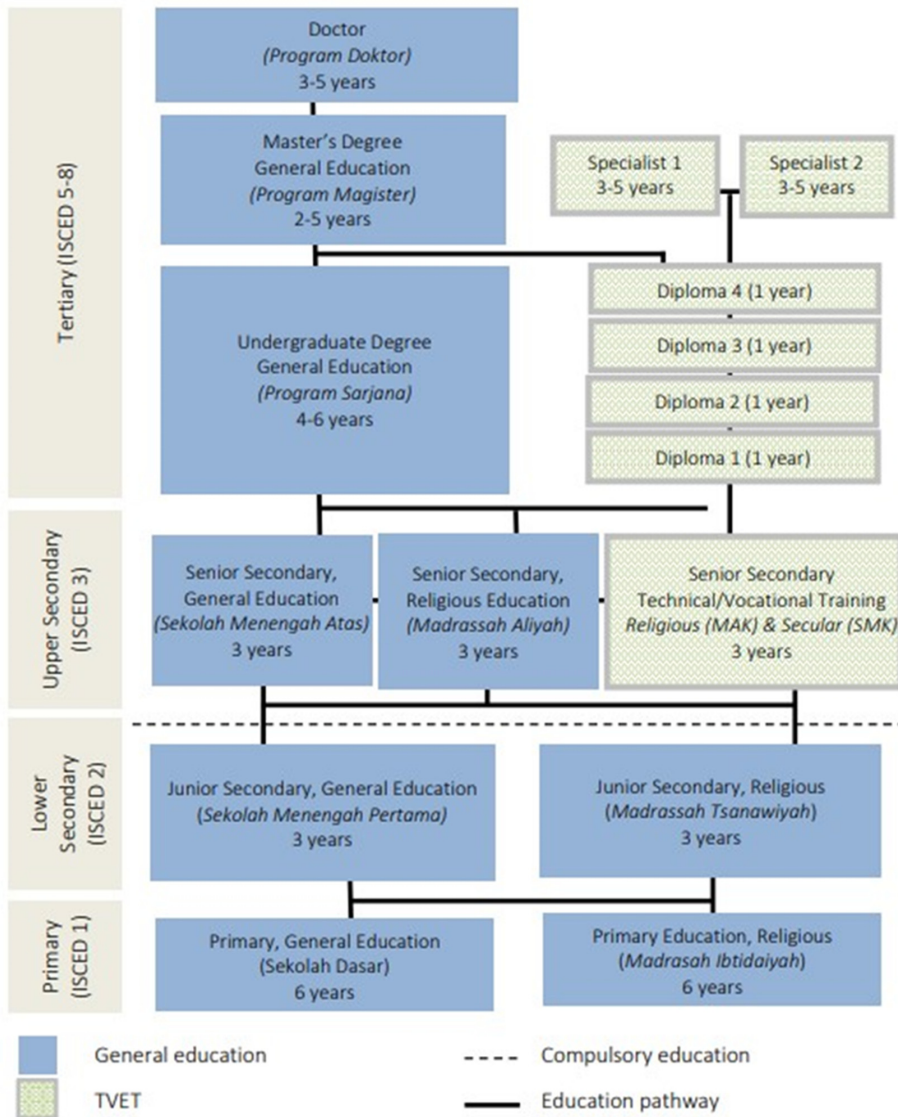
From an overview of Indonesia's formal education and training system, its six-year primary education curriculum is provided at Level 1 of the International Standard Classification of Education (ISCED) in two types of schools: primary general education (SD) schools and primary religious education (MI) schools. At ISCED Level 2, there are two types of three-year courses: junior-secondary general education (SMP) and junior-secondary religious education (MT).

For higher secondary education, corresponding to ISCED Level 3, the three-year education course is classified into two tracks: one for general education and the other for TVET. The general education schools are further classified into general education (SMA) and religious education (MA) high schools. TVET institutions are also classified into religious high schools (MAK) and secular high schools (SMK).

At tertiary education, corresponding to ISCED Levels 5-8, there are general universities and graduate schools that provide general education such as undergraduate degree courses of four to six years, master's degree courses of two to five years, and doctoral courses of three to five years. For TVET, polytechnics provide Diploma 1-4 courses (one year for each course), equivalent to the undergraduate degree level of general education, and three-to-five-year specialist courses, which are equivalent to master's degree courses.

In addition, open avenues are provided for students to transfer freely between general education and TVET within the formal education system.

<Figure 2-1> Formal Education and Training System in Indonesia



Source: UNESCO-UNEVOC (2020). *TVET Country Profile: Indonesia*, p.5

According to UNESCO's *TVET Country Profile: Indonesia* (2020), there were 14,064 vocational high schools (SMK) as of the 2018-2019 school year, consisting of 3,578 public schools and 10,486 private schools.

In addition, in terms of higher TVET institutions, there were 172 polytechnics, and in terms of non-formal TVET institutions, there were 279 vocational centers (BLK) and 1,034 private academies run by private companies.

<Table 2-1> Type of TVET Institutions in Indonesia

Type of Institution	Education Level	Competent Agency	Number of Institutions
Vocational Secondary Schools (SMK) (public/private)	Higher secondary	Ministry of Education and Culture, etc.	14,064 (3,578/10,486)
Polytechnics	Tertiary		172
Vocational centers (BLK)		Ministry of Manpower and Transmigration, etc.	279
Private academies	Tertiary		1,034

Source: UNESCO (2019). *TVET Country Profile: Indonesia*, p.4

In Indonesia, a range of ministries are responsible for TVET. However, the most prominent ones include the Ministry of Education and Culture (MoEC), the Ministry of Research Technology and Higher Education (MoRTHE) for vocational education, and the Ministry of Manpower and Transmigration (MoMT) for vocational training.

The Ministry of Education and Culture is responsible for educational services at primary and secondary levels. It carries out its functions of vocational education through the Directorate of Technical and Vocational Education (DTVE). The Ministry of Research Technology and Higher Education is responsible for general high education as well as vocational education at the tertiary level, i.e. polytechnics. The Ministry of Manpower and Transmigration is responsible for national training centers (BLK) as a non-formal TVET provider that prepares citizens, especially school leavers, for the employment sector. In addition to the above-mentioned two ministries, there are the Ministry of Industries (MoI), Ministry of Transportation (MoT), Ministry of Maritime Affairs and Fisheries (MoMF), Ministry of Agriculture (MoA), and Ministry of Health (MoH), which establish and operate TVET institutions and vocational centers under the auspices of each ministry within the scope of their given duties and functions.

While educational planning is established at the central government level, its implementation falls under the jurisdiction of local governments in accordance with the decentralization strategy of the Indonesian government. In addition, the following authorities are exclusively tasked with the quality control of TVET institutions at each level as a way to supervise accreditation and competence certifications issued by each institution:

- National Accreditation Board for School/Madrasah (BAN-SM) under the MoEC for accreditation in vocational high schools;
- National Accreditation Board for Higher Education (BAN-PT) under the MoRTHE for polytechnics, colleges and university accreditations;
- Accreditation Board for Training Centers (LA-LSPK) under the MoMT for BLKs; and
- National Professional Certification Board (BNSP) for issuing competence certificates.

Like other educational services, public TVET financing is also stipulated by the Law on National

Education as a joint responsibility between the MoEC, which provides 20 percent of the national budget to finance education services, and other education stakeholders, such as local governments (20 percent of regional budget contribution) and communities. Meanwhile, private TVET institutions (SMK) are independently financed.

Funding depends on the type of ownership (individual, faith-based, non-governmental organization (NGO), and partnership) and requires operational authorization from government ministries. Private schools may charge students tuition fees to operate.

2.2. Status of Work Experience Education under the Ministry of Industry in Indonesia

2.2.1. Status of TVET Institutions

1) General Information

TVET delivered by the Ministry of Industry of Indonesia falls under the jurisdiction of the Agency for Industrial Human Resource Development (AIHRD) under the Ministry of Industry.

The Ministry of Industry has various TVET institutions under its auspices, specifically 9 vocational high schools, 11 polytechnics, 2 industrial community colleges, and 7 vocational centers across the country. Among them, the first three are formal TVET institutions, while vocational centers are non-formal.

<Figure 2-2> Status of TVET Institutions under the Ministry of Industry of Indonesia



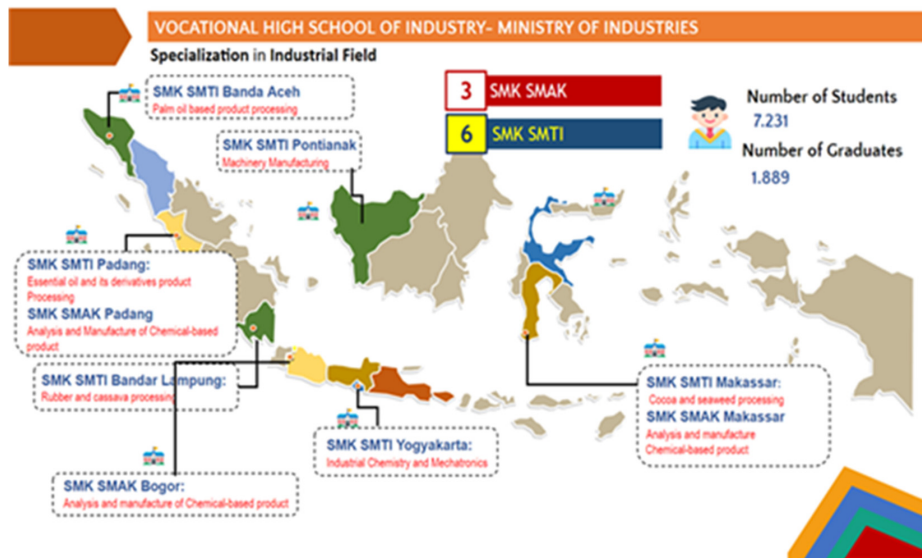
Source: Internal materials of the Ministry of Industry of Indonesia

Vocational high schools under the Ministry of Industry consist of three vocational high schools of chemical analysis (SMAK) and six vocational high schools of industrial technology (SMTI).

Each high school provides TVET specializing in an industry field to reflect the characteristics of local industries, as shown in the figure below. It aims to improve related aptitudes in students in order for graduates to effectively adapt to the local industry environment in which they are likely to work after graduation. Most of their curricula operate based on the Indonesian National Work

Competency Standards (SKKNI). As of 2021, there were 7,231 students and 1,889 graduates at these vocational high schools.

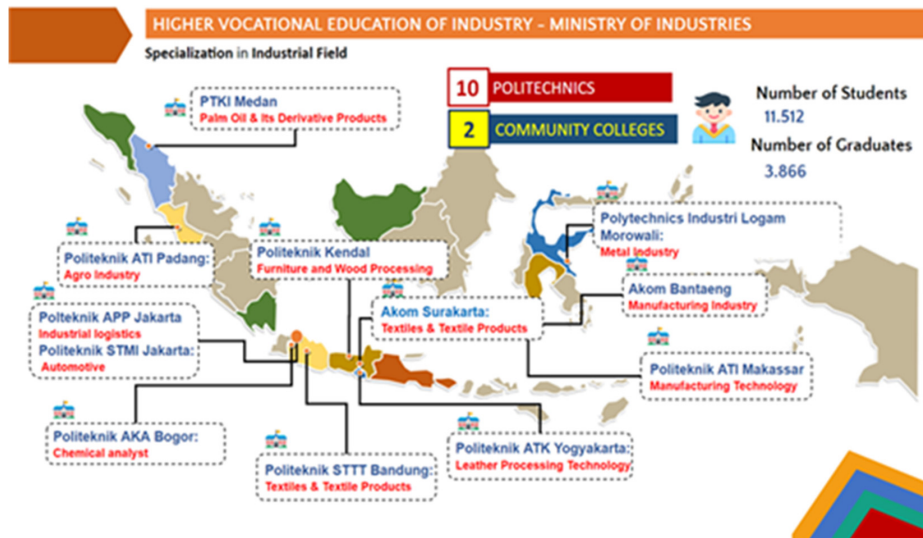
<Figure 2-3> Status of Vocational High Schools under the Ministry of Industry of Indonesia



Source: Internal materials of the Ministry of Industry of Indonesia

The higher TVET institutions under the Ministry of Industry consist of ten polytechnics that operate Level 3 and 4 diploma courses, and two community colleges that operate Level 2 diploma courses. These institutions mostly operate curricula specialized for local industries and include practice rooms, laboratories and workshops equipped with machinery and equipment in line with industry standards. As of 2021, there were 11,512 students and 3,866 graduates at these higher TVET institutions.

<Figure 2-4> Status of Higher TVET Institutions under the Ministry of Industry of Indonesia



Source: Internal materials of the Ministry of Industry of Indonesia

The seven vocational centers under the auspices of the Ministry of Industry are aimed at dropout students who do not enroll in formal TVET, as well as general workers and the unemployed.

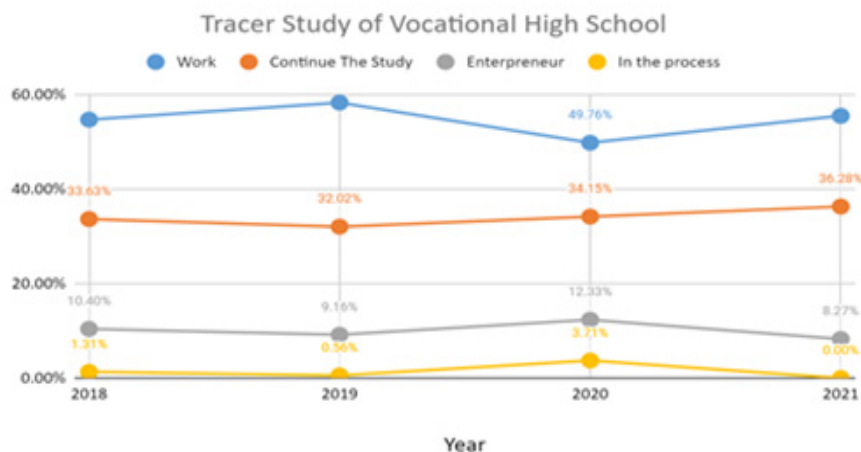
The training courses are operated in a competency-centered 3-in-1 training system based on the SKKNI, together with a business incubation program as part of entrepreneurship education. Vocational centers are fully equipped with practice rooms, manufacturing facilities and dormitories for trainees.

2) Graduate Trends

According to the survey results of the AIHRD, the trends among graduates of TVET institutions under the Ministry of Industry between 2018 and 2021 are shown as follows.

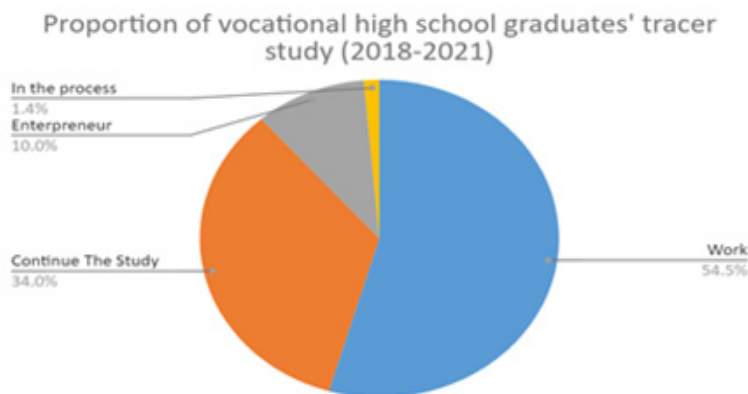
For vocational high schools under the Ministry of Industry, the industry employment rate of graduates averaged 54 percent from 2018 to 2021. Although the employment rate declined due to the emergence of the COVID-19 pandemic in 2020, it entered into an upward trend of gradual recovery in 2021. In addition, the average rates of college entrance and new entrepreneurs stood at 34 percent and 10 percent, respectively. Since students in vocational high schools have a higher desire for entrance to higher education institutions, their industry employment rate is relatively lower than that of graduates of higher TVET institutions.

<Figure 2-5> Graduate Trends of Vocational High Schools under the Ministry of Industry (by year)



Source: Internal materials of the Ministry of Industry of Indonesia

<Figure 2-6> Graduate Trends of Vocational High Schools under the Ministry of Industry (average)

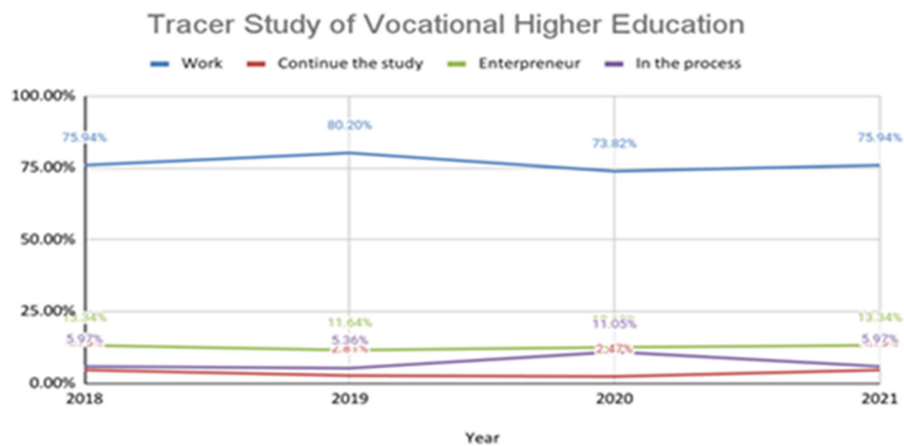


Source: Internal materials of the Ministry of Industry of Indonesia

Examining the trends of graduates from higher TVET institutions under the Ministry of Industry, the industry employment rate averaged 76.5 percent from 2018 to 2021, while the rate of new entrepreneurs stood at 12.7 percent and the enrollment rate was 3.7 percent for the same period. The employment rate and the rate of new entrepreneurs appeared relatively high, which is attributable to the fact that graduates were at the suitable working age without much competition

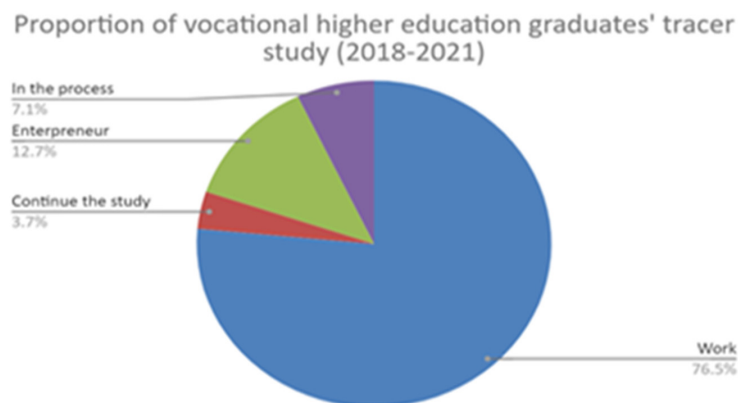
in the job market. This was also affected by the higher degree of understanding and satisfaction with regard to the education provided, as businesses were directly involved in the entire process of education such as curriculum organization, establishment of education facilities and equipment, and student selection, in collaboration with higher TVET institutions under the Ministry of industry.

<Figure 2-7> Graduate Trends of Higher TVET Institutions under the Ministry of Industry (by year)



Source: Internal materials of the Ministry of Industry of Indonesia

<Figure 2-8> Graduate Trends of Higher TVET Institutions under the Ministry of Industry (average)



Source: Internal materials of the Ministry of Industry of Indonesia

2.2.2. Cases of Work Experience Education

The current status of work experience education delivered by TVET institutions under the Ministry of Industry, examined with a particular focus on the cases of two higher TVET institutions, namely Bandung STTT Polytechnic and Makassar ATI Polytechnic, is as follows.

Bandung STTT Polytechnic and Makassar ATI Polytechnic are located in Java and Sulawesi, respectively, the two main islands of Indonesia. They are responsible for fostering experts in the textile industry and advanced agricultural machinery industry, respectively, reflecting characteristics of local industries. These polytechnics operate in their respective regions while spreading their experience and knowledge to other polytechnics in adjacent regions.

Work experience education in polytechnics includes programs such as Teaching Factory and Business Incubator, which are operated as a dual system in collaboration with the industry field. The case study on the types of work experience education in the two schools is comprehensively presented as follows.

1) Teaching Factory

The Teaching Factory is a program designed to allow students to manufacture products at an on-campus factory under faculty guidance after receiving production orders from external customers. This allows students to experience and acquire the knowledge and skills required in the real-world industry field.

The Teaching Factory is part of a curriculum that guides students to navigate a problem-solving process by engaging them in the real-life challenges of the relevant industry. As opposed to simply generating profits from the production process, it also aims to develop students' ability to directly respond to consumer needs.

The Teaching Factory at Bandung STTT Polytechnic, which specializes in the textile industry, has workshops and equipment related to textile and apparel production, ranging from yarn and textile manufacturing and textile chemical processing to pattern making, cutting, sewing and quality testing. The factory produces various textile products such as fabric, clothes, suits and scarves.

The Teaching Factory is closely related to on-the-job training. For example, when receiving an order to make clothes, students participate in the process of making clothes such as pattern making, cutting and sewing during the practice classes.

The budget for the operation of Teaching Factory is financed basically by revenues generated from consumer orders and partially relies on the support system for polytechnics.

The Teaching Factory at Makassar ATI Polytechnic applies the following three production methods based on each stage of the production process, depending on the purpose of production.

- The following figure presents the process of advancing the production method in stages.

The diagram illustrates the TeFA model, showing the progression from internal needs to mass business products through seven phases. The model is structured as a staircase with seven steps, each representing a phase. The phases are labeled on the left, and the corresponding outcomes are listed on the right. The outcomes are categorized into three main groups: **Kreatifitas** (Creativity), **Efisiensi** (Efficiency), and **Kualitas** (Quality). The final outcome is **Inkubator Bisnis / Produk massal** (Business Incubator / Mass Product).

Phase	Input / Requirement	Outcome
Fase 1 dan 2 (Pra TeFA)	Hasil untuk kebutuhan Internal Job sheet untuk mencapai kompetensi Jadwal blok	Kualitas
Fase 3 (Quality level)	Job Order	Kualitas
Fase 4 (Efficiency level)	Project work - Problem solving	Efisiensi
Fase 5 (Creativity level)	Project work - Inovation	Kreatifitas
Fase 6 (Innovation level)		Kreatifitas
Fase 7 (Development level)		Kreatifitas
		Inkubator Bisnis / Produk massal

19

2) Business Incubator

The Business Incubator at polytechnics provides business opportunities and support for related applied technology research in order for students, who are referred to as tenants in the incubator, to evolve into new entrepreneurs or start-ups.

The Business Incubator also serves as a venue of public discussion where SME founders and prospective entrepreneurs can practice, ask questions, discuss and address management problems individually or in groups in order to start and grow their business.

The Business Incubator at STTT Polytechnic is a one-year course titled the Fashion and Textile Business Incubator (INFAST).

INFAST's major activities include coaching, mentoring, and business development in the fashion and textile sector. As a business clinic, various forms of support are provided for marketing, financing, product development and Industry 4.0. It also runs annual programs in a wide range of areas such as education, co-working spaces, shared offices, mentoring, seminars, exhibitions and promotions.

The Business Incubator at Makassar ATI Polytechnic is a three-year course titled the Industrial Technology Business Incubator (IBTI).

The IBTI provides various services for small enterprises such as a development center, an innovation center, consulting and education programs. Its business incubation process takes place through the following phases:

- 1. Pre-incubation: The phase for selecting prospective tenants. Prospective tenants submit an official proposal for a product prototype that they intend to make at the IBTI. When meeting the basic administrative requirements, they are selected as the first round of successful applicants and then provided the opportunity to give a presentation in front of IBTI reviewers before being finally selected as a participant in the business incubation program.
- 2. Early step: The initial mentoring phase. Education and training services are provided for the IBTI's formal tenants in the fields of technology and management, business law, business plan, and production trials.
- 3. Development step: The middle-tier mentoring phase for business development. At this stage, the IBTI provides support for initial production, market trials, intellectual property rights, product certification, and standardization.
- 4. Advanced step: The final mentoring phase for business development. At this stage, the IBTI provides its formal tenants support for commercial production, market expansion, and network development.
- 5. Post-incubation: The phase where tenants develop into innovative, independent and competitive SMEs. The IBTI supports the development of national and international business networks.

<Figure 2-10> Business Incubation Process of IBTI Makassar ATI Polytechnic



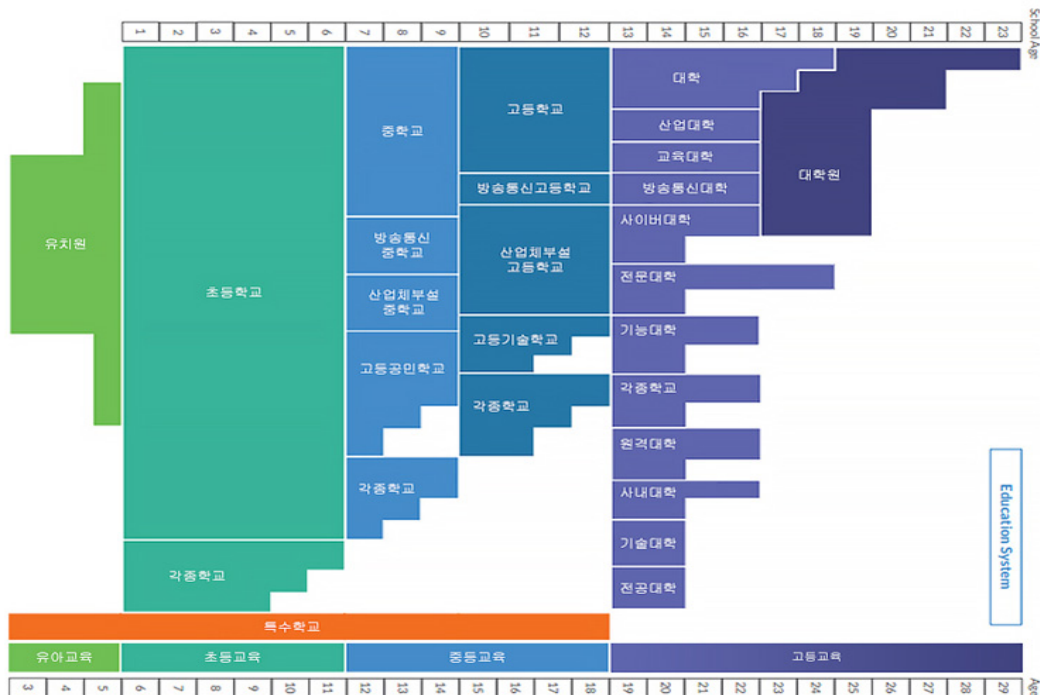
Source: Prepared by the research team

Chapter 3. Status of Work Experience Education in Korea

3.1 General Information on TVET in Korea

Korea's formal education and training system consists of six years of elementary school, three years of middle school which offers lower secondary education, and three years of high school which offers upper secondary education. While elementary and lower secondary education is compulsory and free, high school education is free but not compulsory (see Figure 3-1).

<Figure 3-1> Formal Education and Training System in Korea



Source: Korea Academic Recognition Information Center,
<https://www.karic.kr/com/cmm/EgovContentView.do?menuNo=9110101000>. Accessed on October 19, 2022

Elementary, middle, and high schools in Korea are divided into national, public, and private schools based on the founding entity. High schools consist of general high schools, special-purpose high schools, specialized high schools, and autonomous high schools. Specialized high

schools are dedicated to offering secondary vocational education (source: Korea Academic Recognition Information Center).

Higher education institutions in Korea are divided into universities, industrial universities, universities of education, junior colleges, distance universities, technical colleges, and various other institutions. Generally, it takes two to three years to obtain a junior college diploma, four to six years for a bachelor's degree, two years or more for a master's degree, and two years or more for a doctorate degree. Junior colleges and technical colleges are mainly dedicated to higher vocational education (source: Korea Academic Recognition Information Center).

According to the data published by the Korean Educational Development Institute in 2022 (see Figure 3-2), a total of 581 secondary TVET institutions were in operation, including 467 specialized high schools (267 public, 200 private), 46 Meister high schools (5 national, 36 public, 5 private), and vocational classes in 68 general high schools (37 public, 31 private) as of April 2021.

<Figure 3-2> Status of Secondary TVET in Korea

학교유형별 설립별 졸업 후 현황

(단위: 개교, 명, %)

2018
입학기준

	학교수	졸업자	취업자 (취업률%)	진학자 (진학률%)	입대자	제외인정자	미취업자			
특성화고	국립	-	-	-	-	-	-			
	공립	267	35,201	9,016	51.7	16,446	46.7	735	572	8,432
	사립	200	34,462	9,428	55.2	16,601	48.2	560	213	7,660
마이스터고	국립	5	1,069	540	57.3	45	4.2	81	1	402
	공립	36	3,889	2,594	79.3	313	8.0	281	24	677
	사립	5	777	495	79.1	19	2.4	130	2	131
일반고 직업반	국립	-	-	-	-	-	-	-	-	-
	공립	37	1,935	279	36.0	1,110	57.4	13	36	497
	사립	31	1,661	231	35.9	995	59.9	9	14	412
전체	국립	5	1,069	540	57.3	45	4.2	81	1	402
	공립	340	41,025	11,889	55.3	17,869	43.6	1,029	632	9,606
	사립	236	36,900	10,154	55.3	17,615	47.7	699	229	8,203
합계	581	78,994	22,583	55.4	35,529	45.0	1,809	862	18,211	

주) 1. 조사기준일 : 2021년 4월 1일 2. 학교수 : 2018학년도 입학생 없는 5개교 포함(특성화고 4개교, 일반고 직업반 1개교)
3. 졸업자 : 2021년 1월 및 2월 졸업자 (졸업자에 수료자2명 포함됨) 4. 진학률(%) : (진학자/졸업자)×100

Source: Korean Educational Development Institute (2022), *Guidelines and Its Summary (Brochure) of Vocational High School Graduate Employment Statistics Survey*, <https://guess.kedi.re.kr/board/guidebook.do>

The average employment rate of secondary TVET institution graduates is 55.4 percent. The average employment rate of Meister high school graduates is higher than that of specialized high schools and vocational classes in general high schools.

There are a total of 143 higher TVET institutions, including nine technical colleges and 134 junior colleges, and the number of technical college students is 23,910, and junior college students 576,041, as shown in the table below.

<Table 3-1> Status of Higher TVET Institutions in Korea

Category	Number of Institutions	Number of Students
Technical college	9	23,910
Junior college	134	576,041

Source: Korean Educational Statistics Service of Korean Educational Development Institute, <https://school.kedi.re.kr/index.do>. Accessed on October 19, 2022

Most TVET institutions in Korea are governed by the Ministry of Education. Secondary and higher TVET institutions are supervised by the relevant government ministries, and in this case, the ministries in charge provide budget support separately from the Ministry of Education. However, the Ministry of Education is in charge of conferring diplomas to graduates.

3.2. Status of Work Experience Education under the Ministry of Education in Korea

3.2.1. Work Experience Education in Secondary Vocational Education

Work experience education in secondary vocational education is provided in the form of on-the-job training, which consists of school activities and extracurricular activities.

It is also provided through industry-academia vocational apprenticeship schools. Students attend these schools for two to three days a week to cultivate theoretical and vocational skills, and nurture practical work capacity through on-the-job training at partnering companies under contract for another two to three days a week.

1) On-the-job Training

(1) Overview of On-the-job Training

On-the-job training refers to a form of education that is provided in the actual workplace where normal work takes place. This form of training is characterized by the ability to gain on-site experience and operating as a part of the school curriculum with approval from the schools and guidance and supervision from teachers (KRIVET, 1999).

On-the-job training is defined as an “education and training course in which specialized high school and Meister high school students are dispatched to companies to cultivate practical job skills with the aim to find employment” (Ministry of Employment and Labor, KRIVET, 2012).

On-the-job training is defined as “courses conducted in the vocational site from which vocational educatees and trainees may acquire knowledge, technology and attitude necessary for employment and performance of duties concerning his or her future careers” (Vocational Education And Training Promotion Act).

On-the-job training refers to “applying knowledge and skills acquired at school and gaining experience, with the aim to enhance various work experiences and on-site adaptability” (Ministry of Education, 2018b).

On-the-job training is a part of the curriculum that enhances various work experiences and on-site adaptability by applying knowledge and skills acquired at school to companies and gaining experience (Ministry of Education, KRIVET, and Korea Student Aid Foundation, 2021).

(2) Types of On-the-job Training

The types of on-the-job training are divided into school activities and extracurricular activities. School activities for on-the-job training are mainly carried out through expert lectures, start-up club activities, specialized subjects, etc. for first- to third-year students.

Extracurricular activities are conducted through on-the-job training in partnership with outstanding educational institutions, placement-based on-the-job training, and employment contract-based on-the-job training. Employment contract-based on-the-job training is offered to third-year students, while the others are open to first- to third-year students.

Details are presented in the “Types of On-the-job Training in the 2015 Revised National Curriculum” in Table 3-2.

<Table 3-2> Types of On-the-job Training in the 2015 Revised National Curriculum

Category	Detailed Activities	Target Grade
School activities	· Start-up club activities, specialized subjects, expert lectures, etc.	Grade 1-3
Extracurricular activities	· On-the-job training in partnership with outstanding educational institutions (shared training facilities, polytechnics, Human Resources Development Division of Korea Chamber of Commerce and Industry, junior colleges, etc.)	Grade 1-3
	· Placement-based on-the-job training (recruitment camps, field trips, on-site experience)	Grade 1-3
	· Employment contract-based on-the-job training	Grade 3

Source: Ministry of Education and KRIVET (2020), “On-the-job Training Operating Manual for Vocational High Schools” (March 2020), p. 8

(3) Basis for Operating On-the-job Training

As a form of work experience training, on-the-job training is provided as part of formal education, based on the General Guidelines for Elementary and Secondary School Curriculum and legislation such as the Vocational Education And Training Promotion Act and its Enforcement Decree, the Industrial Accident Compensation Insurance Act, and the Occupational Safety And Health Act.

The details of the provisions stipulated in each Act are summarized under “Basis for Operating On-the-job Training” in Table 3-3.

<Table 3-3> Basis for Operating On-the-job Training

Category	Relevant Provisions
Vocational Education And Training Promotion Act and Enforcement Decree	Article 7 (On-the-Job Training), Article 7-2 (Operational Criteria of On-the-Job Training), Article 7-3 (Establishment and Operation of Employment Support Center), Article 8 (Selection of On-the-Job Training Industries), Article 9 (On-the-Job Training Contracts), Article 9-2 (On-the-Job Training Hours), Article 26 (Penalty Provisions), Article 9-3 (Field Guidance of Vocational Education and Training Instructors at Industries), Article 9-4 (Responsibilities of On-the-Job Training Industries), Article 9-5 (Safety Education of On-the-Job Training)
General Guidelines for Elementary and Secondary School	Notification by the Ministry of Education, No. 2018-150
Industrial Accident Compensation Insurance Act	Article 123 (Special Cases concerning On-the-Job Trainees)
Occupational Safety And Health Act	Article 166-2 (Special Cases concerning On-the-Job Trainees)

Source: Ministry of Education, Korea Student Aid Foundation, and KRIVET (2021), pp. 10-13; reorganized by the researchers

2) On-the-job Training as Parallel Work-and-learn System in Specialized High Schools

Secondary vocational schools in Korea are divided into specialized high schools, Meister high schools (high schools customized to industrial demands), and general high schools operating vocational classes.

Industry-academia vocational apprenticeship schools comprise a type of on-the-job training as a parallel work-and-learn system that is implemented as a dual system in which students come and go between schools and companies to receive the relevant education with government support, once a project proposed by a specialized high school is selected by the government.

(1) Industry-academia Vocational Apprenticeship Schools

Industry-academia vocational apprenticeship schools refer to a parallel work-and-learn system in

high school education, a new vocational education model that combines the strengths of school-centered vocational education in Korea and industrial field-oriented vocational apprenticeship education in Switzerland (relevant ministries, 2015:1).

In other words, it is aimed at enhancing the practicality of vocational education, addressing the issue of employment mismatch, and revitalizing youth employment, by adapting the apprenticeship education model from Germany and Switzerland, where students simultaneously learn from schools and businesses, to the Korean context. It was placed into pilot operation in 2015 and continues to operate to date as of 2022.

(2) Characteristics of Industry-academia Vocational Apprenticeship Schools

Industry-academia vocational apprenticeship schools refer to a part of secondary work experience education that is implemented as a parallel work-and-learn system.

It is a form of special secondary vocational education in Korea, which is conducted according to the relevant regulations in cases where departments in specialized high schools that are eligible to apply for apprenticeship training submit an application, meet the appropriate requirements, and become selected by the government.

The characteristics of industry-academia vocational apprenticeship schools are as shown in Table 3-4.

<Table 3-4> Characteristics of Industry-academia Vocational Apprenticeship Schools

Category	Industry-academia Vocational Apprenticeship School	Notes
Overview	Apprenticeship-eligible departments in specialized high schools (field-oriented TVET model)	
Participating students	Selected among first-year students in specialized high schools	
Characteristics	Joint development and operation of education and training programs by participating schools and companies (NCS-based education and training) ※ Students simultaneously receive education from their schools and companies for 2-3 years.	

3.2.2. Work Experience Education in Higher Vocational Education

Industry-academia collaboration that takes place in higher vocational education in Korea links industries, higher education institutions, research institutes, and governments, with the aim to cultivate high-quality workplace personnel. As most industry-academia collaboration is led by the central government, government subsidies account for the largest portion of project operating costs (Kim, Chun-Shik, 2019, p. 62).

Recent years have seen a significant increase in the quantity of on-the-job training provided as work experience education by universities as the main higher education institutions in Korea. Meanwhile, the Ministry of Education has established an institutional environment aimed at revitalizing on-the-job training through the formulation of an operating manual for on-the-job training for students in tertiary level institutions. On-the-job training is recognized as an important means to address the mismatch between theory-oriented education in higher education institutions and industrial demand that value practical skills, and improve the employment rate. However, the implementation of on-the-job training has also raised the need for its substantive and qualitative improvement as well as the need to ensure the self-sufficiency and sustainability of on-the-job training in higher education institutions in order to foster talented workers (Jang, Hoo Eun et al., 2017, p. 494).

1) Legal Basis, Concepts, and Types of Work Experience Education in Higher Vocational Education

(1) Legal Basis for On-the-job Training as Work Experience Education

The legal basis for on-the-job training in Korea is stipulated in the Education Act enacted and promulgated in 1949, which can be regarded as the founding regulation regarding on-the-job training. Article 11 of the Act stipulates that “all facilities available for other education including factories and workplaces can be used for education provided that they do not interfere with their original usage.”

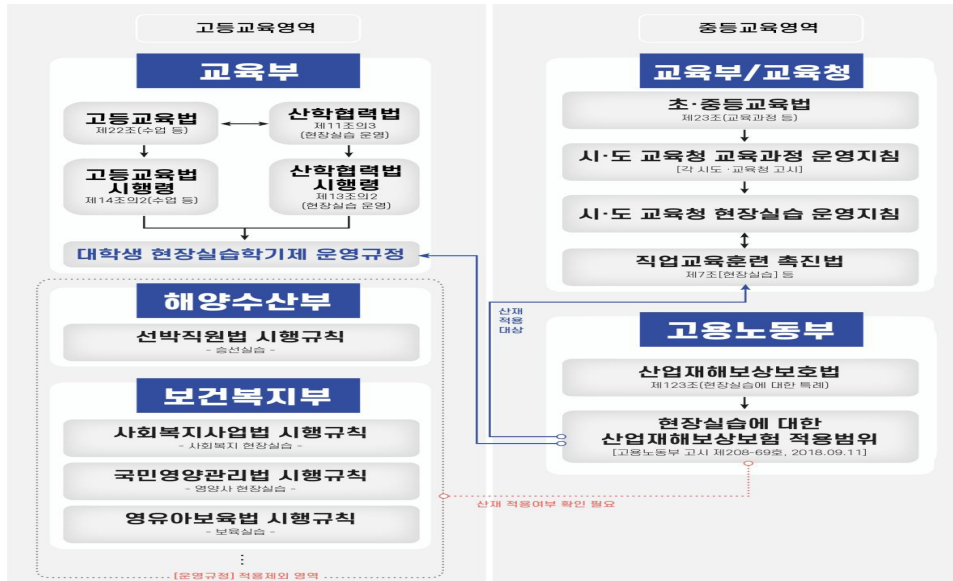
To briefly review the major relevant milestones over the years, Article 3 of the Industrial Education Promotion Act, which was enacted and promulgated in 1963, stipulates that the state shall encourage local governments to promote industrial education, such as on-the-job training, etc., based on close cooperation with industries. Article 3-2 of the same Act amended in 1973 mandates that “the students at schools conducting industrial education shall take on-the-job training at companies for a certain period of time while attending school.” Its amendment in 1995 overhauled various industrial education systems with the aim to efficiently provide on-the-job training through companies by establishing the Industrial Education Council, a private consultative body under the Korea Chamber of Commerce, and facilitating organic industry-academia

collaboration between industrial education institutions and companies. In 2003, the Act was wholly amended to the “Industrial Education Enhancement And Industry-Academia-Research Cooperation Promotion Act,” which provides the basis for establishing school enterprises in Article 36 so that an industrial educational institution may have a department directly manufacturing, processing, repairing, selling goods and providing services, etc. in connection with a specific course of study or curricula.

The term “on-the-job training” was first used in the Industrial Education Promotion Act amended in 1973 and has since been used in the current Vocational Education And Training Promotion Act. However, it was a source of confusion as overlapping meanings were used without providing a clear definition and criteria. Therefore, according to the recent revision of the Higher Education Act and its Enforcement Decree, the operating regulation which had defined “on-the-job training classes” as one of the “classes conducted outside of schools” was subsequently revised to mandate the use of the term “on-the-job training semesters.” Article 23 of the Higher Education Act stipulates provisions necessary for recognizing the academic credits for training conducted in companies, etc. Article 14 (Credit Hours) of its Enforcement Decree states, “Credit hours referred to in Article 21 (2) of the Act shall be at least 15 hours each semester” (Choi Soon Sik, 2015, p. 156).

Accordingly, the Ministry of Education distributed the “Operating Regulation Manual on On-the-job Training Semesters for College and University Students” in July 2021 and has since implemented it (Ministry of Education, 2021a). The manual was aimed at providing college and university students with high-quality curricula, by offering more effective on-the-job training opportunities to protect them from safety issues, etc. that may occur during the training period, in addition to a unified standard for on-the-job training, as it had previously been operated under different standards by each college and university.

<Figure 3-3> Legal System Regarding “Operating Regulation Manual on On-the-job Training Semesters for College and University Students”



Source: Ministry of Education (2021a), 2021 Operating Regulation Manual on On-the-job Training Semesters for College and University Students

(2) Concepts and Types of On-the-job Training as Work Experience Education

Conceptually, on-the-job training is essentially defined as empirical learning through placements at industrial workplaces, and is divided into field trips, field training, and industry-academia collaboration. There are varying academic concepts and definitions of on-the-job training. Considering its functions and characteristics, on-the-job training is also referred to as “internships” or “interns” in Korea, “internship,” “sandwich system,” or “sandwich placement” in the United Kingdom, and “cooperative vocational education” or “occupational education” in the United States. In addition, various other terms such as “work experience,” “supervised occupational experience (SOE),” “field practice,” and “work-based learning” share similar meanings (Choi Soon Sik, 2015, p. 153). On-the-job training is directed toward simultaneously benefiting both companies and schools as it can demonstrate the effect of learning through work and transitioning to the labor market, by providing students with opportunities to acquire hard and soft skills and companies with productivity and employment benefits (Choi Soon Sik, 2015, p. 154).

There are several types of industry-academia collaboration programs in Korea, including the following key projects.

First, the “Hub UNiversity for Industrial Collaboration” (HUNIC, 2004-2011) program has been implemented as a joint policy between the Ministry of Education & Human Resources Development, which is responsible for education and human resources policies (supplier of human

resources), and the Ministry of Commerce, Industry and Energy, which is in charge of industrial policies (demand for human resources) since 2003 until 2011. The project was aimed at selecting and fostering higher education institutions focused on industry-academia collaboration to convert industrial complexes into “innovation clusters.” It supported higher education institutions to expand the research functions and network capabilities of industrial complexes.

Second, the “Leaders in INdustry-university Cooperation” (LINC, 2012-2016) program was implemented with the aim to enhance the sustainability of industry-academia collaboration through the overhaul of higher education systems and establish an autonomous, sustainable industry-academia collaboration system between higher education institutions and local institutions (or companies) instead of heteronomous industry-academia collaboration dependent on government support.

Third, the largest budget was allocated to the “PRogram for Industrial needs-Matched Education” (PRIME, 2016-2018) among all program units (Ministry of Education, 2015). The project, which was completed at the end of 2018, had been envisioned under the goal of achieving the quantitative and qualitative structural reform of higher education institutions in response to the decline of the school-age population. Specifically, it contributed to the qualitative improvement of curricula in higher education institutions to address the issue of the mismatch between graduates and the labor market, and focused on revamping higher education institutions through the reorganization of academic affairs and the enrollment quota in reflection of social and industrial demands, based on the medium- to long-term national supply and demand outlook on human resources.

Fourth, the “Software-centered University Project” has been implemented by the Ministry of Science, ICT and Future Planning (currently the Ministry of Science and ICT) since 2015 with the aim to enhance the competitiveness of the nation, businesses and students, and take the lead in expanding the value of software by reforming software education in higher education institutions based on industry needs (Kim, Chun-Shik, 2019, pp. 62-63).

Table 3-5 below summarizes the operation of various projects that are currently being implemented and financially supported in Korea, under terms such as on-the-job training, industry professional practice (IPP), industry placement, and internship.

<Table 3-5> Types of On-the-job Training Projects in Higher Education Institutions Financially Supported by Government Ministries in Korea

Supervising Ministry	Relevant Projects	Training Allowances (Companies)	Government Subsidies	Notes
Ministry of Education	LINC+, university innovation support project,	Varies by company *From unpaid to minimum wage or	Operating standards vary by school. *KRW 200,000-1,300,000/month,	Ambiguity of obligations and standards for payment of training

	etc.	more, etc.	etc.	allowances
Ministry of Employment and Labor	IPP-type parallel work-and-learn system (Industry Professional Practice)	(Recommended standard) Approximately minimum wage (per month) excluding KRW 400,000	KRW 400,000/month	Mandatory payment of a certain amount
Ministry of Science and ICT	Project internship linked to ICT credits	KRW 450,000/month	KRW 1,000,000-1,400,000/month	No actual burden on companies due to support from mentoring (management) allowances
	Software-centered university	Varies by company	Operating standards vary by school.	Standards vary by college and university. *Unqualified on-the-job training is also counted as performance.
Ministry of SMEs and Start-ups	Support project for R&D industry interns in local small and medium-sized businesses	KRW 300,000/month	KRW 1,500,000/month	No actual burden on companies due to support from mentoring (management) allowances

Source: Ministry of Education (2021a), *2021 Operating Regulation Manual on On-the-job Training Semesters for College and University Students*

2) Operational Status and Improvement Plans for Work Experience Education in Higher Vocational Education

(1) Current Status of On-the-job Training and Work Experience Education

The types of on-the-job training as work experience education can be classified as follows.

First, sequential on-the-job training refers to education provided in dualized phases through theoretical education at higher education institutions and on-the-job training at companies, with

the curriculum for each major reinforcing on-the-job training at the workplace. For example, in the case of two-year junior colleges, freshmen take theoretical courses and on-the-job training with a focus on basic major subjects, and sophomores take project-oriented courses on advanced technology theories and on-the-job training at companies, which allows the demands of partnering companies to be reflected.

The second type is on-the-job training semesters and multi-semester on-the-job training. In the case of junior colleges, trainees in on-the-job training semesters can undertake intensive on-the-job training at companies while continuing to attend courses at school for a semester including vacation and have their credits recognized. Employment contracts are signed between trainees and companies prior to the training, and the required time for training is fulfilled flexibly, such as on a daily or weekly basis or within a certain period of time, so that trainees can come and go between schools and companies to undertake the training. The multi-semester system operates for four semesters or more, i.e. six to eight semesters including the on-the-job training period, and higher education institutions that operate the system are recommended to implement on-the-job training semesters.

The third type is on-the-job training linked to school enterprises. Through the type, school enterprises affiliated with higher education institutions are established in addition to an industry-academia linkage system to be utilized for educational purposes by faculty members, students, and corporate workers. Legal and administrative support systems for school enterprises are also built to develop and implement on-the-job training programs for school enterprises. In addition, it may be a valid new approach to provide on-the-job training in collaboration with tenant companies of business incubation centers within higher education institutions and corporate research institutes.

Fourth, multi-phase on-the-job training refers to a program that is conducted in phases where participating students sequentially take courses in industry-academia orientation (one to three days), factory training (two weeks or more), on-the-job training (four weeks or more), and internships (12 weeks or more) in preparation for employment. Under this program, students earn a total of eight credits once they complete the entire course, and the program is already being operated by some higher education institutions.

Fifth, customized on-the-job training is aimed at cultivating specialized human resources suitable for duties demanded by companies. To this end, educational programs are jointly developed with companies. The type of training allows students to gain work experience through on-the-job training and ultimately encourages their employment in partnering companies. Learning effects can be maximized and job competency can be improved through the implementation of specific goals and content of on-the-job training in phases. Companies can reduce education costs for new employees and immediately utilize available human resources, and higher education institutions can improve the employment rate by addressing the employment mismatch through customized education.

Sixth, the IPP is a systematic Korean-style cooperative education model, which is distinct from the existing on-the-job training system. It allows some curricula of higher education institutions to be taken at companies and aims to address the mismatch between higher education institutions and companies, improve students' practical job skills and employment rate, and address youth

unemployment issues. Students can receive an average monthly allowance of approximately KRW 1 million from companies and earn credits (up to 15 credits) necessary for graduation. The IPP system is divided into the recruitment-linked type (aimed at enhancing employment capabilities, mainly undertaken by seniors in universities) and the practical skills improvement type (aimed at improving major- and non-major-related capabilities and exploring aptitudes and career paths, mainly undertaken by juniors in universities) (Choi Soon Sik, 2015, pp. 157-158).

The types of on-the-job training are summarized in Table 3-6 below.

<Table 3-6> Types of On-the-job Training in Korea

No.	Name	Content
1	Sequential on-the-job training	Theoretical education in higher education institutions and on-the-job training in companies are dualized and sequentially conducted.
2	On-the-job training semesters, multi-semester on-the-job training	In the case of junior colleges, trainees of on-the-job training semesters undertake intensive on-the-job training at companies while continuing to attend courses at school for a semester including vacation and have their credits recognized. The multi-semester system operates four semesters or more, i.e. six to eight semesters including the on-the-job training period.
3	On-the-job training affiliated with school enterprises	School enterprises affiliated higher education institutions are established in addition to an industry-academia linkage system to be utilized for educational purposes by faculty members, students, and corporate workers.
4	Multi-phase on-the-job training	Training is conducted in phases where participating students sequentially take courses in industry-academia orientation (one to three days), factory training (two weeks or more), on-the-job training (four weeks or more), and internships (12 weeks or more).
5	Customized on-the-job training	Educational programs are jointly developed with companies with the aim to cultivate specialized human resources suitable for duties demanded by companies. The system allows students to gain work experience through on-the-job training and ultimately encourages their employment in the partnering companies.
6	IPP	A systematic Korean style cooperative education model, which is distinct from the existing on-the-job training system

(Summarized by the researchers)

(2) Statistics on the Current Status of Work Experience and On-the-job Training at the Tertiary Level

According to the educational statistics recently released by the Ministry of Education, the number of students and companies participating in on-the-job training continued to decline from 2017 to 2020, when the COVID-19 outbreak started. The statistics were compiled by surveying the number of students who completed vocational training, partnering companies, the ratio of students who completed training by period, and the ratio of students who received allowances by period (Ministry of Education, 2021a).

Above all, the number of students who completed training continued to increase from 81,822 in 2011 to 160,324 in 2016, but decreased to 153,182 in 2017, 145,221 in 2018, 128,054 in 2019, and 87,797 in 2020. In particular, the number declined year-to-year by 31.4 percent in 2020, caused by difficulties in conducting on-the-job training due to the pandemic-induced changes in the social and economic environment.

Causes of the decrease in the number of students who completed on-the-job training

→ A more cautious stance taken by companies in deciding whether to participate as partnering companies, due to the impact of the economic climate and the strengthening of rights and interests for participating students.

Major policy changes

(1) Amendment of the “Operating Regulation on On-the-job Training for College and University Students” (Ministry of Education, March 2017): Mandated the signing of a contract prior to training, meeting class requirements, etc.

(2) Amendment of notification on “Application Scope of Industrial Accident Compensation Insurance for On-the-job Trainees” (Ministry of Employment and Labor, September 2018): The application scope of industrial accident compensation insurance for on-the-job trainees, which had been limited to vocational high school students, was expanded to include junior college and university students.

<Figure 3-4> Number of Students Who Completed On-the-job Training (unit: persons)



Source: Ministry of Education (2021b:40), 2020 Survey Report on University-Industry Collaboration Activities

Second, 53,785 companies partnered with a total of 292 higher education institutions (an average of 184 companies per institution) for on-the-job training in 2020. This indicates a drop of 44.8 percent from 2016 (97,413) in terms of the total number of partnering companies and a decrease of 135 from 2016 (an average of 319) in terms of the average number of partnering companies per institution.

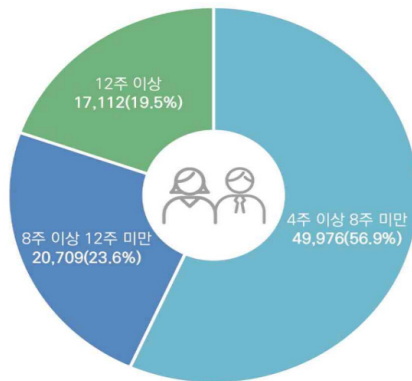
<Figure 3-5> Number of On-the-job Training Partnering Companies (unit: persons)



Source: Ministry of Education (2021b:40), 2020 Survey Report on University-Industry Collaboration Activities

Third, in terms of the training period ratio, students who completed on-the-job training in four to eight weeks (120-140 hours, hereinafter referred to as “four-week students”) accounted for 56.9 percent (49,976). The ratio was 23.6 percent (20,709) for those who completed in eight to 12 weeks (240-360 hours, hereinafter referred to as “eight-week students”), and 19.5 percent (17,112) for 12 weeks or more (360 hours or more, hereinafter referred to as “12-week students”).

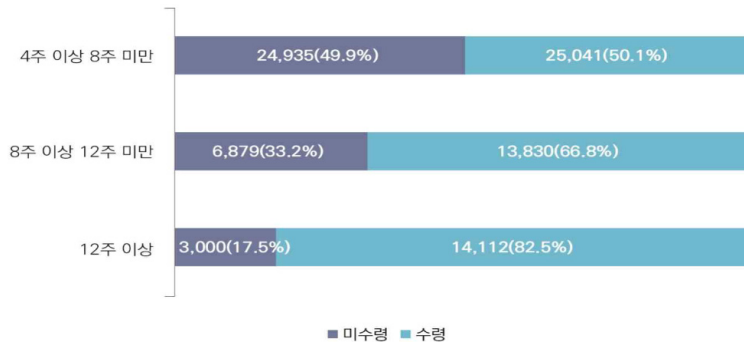
<Figure 3-6> Ratio of Students Who Completed Training by Period (unit: persons)



Source: Ministry of Education (2021b:41), 2020 Survey Report on University-Industry Collaboration Activities

Fourth, in terms of the ratio of students who received allowances by training period, 50.1 percent (25,041) of the four-week students, 66.8 percent (13,830) of the eight-week students, and 82.5 percent (14,112) of the twelve-week students received on-the-job training allowances.

<Figure 3-7> Ratio of Students Who Received Allowances by Training Period (unit: persons)



Source: Ministry of Education (2021b:41), 2020 Survey Report on University-Industry Collaboration Activities

(3) Issues Concerning Work Experience Education and On-the-job Training in Higher Vocational Education

Despite many achievements in work experience education and on-the-job training provided in higher vocational institutions to date, various problems have been highlighted from several perspectives (Kim Geun-jong, 2006; Choi Soon Sik, 2015, pp. 170-171).

First, the awareness of on-the-job training remains weak. Since on-the-job training subjects are mostly major or general electives, there is no obligation for students to undertake them. Trainees tend to simply take the training to earn credits, and there is little interest in and perception of training as an essential tool for finding employment. In the case of training institutions (companies), training tends to be less effective due to the lack of clear training needs, trainee utilization plans or specific training programs.

Second, on-the-job training institutions do not make adequate maintenance efforts. Training institutions do not sufficiently implement follow-up management activities such as conducting satisfaction surveys and allocating the time for listening to participants' difficulties, or activities for sustaining their relationships with quality training institutions such as by supporting them separately as an incentive.

Third, the demand survey on on-the-job training institutions is relatively weak. At present, training is generally provided by family companies or university department-related companies, without the sufficient regular and systematic inspections of training institutions and trainees. Therefore, there are a significant number of cases where students, who are supposed to learn, end up being assigned an excessive volume of menial tasks or working in a department unrelated to their majors at training institutions.

Fourth, there are inadequate efforts to develop on-the-job training models that reflect current trends. Despite the changes and trends in the training environment, the customary and repetitive implementation of existing types of training has caused discrepancies with training institutions. There are also difficulties in broadly disseminating new types of on-the-job training.

Fifth, there is an inadequate system for on-the-job training support and integrated management. Although the on-the-job training support center was established to ensure the effective operation of on-the-job training, it has been somewhat ineffective due to the lack of strong central governance over workplace performance during the training. Meanwhile, students sometimes do not receive proper information owing to poor communication between schools and companies. In addition, although the online operation system was introduced to address the issues of managerial inefficiency and training mismatch that occur offline, it will take time and continuous supplementary efforts to take full effect.

This study inquired with several higher education institutions with regard to cases of contact-free training, and contrary to media reports, responses indicated that contact-free on-the-job training was not provided as often as it had been reported during the pandemic. In particular, Woosong University, Yonam College, Sookmyung Women's University, etc. did not provide ICT contact-free training at all despite claiming to do so on their websites. Relevant personnel at the industry-

academia collaboration center in each institution stated that such training had never been conducted, until face-to-face training began to be offered due to the decrease of COVID-19 cases. Personnel at Ajou University also responded that the school currently conducts face-to-face on-the-job training and only sought to share cases of contact-free training that were briefly carried out during the pandemic.

(4) Measures to Improve the Operation of Work Experience Education and On-the-job Training in Higher Vocational Education

Based on the issues raised regarding the operation of work experience education and on-the-job training, constructive measures for the efficient implementation of such training can be suggested as follows (Choi Soon Sik, 2015, pp. 170-171; Jang, Hoo Eun et al., 2016, p. 497).

First, although on-the-job training in higher education institutions has achieved quantitative growth and systemic improvement, short-term training with low effectiveness is becoming an issue. Therefore, a transition is required from short-term to long-term on-the-job training in a way that can enhance the connectivity with students' majors and develop their practical expertise. Therefore, it is also necessary to continuously secure quality on-the-job training institutions.

Second, the infrastructure for on-the-job training remains weak due to the significant lack of organizational capabilities or experts in higher education institutions. Only around 67 percent of the institutions established organizations dedicated to on-the-job training and only 38 percent hired dedicated personnel. To ensure the effective operation of on-the-job training in higher education institutions, it is necessary to secure professional support organizations and human resources beyond the level required by the current system.

Third, there is an insufficient number of support programs established for the efficient operation of on-the-job training in higher education institutions. It is necessary to develop and implement on-the-job training programs that are tailored for employment and reflect trends. In addition, it would be appropriate to develop and operate new models, such as the creative economy type and the convergence type, in line with current trends and demand for training (Jang, Hoo Eun et al., 2016, p. 497).

Fourth, there is a need for the thorough follow-up management of on-the-job training achievements. It is recommended that higher education institutions review the overall results of training and develop supplementary measures, based on the evaluation of training institutions by trainees and advisers and satisfaction surveys on trainees and training institutions (Choi Soon Sik, 2015, pp. 170-171).

Chapter 4. Practice Enterprises and Digital Competency

4.1. Overview of Practice Enterprises

4.1.1. Experiential Learning and Situated Learning

TVET aims to provide trainees with the knowledge, skills, and attitudes that are necessary in the workplace. While it is possible to acquire the knowledge via the conventional lecture style in a classroom setting, skills and attitudes can be acquired more effectively when the trainees learn directly from experience.

In TVET, experiential learning to attain skills and attitudes is achieved via practice classes or on-the-job-training. Experiential learning in this context refers to learning through firsthand experience, and Kolb suggested five characteristics of experiential learning (Lee, Hyunjeong, et al., 2007:98) as follows:

- (1) Learning is best conceived as a process, not in terms of outcomes.
- (2) Learning is a continuing process based on experience.
- (3) Learning is a holistic process of adaptation toward the world.
- (4) Learning encompasses transactions between the person and the environment.
- (5) Learning is the process of creating knowledge.

However, TVET requires more than experiential learning as it encompasses a trainee's adaptation to the working environment in terms of fulfilling work-related duties upon being hired by a company. In fact, there are many cases of turnover and resignation among employees who have failed to adapt to a company's working environment after employment. This indicates the necessity to enhance workplace adaptability so that both companies and workers can minimize time and economic losses. Thus, situated learning is required in order to help trainees to learn how to cooperate with other workers engaged in different tasks including planning, human resources, administration, manufacturing and research, and gain insight into the business environment. Situated learning theory has been discussed from various aspects and its major concepts of practice, participation, and relation need to be incorporated into the design of a TVET program (Kim, Su-Hee and Jeong, Kwangsoon, 2011:31-34).

4.1.2. Understanding of Practice Enterprises

The concept of PEs is based on the educational philosophy of "learning by doing." PEs have been

selected as an excellent educational case of entrepreneurship training overseas and an outstanding case of online and offline education under the non-face-to-face situation caused by COVID-19 (Source: PEN Worldwide and interviews with related authorities in Korea).

As of 2022, there are approximately 7,000 practice enterprises in more than 40 countries, with varying content and operating methods depending on the country and PE. Practice enterprises collaborate globally and share information and experience among themselves through the PEN Worldwide network (Source: PEN Worldwide).

<Figure 4-1> Overview of Practice Enterprises



Source: PEN Worldwide (penworldwide.org). Accessed on August 10, 2022.

Students who participate in the PE program gain the opportunity to obtain broad insight into corporate work by learning about the general tasks performed at companies, such as planning, accounting, marketing, sales, etc. Through the PE program, learners can work at a company and gain better insight into other employees engaged in different tasks, which will enhance their workplace adaptability.

In addition to learning about general shared tasks at a company, the PE program helps learners to gain work experience preferred by businesses in advance through work experience training in areas required for specific tasks in certain industries. Through the PE program, it is possible to achieve the educational outcomes of experiential learning and situated learning as discussed above.

In line with the increasing importance of digital competency in the era of the Fourth Industrial Revolution and the rising usage of contactless and online tools due to COVID-19, PEN Worldwide has been developing and providing various types of online collaboration tools to be used by practice enterprises within the PEN Worldwide network.

4.2. Operating Cases of Practice Enterprises

4.2.1. Summary of Case Analysis

This section aims to analyze various operating cases of practice enterprises in order to identify implications to help Indonesia introduce and utilize the digital competency-based PE program and provide learners with work experience.

Considering the operating objectives and methods of various PEs, a total of eight enterprises were selected for analysis, including PE programs involving secondary educational institutions, higher educational institutions and companies in a leadership role.

The analysis of operating cases of practice enterprises was conducted based on the investigation items in Table 4-1. The table consists of an “Overview” column of the analyzed PE cases and the “Program” column on their detailed operating status.

<Table 4-1> Items of Case Investigations

Classification	Item
Overview	Program title
	Operating country
	Operating organization (including companies)
	Operating period
	Operating budget
	Operating facility and equipment (including online tools)
Program	Target group
	Training goal
	Preparation for program operation
	Program operation
	Completion criteria (evaluation)
	Certification

The operating cases of the eight PEs are categorized by country, main affiliated institution, target group, and Training goal as below:

- Main affiliated institution: Three secondary schools, four higher education institutions (HEIs), and one company

- Target group: Students from three secondary schools, students from four HEIs, and one group of youths
- Training goal: Entrepreneurship and start-up training (two programs), and job readiness (six programs)

<Table 4-2> Analysis of Operating Cases of PE Programs

No.	Project/Program	Main Affiliated Institution	Target Group	Training Goal
1	Entrepreneurship Practicum for University Students	HEI	Vocational college students	Entrepreneurship/ Start-up training
2	Model Venture Program for Youths	Secondary school	Vocational high school students	Entrepreneurship/ Start-up training
3	Pilot Project of the High School Practice Enterprise Program in Chungcheongnam-do and Jeollabuk-do	Secondary school	Vocational high school students	Job readiness
4	Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs	Company	Youths and adults (18-34 years)	Job readiness
5	Kunsan National University Practice Enterprise Program	HEI	University students	Job readiness
6	IMPEET (Innovative Method to Promoting Entrepreneurship Education to Teenagers) Project	Secondary school	High school students	Entrepreneurship/ Job readiness
7	eXpand International Consultancy GmbH - University of Graz	HEI	University students	Job readiness
8	Europaschule Schulzentrum Sll Utbremen- Effos GmbH	HEI	Vocational college students	Job readiness
9	Logistics Processes in Practice Enterprises (LOGIPRO)	Company, TVET & HEI	Students and youths (16+ years)	Job readiness

4.2.2. Individual Operating Cases by Main Affiliated Institution

Individual operating cases of the PE programs are categorized into secondary schools, high schools and companies according to the types of main affiliated institutions.

1) Main Affiliated Institutions (Secondary Schools)

<Table 4-3> Operating Cases of PEs: Main Affiliated Institutions (Secondary Schools)

Project/Program	Main Affiliated Institution	Target Group	Training Goal
Model Venture Program for Youths	Secondary school	Vocational high school students	Entrepreneurship/ Start-up training
Pilot Project of the High School Practice Enterprise Program in Chungcheongnam-do and Jeollabuk-do	Secondary school	Vocational high school students	Job readiness
IMPEET (Innovative Method to Promoting Entrepreneurship Education to Teenagers) Project	Secondary school	High school students	Entrepreneurship/ Job readiness

(1) Model Venture Program for Youths¹

Classification	Item	Details
Overview	Program Title	Model Venture Program for Youths
	Operating Country	Korea
	Operating Organization (Including companies)	<ul style="list-style-type: none"> Supporting organization: Jeju Self-Governing Provincial Office of Education Operating organization: Jeju Girls' Commercial High School Training organization: KoreaPEN
	Operating Period	<ul style="list-style-type: none"> Operating year: 2019 Operating period: May-November (6 months)
	Operating Budget	<ul style="list-style-type: none"> Funding organization: Jeju Self-Governing Provincial Office of Education Operating budget: KRW 15,000,000

¹ Reference

– KoreaPEN (2019). *A Proposal for a Model Venture Program*

– Jeju Girls' Commercial High School, KoreaPEN (2019). *Outcomes Report of the Model Venture Program* (Supported by Jeju Self-Governing Provincial Office of Education, Operated by Jeju Girls' Commercial High School, Trained by KoreaPEN)

	Facility and Equipment (Including online tools)	<ul style="list-style-type: none"> – Venue: Practice room and club activity room – Equipment: Desks, chairs, desktop computers, laptop computers, etc. – Online tools: PENapps and Google Drive
Program	Target Group	– High school students (students of business management club at Jeju Girls' Commercial High School)
	Training Goal	– Entrepreneurship and start-up training
	Preparation for Program Operation	<ul style="list-style-type: none"> – Participant recruitment: 18 students – Workshop: 14:00-17:30, April 15, 2019
	Program Operation	<ul style="list-style-type: none"> – Program details: 75 hours for 25 weeks (3 hours per week) – Participants: <ul style="list-style-type: none"> (1) Professional instructors: 3 (2) Facilitators: 2 (3) Teachers in charge: 2 (4) Managers: 1
	Completion Criteria (Evaluation)	– Attendance and assignments
	Certification	– Certificate

a) Overview

The Model Venture Program for Youths refers to a project conducted by the Self-directed Learning Center of Seogwipo-si in 2018. It was designed to provide youths with work experience activities to foster their creativity and entrepreneurship in line with the demands of society and businesses in the era of the Fourth Industrial Revolution. The program was first introduced and conducted at Pyoseon High School. In 2019, based on its positive outcomes, the Self-directed Learning Center of Seogwipo-si expanded the program to two schools, Pyoseon High School and Jungmun High School. In addition, Jeju Self-Governing Provincial Office of Education launched a Model Venture Program by designating two vocational high schools, Jeju Girls' Commercial High School and Korea Beauty High School.

b) Training Objectives

Based on the philosophy of “learning by doing,” this program aims to promote start-ups and entrepreneurship by reflecting the reality of business management and operating business management simulations, as well as cultivate the Four Cs (Critical thinking, Creativity, Collaboration, and Communication), which are competencies required in the era of the Fourth Industrial Revolution.

By carrying out every aspect of starting a business in a self-directed manner from start to finish, including discovering ideas and formulating business plans, the participating students gain an understanding of the practical business tasks that are performed during this process, and strengthen global start-up competencies by using global start-up simulation infrastructure that combines online and offline.

The program aims to strengthen the global competencies of the participants by helping them to perform promotion and sales activities, and further generate revenues by making effective use of a global economic ecosystem consisting of approx. 7,000 PEs in 44 countries.

c) Achievements

The Model Venture Competition sponsored by Jeju Self-Governing Provincial Office of Education, Jeju Self-Governing Province Development Co., and Korea Entrepreneurship Foundation drew the participation of six mock venture companies from four schools, among which Jeju Girls' Commercial High School's mock venture company, Juniper, was highly praised and won the Outstanding Work Performance Prize. In addition, two mock venture companies from Pyoseon High School made it into the finals in "Korea Start-up Competition 2019."

(2) Pilot Project of the High School Practice Enterprise Program in Chungcheongnam-do and Jeollabuk-do²

Classification	Item	Details
Overview	Program Title	Pilot Project of the High School Practice Enterprise Program in Chungcheongnam-do and Jeollabuk-do
	Operating Country	Korea
	Operating Organization (Including companies)	<ul style="list-style-type: none"> Supporting organization: Ministry of Education, Jeollabuk-do Office of Education, and Chungcheongnam-do Office of Education Operating organization: Kunsan National University Practice

² References

–Kunsan National University, KoreaPEN (2014). *Outcomes Report on the Pilot Project of the High School Practice Enterprise Program in Chungcheongnam-do and Jeollabuk-do* (Supported by Ministry of Education, Jeollabuk-do Office of Education, and Chungcheongnam-do Office of Education, Operated by Kunsan National University Practice Enterprise Support Center, Jingyeong Girls' High School, Wonkwang Information Art High School, Deogam Information High School, Namwonjeil High School, Jeonbuk High-Tech High School, Janghang Technical High School, and Seochon High School, Trained by KoreaPEN, Participating companies: Korea Broadcast Advertising Corp., Byherb Co., Ltd., DaeKwang-Lightech Co., Ltd., OKETEC Co., Ltd., Hiel Corp., Lohas Hanji Co. Ltd., and Jeongdo Industry Co. Ltd.)

		<p>Enterprise Support Center, Jingyeong Girls' High School, Wonkwang Information Art High School, Deogam Information High School, Namwonjeil High School, Jeonbuk High-Tech High School, Janghang Technical High School, and Seochon High School</p> <ul style="list-style-type: none"> – Training organization: KoreaPEN – Participating company: Korea Broadcast Advertising Corp., Byherb Co., Ltd., DaeKwang-Lightech Co., Ltd., OKETEC Co., Ltd., Hiel Corp., Lohas Hanji Co., Ltd., and Jeongdo Industry Co., Ltd.
	Operating Period	<ul style="list-style-type: none"> – Operating year: March-August 2014 – Operating period: 108 hours for 12 weeks
	Operating Budget	<ul style="list-style-type: none"> – Funding organization: Ministry of Education – Operating budget: KRW 100,000,000
	Facility and Equipment (Including online tools)	<ul style="list-style-type: none"> – Venue: Kunsan National University Practice Enterprise Center and computer labs at high schools – Equipment: Desks, chairs, computers, etc. – Online tools: PENapps and Google Drive
Program	Target Group	– Students from 7 high schools in the Chungnam and Jeonbuk regions
	Training Goal	Job readiness
	Preparation for Program Operation	<ul style="list-style-type: none"> – Participant recruitment: 105 (15 persons × 7 schools) – Orientation for facilitators: 30 hours (April 25-27, 2014)
	Program Operation	<ul style="list-style-type: none"> – Program details: <ul style="list-style-type: none"> (1) 72 hours per week for 12 weeks at each high school (2) 36 hours on every second weekend at Kunsan National University Practice Enterprise Center – Participants: <ul style="list-style-type: none"> (1) Professional instructors: 6 (2) Facilitators: 7 (3) Teachers in charge: 8 (4) Managers: 2
	Completion Criteria (Evaluation)	– Attendance and assignments
	Certification	– Certificate

a) Overview

Inspired by the achievement of the Kunsan National University Practice Enterprise Program and sponsored by the Ministry of Education, Kunsan National University Practice Enterprise Center

hosted this pilot project of practice enterprise for high school students. The university selected six vocational high schools and one general high school located in the Chungcheongnam-do and Jeollabuk-do regions, and operated a practice enterprise program focusing on work experience training.

b) Training Objectives

Unlike superficial practice that turns participants into a passive audience, this project seeks to meet the demand for a transition to practical training where the participants gain deeper insight into workplaces and tasks (based on the “learning by doing” philosophy) by encouraging them to think and work independently.

By interacting with about 7,200 PEs that are active within the global PEN virtual network, participating students have the opportunity to understand job descriptions and improve competencies that are required in actual business activities, while experiencing a global business environment.

Actual companies serve as mentors in the program to share their accumulated know-how and students are empowered to immediately adapt themselves to their future workplace. As a result, the program establishes an advanced vocational education and training system that links schools and companies.

The program aims to present an ideal type of experiential practice and career education that allows students to contemplate their future jobs and careers and make their own judgements and decisions by experiencing actual business activities.

c) Achievements

The participants, consisting of seven PEs for high schools and three PEs for Kunsan National University, held an exhibition in the Dudeurim Center of Kunsan National University.

Through this program, the participating students made a tangible achievement in preparing for their careers and employment. They acquired a better understanding of starting and operating a business, and learned the tasks of each department of the company and the relationships between them by conducting basic tasks assigned to the departments. In addition, the students were able to promote entrepreneurship as well as cooperative and considerate attitudes while experiencing the operation of a company firsthand.

Among the participating schools, Jingyeong Girls' High School signed an agreement for industry-academia cooperation with Lohas Hanji Co. Ltd., which promised to support the school with starting up a business using mulberry fiber products and fostering young talents. Also, Wonkwang

Information Art High School has been operating its own PE training as a practice course in the Start-up Management Department to date.

(3) Innovative Method to Promoting Entrepreneurship Education to Teenagers (IMPEET)³

Classification	Item	Details
Overview	Program Title	Erasmus+ K2 Project “Innovative Method to Promoting Entrepreneurship Education to Teenagers” (IMPEET) project
	Operating Country	Germany, Italy, and Lithuania (joint project)
	Operating Organization	<ul style="list-style-type: none"> – Supporting organization: EU Erasmus+ Project – Operating organization: Vilniaus kolegija/University of Applied Sciences, Lithuania (PE Center of Lithuania) – Educational institution: <ul style="list-style-type: none"> • Vilniaus Kolegija (University, Lithuania) • PEN Worldwide • Istituto Don Calabria (IDC) (vocational education institution, Italy) • Kauno r. Garliavos Jonuciu progimnazija (KGJP) (high school, Lithuania) • Friedrich-Fröbel-Schule (FFS) (high school, Germany) • Istituto Comprensivo “Panfilo Serafini - Lola Di Stefano” SULMONA AQ (high school, Italy)
	Operating Period	<ul style="list-style-type: none"> – Operating year: October 2018-September 2020 – Operating period: More than 3 hours per week, more than 100 hours per year
	Operating Budget	<ul style="list-style-type: none"> – Funding organization: EU Erasmus+ Program
	Facility and Equipment (Including online tools)	<ul style="list-style-type: none"> – Secondary School Practice Enterprise Handbook Criteria Proposal • Venue: A comfortable space of 50-100 m² • Recommended materials and office supplies: Desks, chairs, computers, webcams, fax machines, copying machines, scanners, and printers • Online tools: Websites, email addresses, office software,

³ Reference

- European Union (2019). “IMPEET - Practice Enterprise’s Competencies Frameworks (Germany, Italy, and Lithuania)”
- European Union (2020). “IMPEET - Practice Enterprise Model for Students Aged 12-15 (Germany, Italy, and Lithuania)”
- European Union (2019). “IMPEET - Handbook for Practice Enterprise Teachers in Secondary Education (Germany, Italy, and Lithuania)”

		<p>latest version of MS Office, Google Workspace, free open-source software, etc.</p> <ul style="list-style-type: none"> • The PEs' articles of association, collective agreements, and procedure guidelines by department • Materials and sample lists provided by mentor companies: Product samples, catalogue posters, experiential exhibition rooms, etc.
Program	Target Group	<ul style="list-style-type: none"> – Germany: 10th graders, ages 12-14 – Italy: Students from vulnerable areas, ages 11-15
	Training Goal	<ul style="list-style-type: none"> – Provide competency, skills, and knowledge concerning various aspects of entrepreneurship and related activities. • Knowledge, skills, capabilities, and competencies related to entrepreneurship • Knowledge, skills, capabilities, and competencies related to schools and education: Reading and comprehension, writing, mathematics, and communication skills
	Preparation for Program Operation	<ul style="list-style-type: none"> – Advance preparation: Several meetings with stakeholders in different venues • Development of a handbook for trainers • Development of a practice kit for students – Participant recruitment: 105 persons (15 persons × 7 schools) – Orientation for facilitators
	Program Operation	<ul style="list-style-type: none"> – Program details: <p>(1) Advance preparation</p> <ul style="list-style-type: none"> • At least 1 week prior to the program launch • Details: Prepared with the students. <ul style="list-style-type: none"> – Provide training for the use of work tools and prepare PE supplies. – Assign students to each department of the PE and distribute tasks. <p>(2) Orientation</p> <ul style="list-style-type: none"> – A 1-hour session at least 2 days before the launch of the practice – Prepare and make a presentation on the PE program, and outline its evaluation methods. – Assign students to each department. <p>(3) Teaching teamwork: 72 hours</p> <p>(4) Student activities: 80 hours</p> <p>(5) Student task evaluation by department: 8 hours (through meetings)</p> <p>(6) Final evaluation: Conduct on the last day and calculate target achievement rate.</p> <p>(7) Survey: Conduct a student survey on the last day.</p> <p>(8) Preparation of certificates: Begin preparing from the 1st</p>

		<p>week of the practice program to certify the students' practice and the outcomes of their activities.</p> <p>(9) Summary of the survey results: Once per year</p> <p>(10) Suggestions to improve the PE program: Submit before the next year's program.</p> <ul style="list-style-type: none"> – Participants: <p>(1) PE teachers: 2 teachers per 15 students (Majors: Priority given to Korean, English, ICT, and Math)</p> <p>(2) Coaches and mentors: Connected to mentor companies.</p>
	Completion Criteria (Evaluation)	<ul style="list-style-type: none"> – Calculate the target achievement rate.
	Certification	<ul style="list-style-type: none"> – Certificate – Content of the certificate • Explain the significance of the certificate and its benefits on the students' future career. • Requirements for PE certificate presentation (example attached): Validity secured. Some educational institutions only issue certificates to those who scored 7-10 points. Competency achievement and attendance were added to the evaluation criteria for extracurricular activities. Certificates are presented in 2 formats: in the native language or both in the native and English languages.

a) Overview

IMPEET focuses on creating a Practice Enterprise Model to develop entrepreneurial competencies for teenagers.

The model aims to improve teenagers' entrepreneurial skills, social relationships, behaviors, and motivation.

The Practice Enterprise Model for students aged 12-15 developed three fundamental intellectual products:

- A Practice Enterprise Competency Framework
- A Handbook for Secondary Education PE trainers
- A Practice Kit for Students

The Practice Enterprise Model for students aged 12-15 was operated in three partner countries, and the results were analyzed through the following processes:

- Discussions and debates were conducted among students, parents, trainers, faculty members

and staff, the Practice Enterprise Central Office, and other stakeholders.

- Exemplary cases of students were selected through the PE education and training activities, and trade exhibitions.
- Feedback was received from the students, trainers, and stakeholders.

The program targeted schools that are interested in improving their practice/experience-based education.

b) Training Objectives

Promote entrepreneurship and entrepreneurial thinking among teenagers. Encourage students to understand the importance of entrepreneurship for their future career.

Learn from practice: Provide practical experience in starting and operating a start-up.

Learn from mistakes: Provide an opportunity to learn from mistakes.

Optimize the effectiveness of group learning: Collaborative and interactive learning. The students assigned to different departments conduct assignments together while learning how to maximize the use of individual capacity through collaboration with teammates.

Learn from individual experience and discussions.

Learn problem solving skills.

Focus on seeking opportunities.

Enhance comprehensive learning effectiveness.

Develop individual competitiveness.

c) Achievements

Secondary schools and Practice Enterprise Central Offices of Germany, Italy, and Lithuania participated in this project and created a detailed and systematic program as a model of entrepreneurship education for teenagers.

Essential materials were developed to ensure the sustainable operation and dissemination of the project: A Practice Enterprise Competency Framework, a Handbook for Secondary Education PE trainers, and a Practice Kit for Students.

In Germany, the program was integrated into a school subject and extra hours were added to students' team project activities.

**** An example of curriculum**

- Entrepreneurship
- Communication in English and International Transactions on PE's Networks
- Time Management
- Strategy Development for Problem Solving
- Operating Digital Media
- Team Projects
- Product Development and Manufacturing
- Teamwork and Leadership
- Logistics Planning
- Basic Knowledge of Accounting and Commerce
- Basic Taxation for Enterprises
- Human Resource Management
- Marketing Materials Production (Virtual & Real) and E-commerce Store
- Participation in Trade Fairs

In Italy, the program was not only integrated into a school subject, but also included in the school curriculum as a compulsory education course from a broader perspective on education and training.

German PEs secured Noor GmbH, a local company, as a mentor for the program. This provided students with an opportunity to visit the mentor company and its logistics facility and learn how products are delivered from a manufacturer to customers.

Italian PEs connected students with companies in the local community or their family members as mentors while creating opportunities for them to experience conditions in actual companies.

2) Main Affiliated Institutions (HEIs)

<Table 4-4> Operating Cases of PEs: Main Affiliated Institutions (HEIs)

Project/Program	Main Affiliated Institution	Target Group	Training Goal
Entrepreneurship Practicum for University Students	HEI	Vocational college students	Entrepreneurship /Start-up training
Kunsan National University Practice Enterprise Program	HEI	University students	Job readiness
eXpand International Consultancy GmbH - University of Graz	HEI	University students	Job readiness
Europaschule Schulzentrum Sll Utbremen- Effos GmbH	HEI	Vocational college students	Job readiness

(1) Entrepreneurship Practicum for University Students⁴

Classification	Item	Details
Overview	Program Title	Entrepreneurship Practicum for University Students
	Operating Country	Korea
	Operating Organization (Including companies)	<ul style="list-style-type: none"> Supporting organization: Induk University Operating organization: Induk University Training organization: KoreaPEN
	Operating Period	<ul style="list-style-type: none"> Operating year: 2021 Operating period: January 31-February 10
	Operating Budget	<ul style="list-style-type: none"> Funding organization: Induk University Operating Budget:
	Facility and Equipment (Including online tools)	<ul style="list-style-type: none"> Venue: Virtual Equipment: Laptop computers Online tools: PENapps, Google Workspace, Zoom, and the university learning management system (LMS)

⁴ Reference

–KoreaPEN (2020). *A Proposal for an Entrepreneurship Practicum for University Students*

–Induk University Employment and Startup Support Center (2021). *Outcomes Report on an Entrepreneurship Practicum for University Students*

Program	Target Group	– Vocational college students (students from Induk University)
	Training Goal	– Entrepreneurship and start-up training
	Preparation for Program Operation	– Participant recruitment: 25 students from Start-up Club – Advance meeting with facilitators: Discussion of curriculum design and operation
	Program Operation	– Program details: 40 hours – Participants: (1) Professional instructors: (2) Facilitators: 2 (3) Managers: 2 – Organization of participating students and teams (1) Participants: 25 students from 9 majors (2) Mock venture teams: 5 – Operating method (1) Conduct self-directed assignments (missions): Individual and team missions. (2) Team coaching: 1 hour session for each team (4 sessions per team)
	Completion Criteria (Evaluation)	– 44 missions in 10 stages, scoring more than 480 out of 800 points (23 required missions, 430 points + elective missions)
	Certification	– Credits: 3 – Global certificate

a) Overview

The program was designed to provide students with an opportunity to experience practical tasks for a business start-up in the COVID-19 pandemic situation.

A project-based practice program that offers interactive learning and facilitates collective creativity by organizing teams with different majors and providing mentoring on team-based business start-up tasks.

By designing a mission-based module for start-up tasks, the program encouraged the active participation of the student members of the Start-up Club.

The participants conducted individual and team missions, and submitted reports online.

b) Training Objectives

By designing missions based on tasks that may arise in the process of founding a business start-up

and presenting detailed manuals and referencing materials, the program encourages students to understand and conduct the tasks themselves, instead of merely taking classes that focus on lectures and delivering knowledge. Using this methodology, the program helps students to develop self-directed practical competency for start-ups and use this experience as firsthand reference.

By arranging the group activity sessions to offer coaching and facilitation, the program promotes students' discussions and participation and enhances their self-esteem.

Develop educational measures that build the practical competency for start-ups in a creative manner, and enhance students' concentration and learning effect.

Strengthen global competency by helping students to practice starting a business start-up in a virtual enterprise ecosystem consisting of 7,200 companies in 46 countries.

c) Achievements

Induk University and its students evaluated the program positively, with regard to engaging in overseas sales meetings and marketing meetings with other participating students from virtual PEs in Germany, Italy, and China, and experienced launching business start-ups online.

The outcomes confirmed the potential to utilize this program as an alternative for the Global Field Practice Program for Vocational College, which is supported by the Ministry of Education. Based on this success, the program was adopted for the Online Global Field Practice in Germany in 2021. This program was also selected as an excellent case in the global start-up and employment track of the field practice program for vocational colleges in 2021.

(2) Kunsan National University Practice Enterprise Program⁵

Classification	Item	Details
Overview	Program Title	Kunsan National University Practice Enterprise Program
	Operating Country	Korea
	Operating Organization	– Supporting organization: Ministry of Education and National Research Foundation of Korea

⁵ Reference

- Kunsan National University LINC+ Incubation Project Team (2013-2019). *A Proposal for Kunsan National University Practice Enterprise Program*
- Kunsan National University (person in charge: Jin Jeong-il) (2014-2019). *A Planning for Kunsan National University Practice Enterprise Program*
- Kunsan National University LINC+ Incubation Project Team (2014-2019). *A Result Report on Kunsan National University Practice Enterprise Program*

	(Including companies)	<ul style="list-style-type: none"> – Operating organization: Kunsan National University LINC+ Incubation Project Team and Kunsan National University Practice Enterprise Center – Training organization: KoreaPEN – Participating companies: Intel Korea Co., Ltd., Microsoft Korea Inc., AmorePacific, Samsung Electronics, LG H&H, Wooyang Co., Ltd., Jeongdo Industry Co., Ltd., BaroTech Synergy Co., Ltd., 3D Pro, and Kunsan Horticulture Agricultural Cooperation Federation
	Operating Period	<ul style="list-style-type: none"> – Operating year: Summer/winter seasonal semesters in 2014-2019 (a total of 13 events) – Operating period: 160 hours for 4 weeks
	Operating Budget	<ul style="list-style-type: none"> – Funding organization: Ministry of Education and National Research Foundation of Korea – Operating Budget: Approx. KRW 30,000,000 per event
	Facility and Equipment (Including online tools)	<ul style="list-style-type: none"> – Venue: Kunsan National University Practice Enterprise Center – Equipment: Desks, chairs, computers, projectors, meeting rooms, etc. – Online tools: PENapps and Google Drive
Program	Target Group	– Students from Kunsan National University
	Training Goal	– Job readiness and entrepreneurship
	Preparation for Program Operation	<ul style="list-style-type: none"> – Participant recruitment: 45 (15 persons × 3 PEs) – Orientation for facilitators: 20 hours
	Program Operation	<ul style="list-style-type: none"> – Program hours: 160 hours for 4 weeks, during weekdays – Participants: Approx. 9-10 persons per event (1) Instructors teaching theories: 4 (2) Facilitators: 3 (3) Managers: 2
	Completion Criteria (Evaluation)	– Attendance and assignments
	Certification	– Credits and certificates

a) Overview

Kunsan National University introduced the PE program and established the Practice Enterprise Center in 2013 in order to resolve the dissatisfaction of its humanities and social science major students with their field practice, as well as to improve work and workplace adaptability by offering students with actual work experience, and increase the employment rate. Since its first PE

practice in January 2014, the university operated the program for 160 hours across four weeks during summer and winter seasonal semesters over a period of six years until 2019.

b) Training Objectives

As a PE program that presents an actual business environment to train students, this program established a foundation for business education to complement the limitations of field practice programs for humanities and social science students. The program aims to cultivate competitive talents equipped with business skills and organizational personality.

The program encouraged students to practice at PEs which have a similar organization and structure to an actual company, including departments for human resources, purchasing, logistics, marketing, sales, and accounting, and assign them into major departments in rotation. Through this, the program helped students gain an understanding of the overall operation of a company and equip themselves with practical business skills and mindset by participating in the main tasks of each department.

It also helped students to realize the importance of teamwork and cultivate leadership by actively participating in the practice program while planning, conducting, and evaluating tasks with other teammates within their own PEs based on an understanding of major departments and tasks, rather than learning in a passive manner by conducting assigned tasks.

The program aims to nurture professionals with a global perspective who understand the processes of global business and business transactions between companies and are suited to the globalized era by offering them opportunities to perform mock transactions with about 7,000 PEs in approx. 40 countries using programs required for conducting the practice.

c) Achievements

After the completion of the first program, one of the graduates established a start-up company with support from Intel Korea, which served as the mentor company. Since then, Kunsan National University has exerted efforts to develop a program optimized for Korea by overcoming the limitations of the imported PE program. As a result, the Korea-specific PE program has been operated 13 times over six years, producing approx. 300 graduates.

Given its more efficient practice system compared to a field practice program and its differentiated content, this PE program received positive evaluations from related authorities including the Ministry of Education, companies, and students. Based on these achievements, the Kunsan National University Practice Enterprise Program was selected as an excellent educational program in the LINC+ project and also has served as a model for PE programs in other universities and vocational high schools.

(3) eXpand International Consultancy GmbH - University of Graz⁶

Classification	Item	Details
Overview	Program Title	Practice Enterprise and Quality Management
	Operating Country	Austria
	Operating Organization (Including Companies)	Operating/training organization: University of Graz
	Operating Period	<ul style="list-style-type: none"> – Operating year: 2004 - present – Operating period: 1-semester course, 6.5 hours/week
	Operating Facility and Equipment (Including Online Tools)	<ul style="list-style-type: none"> – Offices equipped with PCs and Enterprise Resource Planning (ERP) software for students on campus – Start using online meeting and networking platforms such as Skype4Business, UniMeet, Webex, and Wonder.me (due to COVID distancing measures).
Program	Target Group	<ul style="list-style-type: none"> – Graduate students of the Department of Business Education and Development (master's program)
	Training Goal	<ul style="list-style-type: none"> – Prepare students to teach PE classes and train trainees. – Prepare students for jobs and careers in the field of business and economics. – Operate the PE department to offer a practice-oriented education and prepare students optimally for the role of teacher of economic subjects. – Serve as an innovative learning site for students as well as the management of PEs.
	Preparation for Program Operation	<ul style="list-style-type: none"> – 3 semesters out of a 5-year master's program (6 credits in major courses) – Annual planning determined by instructors (professors) – Enrollment of 15-20 graduate students – Subject title: Practice Enterprise and Quality Management (an introductory course for the major of the master's program) – 2 PEs • eXpand International Consultancy (proceeding in English) • KFUNLine (proceeding in German)
	Program Operation	<ul style="list-style-type: none"> – Faculty • Supervisor: In general, the PE is operated by 2 instructors. • Support from language coaches for business English practice.

⁶ References

- Hristo Mavrudiev, Rima Baciulyte. (2022). "HEIPNET - Recommendations for Practice Enterprise Curriculum/Module Improvement"
- Elisabeth Riebenbauer et al. (2022). "HEIPNET - Manual for Practice Enterprise Implementation in Higher Education Institutions"

		<ul style="list-style-type: none"> – Operating program • Writing an application letter: résumé, department application. • Department allocation: Place students according to their individual preferences, strengths, and weaknesses. • Handover: Students from the previous semester attend the program, demonstrate their processes and tasks, and hand over the manual to new students of the specific department. Department tasks are updated on a regular basis. • Task performance: To maintain the quality of work processes, students regularly participate in business meetings and discuss strategic questions and their daily tasks (updates on ongoing work, report management, and updates on projects and priorities).
	Completion Criteria (Evaluation)	<ul style="list-style-type: none"> – Evaluation • Regular performance assessment • Active participation in business meetings and group activities • Design presentations and discussions • Create an end-of-semester portfolio. – Grading components • Meetings (contributions, presentations) (10%) • Independent corporate work in the departments/processes assigned (20%) • Discussion of relevant literature, reflection on PEs as a learning and teaching method (20%) • PE visit (10%) • Skills demonstration (20%) • Portfolio (20%)
	Certification	<ul style="list-style-type: none"> – Earn 6 credits

a) Overview

This program aims to prepare the students of the Department of Business Education and Development at the University of Graz to teach PE classes and train trainees. The program operates a PE course consisting of eXpand International Consultancy and one other PE as a subject named Proseminar Practice Enterprise and Quality Management.

The PE eXpand International Consultancy is an international provider of consulting services and international market analyses.

In Austria, PE is operated as a core subject in secondary schools from the perspective of forming a virtuous cycle.

The organizational structure consists of processes and departments including Consulting and Sales, Learning Points, Accounting, Monitoring and Support, Marketing, and Management.

While taking PE programs, students can learn about complex practice areas through experiences and further analyze and reflect the method of operation.

After working and learning in PEs for a semester, students can evaluate and apply PE instructors' various roles as well as understand and control operational and economic structures and processes.

In general, at the University of Graz, students attend a two-day strategy seminar at the beginning of the semester as part of the PE work to get to know each other and learn about the PE methodology with a focus on team-building.

Students learn how to model a PE, develop teams, coordinate groups, and deepen their skills of conflict resolution, collaboration, and teamwork (see Appendix for detailed course curriculum).

Mentoring and Coaching

- A major Austrian credit rating agency Raiffeisen Landesbank AG serves as the mentor to support the PE program run by the University of Graz.
- Provides limited financial support as a sponsor.
- Securing a prominent credit rating agency as a sponsor allows both PEs and students to produce outcomes beyond monetary value.
- The mentorship provided is as follows:
 - (1) Provide business expertise and support the establishment of product programs and business plans: Although the PE program run by the University of Graz is not in the banking sector, students and instructors from the program engage in regular meetings with the executives and employees of Raiffeisen Landesbank AG on site to receive feedback and advice on issues including customer segmentation strategies, market observation procedures, and marketing actions.
 - (2) Hold a portion of the meetings in the form of social and networking activities.
 - (3) Support students to gain in-person and virtual business experience as they would in a real business through on-campus visits by mentors and students' visits to the mentor companies.
 - (4) Conduct real-world partnership projects in the form of a contest: Provide students with practical problems to address through events.

b) Training Objectives

Develop and operate a systematic graduate school curriculum to prepare a PE instructor to teach PE classes and train students.

Prepare students for jobs and careers in the business and economic sectors.

Offer students a practice-oriented education and ensure that students are optimally prepared for their roles as economics teachers.

Serve as an innovative learning site for students as well as the management of PEs.

c) Achievements

Enabled the proactive training of future PE teachers, and the systematic operation of the PE program, which is being implemented as a compulsory course in the Austrian secondary school curriculum.

Enabled the professional design, analysis, and application of the PE program by operating a PE at the consulting level in a graduate school course.

(4) European School Utbremen⁷

Classification	Item	Details
Overview	Program Title	Europaschule Schulzentrum SII Utbremen - Effos GmbH (DE01EFF)
	Operating Country	Germany
	Operating Organization (Including Companies)	<ul style="list-style-type: none"> Supporting institution: EU Erasmus+ and local and regional school authorities Operating/training organization: European School Utbremen (Europaschule Schulzentrum SII Utbremen (Size: 1,800 students, 140 teachers)
	Operating Period	<ul style="list-style-type: none"> Operating year: 1983 - present Operating period: 24 hours/week, all year round (term-time)
	Operating Budget	<ul style="list-style-type: none"> Funding organization: EU Erasmus+ and local and regional school authorities
	Operating Facility and Equipment (Including Online Tools)	<p>Infrastructure, facilities, educational equipment, and online and offline tools</p> <ul style="list-style-type: none"> Organize the PE lab like an office with desks and chairs. Equipped with PCs and other necessary office supplies and stationery Software and digital tool: Use ERP (SAP) for standard Microsoft Office software, task management software, and PE operations and sales.

⁷ References

- Nils Peschke (2020). *PE Concept and the Role of Partnerships, Projects and Partners*. www.szut.de
- Nils Peschke, “Request to Assist on Data Collection.” Received by Tuya Shishmishig, 23 September 2022. Email interview.

Program	Target Group	<ul style="list-style-type: none"> – Students majoring in business and economics and foreign languages (2-year course) – Students majoring in business and economics and foreign languages (4-year course including A-grade qualified universities) – Students majoring in business and economics, IT, and information processing (2-year course) – Students majoring in mathematics and management informatics (2-year course) – Students majoring in mathematics and management informatics (3-year course including admission qualifications for college of applied sciences)
	Training Goal	<ul style="list-style-type: none"> – Provide future-oriented education suitable for the changing labor market. – Support students to additionally or comprehensively acquire top college admission qualifications.
	Preparation for Program Operation	<ul style="list-style-type: none"> – Program operation process • (Step 1) Evaluate students' skills and abilities (evaluator: teacher). • (Step 2) Apply for a PE: Write an application letter and a résumé, and then apply for a desired department. • (Step 3) Allocate applicants to departments (jointly determined by faculty and the student). • (Step 4) Commence work.
	Program Operation	<ul style="list-style-type: none"> – Curriculum composition • PE programs are integrated into the school curriculum. • Curriculum: Vocational training including various full-time and part-time curricula • The PE program aims to achieve results surpassing general commercial education and therefore adopts international business activities and training along with the use of professional ERP software (SAP). – Participants: 2-3 teachers/trainers and trainees – Key elements for curriculum design and structured program operation • The linkage between vocational education and general education • Aims toward highly diverse education with a synergic effect. • International activities and exchanges (Europe and East Asia) • Anti-racism working group School with Courage (SMC) • Maintain optimization and quality control of education through a powerful culture of internal and external collaboration. • Combine with MINT-EC (Excellence Center) - STEM (Science, Technology, Engineering, and Mathematics) program.

	Completion Criteria (Evaluation)	<ul style="list-style-type: none"> – Evaluation criteria items <ul style="list-style-type: none"> • Quality of work • Speed of work • Expertise • Initiative • Teamwork and collaboration capabilities • Communication skills – Evaluation results: <ul style="list-style-type: none"> • Work log (report) and final report (booklet format)
	Certification	<ul style="list-style-type: none"> – The PE program is part of the school curriculum. – It is also a process required for passing the final exam (for graduation).

a) Overview

Europaschule Schulzentrum Utbremen, a German educational institution certified as a European school in 2007, has operated a PE named Effos GmbH since 1983.

The original leader from the early days of the PE program remains in charge (with a career of more than 20 years in the PE program).

The faculty members within the program are composed of people with corporate work experience.

The PE program has been integrated into both general education and vocational education.

The PE affiliated with the school is a retail and wholesale company whose main products are sports equipment.

Organize departments into those generally found in enterprises and reflect students' majors in their allocation to departments.

- Import and export department: Document management of customs, import, and export and English commercial correspondence
- Finance department
- Marketing and e-commerce department
- Human resources department

b) Training Objectives

Offer future-oriented education suitable for the changing labor market.

Support students to acquire additional or integrated college entrance qualifications.

Allow students to expand their language diversity and improve their foreign language competency.

Allow students to develop their knowledge about other cultures into intercultural competence via exchanges and activities with foreign PEs.

c) Achievements

Europaschule Schulzentrum Utbremen has been certified as a STEM-friendly school since 2012 in recognition of its educational achievements.

Attained the status of a community academy working together with Hochschule Bremen and Cisco Systems, Inc. since 2003.

Applied the SAP to business operations in collaboration with Universität Wien, Austria.

Selected as a “privileged” partner school within the framework of the EU Erasmus+ program, being beneficiary of the Leonardo da Vinci project since 2016 in recognition of the achievements of the PE program.

Developed global partnerships through PE programs.

- Offered students exchange programs twice a year through PE partnerships with Shanghai Foreign Language School, China.
- Conducted video conferences with PEs in Korea and had its students and faculty members visit Korea for an international exchange in May 2022.
- Served as a cooperative organization specializing in educational exchange services in the Kultusminister Konferenz.

3) Main Affiliated Institutions (Companies)

<Table 4-5> PE Operational Cases - Main Affiliated Institutions (Companies)

Project/Program	Main Affiliated Institution	Target Group	Training Goal
Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs	Companies	Youth and adults (18-34 years)	Job readiness
Logistics Process in Practice Enterprise (LOGIPRO)	Companies (TVET & HEI)	Students and youth and adults (more than 16 years)	Job readiness

(1) Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs⁸

Classification	Item	Details
Overview	Program Title	Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs
	Operating Country	Korea
	Operating Organization (Including Companies)	<ul style="list-style-type: none"> Supporting institution: Ministry of Employment and Labor Operating institution: Sustainability Management Foundation Training organization: KoreaPEN Participating company: Sartorius Korea Biotech, Sky Patent & Law Firm, GB Ventures Co., Ltd.
	Operating Period	<ul style="list-style-type: none"> Operating year: 2022 Operating period: September-November (3 months), 300 hours
	Operating Budget	<ul style="list-style-type: none"> Funding organization: Ministry of Employment and Labor, Sartorius Korea Biotech, Sky Patent & Law Firm, GB Ventures Co., Ltd. Operating budget: KRW 900,000,000
	Operating Facility and Equipment (Including Online Tools)	<ul style="list-style-type: none"> Venue: Pangyo Technovalley Global R&D Center (Seoul metropolitan area), SPACE COWORK Jeonbuk Provincial Government Branch (Jeonju), Moimgonggan KUKBO (Daejeon) Equipment: Desks, chairs, computers (laptops), projectors, etc. Online tools: PENapps, Google Workspace, and Agile Office Tools (PNP)
Program	Target Group	<ul style="list-style-type: none"> Youth and adults (18-34 years)
	Training Goal	<ul style="list-style-type: none"> Entrepreneurship and Job Readiness
	Preparation for Program Operation	<ul style="list-style-type: none"> Participant recruitment: 100 trainees (20 trainees × 5 teams) Facilitator advance training: 20 hours (July 18-29, 2022)

⁸ References

- Sustainability Management Foundation and KoreaPEN (2022), *A Proposal for a Youth-Friendly Company's ESG Support Project Program*, "Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs"
- Sustainability Management Foundation and KoreaPEN (2022), *An Operational Report on a Youth-Friendly Company's ESG Support Project Program*, "Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs"
- KoreaPEN (2022), *Program Plans and Job Manual for Each Role in Practice Enterprises for a Youth-Friendly Company's ESG Support Project Program*, "Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs"
- KoreaPEN (2022), *Video Collection of Online Mentoring Sessions for a Youth-Friendly Company's ESG Support Project Program*, "Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs"

	Program Operation	<ul style="list-style-type: none"> – Program details <ul style="list-style-type: none"> (1) Friday collective work (online): 65 hours (2) Saturday collective work (offline): 80 hours (3) Remote work (online): 155 hours – Participants <ul style="list-style-type: none"> (1) Theory lecturers: 15 (2) Facilitators: 5 (3) Managers: 7
	Completion Criteria (Evaluation)	<ul style="list-style-type: none"> – Completion is based on practice hours: Provide a certificate to trainees who have completed 70% (210 hours, based on a total of 300 hours) or more of the job/project. – Practice hours: Offline/online collective working hours + hours per task – Composition of hours: Offline collective working hours (80 hours) + online collective working hours (40 hours) + work output (120 hours)
	Certification	<ul style="list-style-type: none"> – Credits and certificate

a) Overview

There is a growing mismatch between the human resources desired by companies and the companies preferred by young people, which is particularly noticeable in the rapidly-developing pharmaceutical and bio-healthcare industry. As a result, there is a lack of opportunities to experience work in the industry and systematic programs to provide support in this regard, despite the increasing demand for bio specialists and young people's interest in the industry. In order to improve this situation, this program has been planned to foster talented workers in the bio-healthcare field.

Selected as the ESG Support Project for Youth-friendly Corporate of the Ministry of Employment and Labor, this project has recruited 100 trainees nationwide and established a total of 5 PEs (3 in the Seoul metropolitan area, 1 in Jeolla-do, and 1 in Gyeongsang-do) and 6 departments centered around the R&D Production team, including HR Administration, Sales and Marketing, Finance and Accounting, ESG, and Patent/IP, and high-quality education has been carried out smoothly by experts from each department with the active participation of experienced special coaches and trainees.

b) Training Objectives

This project aims to establish a representative program for fostering young professionals in the bio-healthcare industry, which can contribute to resolving the labor shortage in the industry, addressing the job mismatch between the industry and job seekers, and strengthening the industrial

competitiveness of Korea's bio-healthcare companies.

Under the bio-healthcare work experience program implemented through virtual companies, young people can be nurtured as bio professionals regardless of their regional or academic background, and companies are able to collaborate to strengthen the business expertise of each department and cultivate communicative employees who can collaborate with relevant departments, in recognition of the importance of fostering bio professionals.

c) Achievements

As the first company-oriented PE program in Korea, this project created a sustainable model for work experience in pharmaceutical and bio-healthcare PEs and fostered professional coaches to provide specialized training and work experience in the industry for human resources, leading to an opportunity to spread it overseas as a youth-friendly ESG program.

Achieved the highest participant completion rate (96 percent) among 20 ESG Projects for Youth-friendly Companies supported by the Korean Ministry of Employment and Labor in 2022.

Produced tangible results including designing five PEs specializing in pharmaceuticals and bio, designing websites for virtual companies and specialized hybrid internship platforms, and developing job manuals for 6 departments and 200 businesses in Korean and English, which are expected to serve as the basis for sustainable development and expansion in the operation of PE programs in bio and similar industries at home and abroad.

Through the experience of operating the first-year project and learning from it, the project identified actual tasks, responsibilities, and risks that may occur among coaches, mentor companies, operating institutions, and educational institutions. In addition, based on this knowledge, it provided an opportunity to establish cost efficiency and an operating system for future projects.

(2) Logistics Processes in Practice Enterprises (LOGIPRO)⁹

Classification	Item	Details
Overview	Program Title	Logistics Processes in Practice Enterprises (LOGIPRO) (integrating logistics processes in PEs)
	Operating Country	Belgium, Germany, Spain

⁹ References

- COFEP & Project Consortium Partners (2022). *Project Result 1- Benchmarking and Analysis Report*
- COFEP & Project Consortium Partners (2002). *Project Result 2 - Implementation Guide and Materials*

	Operating Organization (Including Companies)	<ul style="list-style-type: none"> - Funding organization: Erasmus+ - Project coordinator: Connectief vzw (PEN national headquarters, Belgium) - Partner institution (training institution) Fundacio Inform (PEN national headquarters, Spain), Institut El Calamot (Belgian vocational training institution), Hogeschool West-Vlaanderen Howest (Belgian HEI), Sint-Jozef Sint-Pieter (Belgian Secondary School) - Partner companies: Numerous logistics companies in Belgium WWL Zeebrugge, Verhelst Oostende, X2O Gent, Belfrugo Sea Inves Zeebrugge, Hopp Zeebrugge, FRS Zeebrugge, VolvoGent, Transport Gheeraert Loppem, Alpro Wevelgem, Caterpillar Grimbergen, etc.
	Operating Period	- January 1, 2022 - December 31, 2023
	Operating Budget	(N/A)
	Operating Facility and Equipment (Including Online Tools)	<ul style="list-style-type: none"> - Office space (large classrooms) - Teamwork space and conference rooms - Computers, laptops, and dual monitors - Internet access - Logistics software - Virtual office tools, evaluation tools
Program	Target Groups	<ul style="list-style-type: none"> - TVET trainees in secondary schools (16-18 years) - Trainees in HEIs (over 18 years) - Job seekers - Instructors in TVET and HE
	Training Goal	<ul style="list-style-type: none"> - Develop job-based learning programs to prepare European TVET students for work in logistics companies. - Converge HE into the basic course of advanced logistics education. - Deliver support for TVET students to find employment in a logistics company. - Implement logistics training programs by applying the PE methodology to the logistics education program. - Reduce the gap between education and work by using the PE methodology.
	Preparation for Program Operation	<ul style="list-style-type: none"> - Pursue preceding research. - Establish training objectives to be achieved in an LPE (Logistics Practice Enterprise). - Establish LPE: Establish departments and tasks for each department. - Define resources needed for the LPE's operation and plans to secure such resources. - Instructor/teacher training - Develop course curriculum.
	Program	- SJP. HOWEST, CALAMOT will operate the LPE as an

	Operation	<p>educational training course.</p> <ul style="list-style-type: none"> – Training hours: Operate differently according to each training organization. E.g., Sint-Jozef Sint-Pieter operates 2 hours a week over 2 semesters – Compose a curriculum combined with theoretical education: Engage students with basic knowledge of international trade and logistics to participate in the LPE. – The LPE is like a real company with people who learn educational content/knowledge/working methods in different ways. – Theoretical education presupposes that all students acquire the same learning skills and contents, but in work, each student is assigned an appropriate task in consideration of individual differences. – Provide additional resources to LPE guidance teachers/professors for this purpose.
	Completion Criteria (Evaluation)	<ul style="list-style-type: none"> – Point accumulation: Work the same as in a real-life workplace and receive a “wage” (1 point awarded for performing 1 task and completing as many tasks as possible on the day). – Point standard: Set the number of points required for each task. – Trainees must practice each task for the required number of “points.” – Establish evaluation guidelines within the LPE, similar to real companies. – Evaluation scoring method: Final score = (sum of all tasks/evaluations) x (factors of all tasks/evaluation scores) - (tardiness penalty)
	Certification	<ul style="list-style-type: none"> – Credits and certificate

a) Overview

Due to demographic changes and the COVID-19 pandemic, the logistics sector has undergone massive changes in recent years, and the new era of so-called Logistics 4.0, derived from Industry 4.0, calls for the achievement of innovation, connectivity, and sustainability as key tasks for the future.

One of the challenges the industry faces is the lack of qualified professionals, which acts as a barrier to driving progress and improvement in logistics.

- According to DHL Trend Report 2021, *“The industry is grappling with a labor shortage and fighting a battle for talents from truck drivers and warehouse workers to supply chain planners and data scientists.”*

The expanding logistics industry requires an educational methodology combined with practical approaches and practices in European TVET.

Accordingly, this project aims to redefine the most in-demand career/job profiles in the transportation and logistics field while carrying out a new form of logistics education using the PE methodology.

Reflecting the needs of the industry, LOGIPRO, an EU Erasmus+ support program, is being conducted for two years from January 2022 to December 2023, led by the Belgian PE headquarters, Connectief vzw, which specializes in transportation and logistics.

Major institutions running specialized courses and training programs in the logistics sector are participating as partner institutions in Belgium, Spain, and Germany, which are major countries that are experiencing severe bottlenecks in the transportation and logistics sector.

Each institution has already retained partner transportation logistics companies as their business partners.

This program seeks to redefine the competence and the profile of talented professionals that transportation logistics companies need in the digital era and to play an important role in educating and fostering talented individuals with the right capabilities and skills in collaboration with companies and educational institutions.

By establishing an LPE (Logistics Practice Enterprise), it allows practice and training to be conducted in a safe environment beyond the limitations of theoretical and formal learning alone.

b) Training Objectives

Develop a curriculum that aims to narrow the gap between schools and industries and implant it into an LPE based on the concept of “AS-IS/TO-Be.”

Enable internships and field training to be implemented through LPE.

- What is “AS-Is?”: Current status of training carried out in educational institutions
- What is “TO-BE?”: Internships and real businesses carried out in the industry



Develop and run more than eight new subjects by organizationally connecting theoretical education carried out at existing educational institutions and the LPE curriculum.

- E.g., Introduction to Road Transportation (first-year students) + Intensive Course on Road Transportation (second-year students)
- E.g., Dispatcher training module

GRADTL01: Apply general theoretical knowledge of logistics in the transportation and warehouse management field and estimate the impact of other processes and links. Basic competence in logistics chains.

GRADTL02: Analyze simple logistics processes and technologies and suggest improvement plans. Participate in the implementation of improvements in consideration of efficiency, quality, safety, and environment.

GRADTL04: Manage other team members and report results according to the company's logistics goals.

GRADTL05: Independent work capacity. Act with professionalism, ethics, and social responsibility.

GRADTL06: Manage the operation of logistics and transport processes and assets, considering costs and service levels agreed with customers, in accordance with KPIs (Key Performance Indicators), applicable laws and regulations, and technical capabilities.

GRADTL07_W: Carry out road transport planning.

GRADTL08_W: Implement administrative processing and management under the policies and guidelines of the Road Transport Information Association.

GRADTL09_W: Participate in handling loading operations in road transport considering technical and safety aspects.

Prepare program graduates for smoothly entering the labor market and assist them to use the program as a preparation process for entry into graduate school or professional degrees.

Design educational and training systems in line with the “Digital Education Action Plan 2021-2027” set by the EU to realize the education of the digital generation through the experience of working in a digital virtual company with an LPE and logistics software.

c) Expected Effects

LPEs can create a TVET model that meets the requirements for collaboration among European businesses as pursued by the EU and enhances smooth business cooperation across borders.

By creating a personalized learning path for each individual, trainees can motivate themselves and

strengthen their motivation to learn.

- By classifying the departments and job levels within an LPE and establishing work manuals, trainees with a diverse range of knowledge and ability can practice as a team within the same LPE.
- The above-mentioned concerns are real-life issues facing actual companies, and therefore it is possible to develop and operate the LPE program as a virtuous cycle through the experience of trainees managing other team members and taking over responsibilities based on each student's individual capacity.

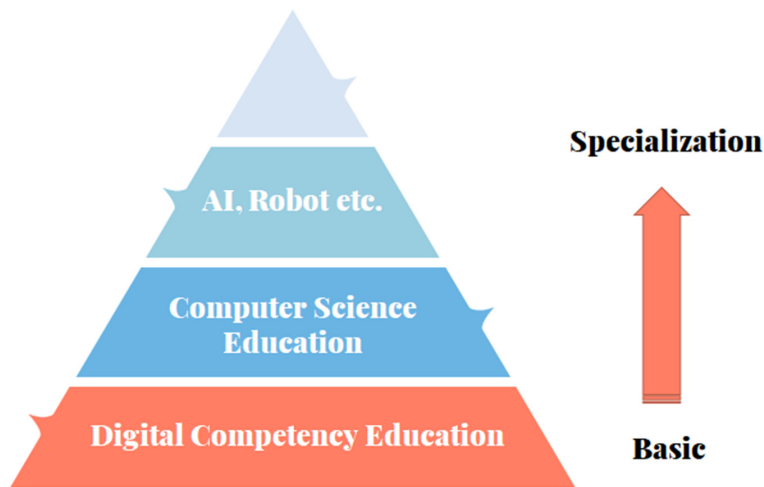
Through personalized learning, trainees can grow into self-directed professionals by recognizing the skills required for self-directed learning (cognition, metacognition, motivation, and emotion) and practicing self-regulation and discipline, in addition to expert guidance.

4.3. Digital Competency and Practice Enterprises

4.3.1. Digital Competencies to Be Applied to PEs

Characterized as the digital transformation of industries, the Fourth Industrial Revolution is further adding to the importance of software and raising the demand for cultivating software experts. However, digital competency is no less important than software in any industry. There are growing attempts to digitalize work procedures such as corporate production and management for greater efficiency and to improve the efficiency of sales and marketing by digitalizing the customer experience. Under these circumstances, many countries have recently begun to devise and implement a policy of nurturing software experts along with efforts to enhance the digital competency of the public.

<Figure 4-2> Hierarchy of Digital Competency Education



Source: Jeon, Jong-Ho, et. al. (2019:184)

Jeon, Jong-Ho, et al. (2019) conducted a study on digital competency to be applied to secondary TVET institutions. The study analyzed various existing concepts and components of digital competency as a way to identify the concept and components of digital competency that are suitable for application to secondary TVET institutions. The domains of digital competency and detailed competencies presented by the study are as follows in the table below.

<Table 4-6> Digital Competencies to Be Applied to the TVET Field

Domains of Digital Competency	Detailed Competencies	DK	DS	DA
Digital Device Literacy	Use of digital devices To operate and update digital devices and solve simple and more complicated problems related to software and hardware while using digital devices	◎	◎	△
	Awareness of digital devices To know about newly-emerging digital devices in daily life and select necessary digital devices	◎	○	◎
Digital Content Literacy	Use of digital content To use digital content in various forms in daily life or at work after browsing, searching, evaluating, selecting or organizing it	◎	◎	○
	Creation of digital content To create new and innovative content to digitally express oneself by modifying, improving, writing and editing information and content from existing knowledge systems in various formats at the multimedia level	◎	◎	○
Digital Communication and Collaboration	Communication through digital technology To make interactions through appropriate digital devices and technology and identify appropriate means and tools for digital communication in a given situation	◎	◎	○
	Sharing and collaboration through digital technology To build up resources and knowledge jointly with others by using appropriate digital tools and technology, and understand the collaborative process to this end	○	◎	◎
Digital Citizenship	Understanding the effects of digital transformation To understand the effects of digital transformation on social aspects resulting from the development of digital technology and identify a gap in one's digital competency in order to identify ways to narrow the gap	○	△	◎
	Participation in digital citizenship To engage in social welfare by using public and private digital services and explore opportunities to exercise participatory citizenship through appropriate digital technology	○	○	◎
	Compliance with digital etiquette To recognize cultural and intergenerational diversity in the digital environment and to understand and follow a code of conduct and build know-how when interacting in the digital environment	○	△	◎
	Protection of personal information and privacy To protect oneself and others from the infringement of personal information and privacy in the digital environment and understand ways to safely handle personally identifiable information	○	△	◎

	Understanding copyright and license To understand ways to apply copyright and license to data, information and digital content	○	△	◎
	Awareness of new digital crimes To be aware of and sensitive to the emergence of new digital crimes in line with the digital social transformation	○	△	◎
Digital Problem-solving	Digital problem-solving To be aware of issues arising in the digital environment, specifically define the problem and seek and apply solutions to the problem after collecting and analyzing necessary data	◎	◎	○
	Computational thinking – Data collection and pattern recognition: Collecting appropriate data to understand the meaning of data and find patterns within – Abstraction: Breaking down a problem into easily understandable parts to disregard irrelevant details and bring together relevant and useful details, thus focusing on the main idea in order to reduce complexity – Algorithm design and programming: Designing precisely-defined stages to solve problems that can be applied to plan, develop and operate a set of instructions in a programming language understandable by the computing system	◎	◎	△
Digital Job Literacy	Recognizing the needs for professional digital competency To understand which digital tools and skills are required in the field of work related to one's major	○	○	◎
	Developing professional digital competency To proactively learn and practice ways to use digital tools and digital skills required in the field of work related to one's major and put it into practice	○	◎	◎
	Understanding the effects of Industry 4.0 on the workplace To understand the effects of core technologies ⁶ of Industry 4.0 on career fields related to one's major and the phenomenon of convergence with other career fields	◎	◎	◎

DK: digital knowledge, DS: digital skills, DA: digital attitudes

◎: Strong ○: Average △: Weak

Source: Jeon, Jong-Ho, et al. (2019:116-118)

The table below outlines some of the above-mentioned digital competencies that are suitable for application to the operation process for work experience PEs.

⁶ These refer to artificial intelligence, blockchain, big data, cloud computing, machine learning, robotics, drones, autonomous driving, Internet of Things (IoT), nanotechnology, genetics and biotechnology, advanced manufacturing, 3D printing, etc.

<Table 4-7> Digital Competencies to Be Applied to PEs

Domains of Digital Competency	Detailed Competencies	DK	DS	DA
Digital Content Literacy	Use of digital content To use digital content in various forms in daily life or at work after browsing, searching, evaluating, selecting or organizing it	◎	◎	○
	Creation of digital content To create new and innovative content to digitally express oneself by modifying, improving, writing and editing information and content from existing knowledge systems in various formats at the multimedia level	◎	◎	○
Digital Communication and Collaboration	Communication through digital technology To make interactions through appropriate digital devices and technology and identify appropriate means and tools for digital communication in a given situation	◎	◎	○
	Sharing and collaboration through digital technology To build up resources and knowledge jointly with others by using appropriate digital tools and technology, and understand the collaborative process to this end	○	◎	◎
Digital Problem-solving	Digital problem-solving To be aware of issues arising in the digital environment, specifically define the problem and seek and apply solutions to the problem after collecting and analyzing necessary data	◎	◎	○
	Recognizing the needs for professional digital competency To understand which digital tools and skills are required in the field of work related to one's major	○	○	◎
Digital Literacy	Developing professional digital competency To proactively learn and practice ways to use digital tools and digital skills required in the field of work related to one's major and put it into practice	○	◎	◎
	Understanding the effects of Industry 4.0 on the workplace To understand the effects of core technologies ⁷ of Industry 4.0 on career fields related to one's major and the phenomenon of convergence with other career fields	◎	◎	◎

DK: digital knowledge, DS: digital skills, DA: digital attitudes

◎: Strong ○: Average △: Weak

Source: Jeon, Jong-Ho, et al. (2019:116-118). Reorganized by the authors

In order to understand the current situation of the content actually covered in the course to teach the above-mentioned digital competencies, this study analyzed the content of the digital learning

⁷ These refer to artificial intelligence, blockchain, big data, cloud computing, machine learning, robotics, drones, autonomous driving, Internet of Things (IoT), nanotechnology, genetics and biotechnology, advanced manufacturing, 3D printing, etc.

center project (for enhancing digital competency, website: 디지털배움터.kr). The Korean government has recently implemented the digital learning center project as part of its efforts to develop digital competency among the public. This study analyzed the ICT utilization program for youths preparing for employment among the project's programs, in which every local government in Korea has participated since 2021. Its main educational content is shown in the table below.

<Table 4-8> Status of Major ICT Utilization in Digital Learning Centers in Korea

Digital Learning Center – Main Education Content (for Job Seekers and Entrepreneurs)
Creation of presentation materials (PPT/ Miricanvas), creation of documents (Hangul, Word), statistical processing (Excel), and multimedia editing (Pixlr, Photopia, Kinemaster, etc.)
Social media (Twitter, Facebook, YouTube, Kakao, Telegram, Band), translation apps, collaboration tools (Notion, JANDI), Google Classroom, and Google Workspace
App creation (Naver modoo, App Inventor) and online marketing

4.3.2. Status of ICT Utilization in PEs

This study aimed to increase the applicability of its findings by examining the status of ICT that is actually applicable to the operating model for digital-based PEs. To this end, the status of ICT that is currently used in PEs (including PEN Worldwide) was summarized along with the inclusion of the cases of PE operations shown in Section 2.

The status of ICT utilization was analyzed according to the procedure of PE operation. It appears that most PEs used global collaboration tools (including Google), in addition to Zoom and social media platforms.

<Table 4-9> Status of ICT Utilization in PEs

Division		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Category (5)	Subcategory (30)	30	30	30	8	3	3	3	2	8	7	22	6	4	21	30
New Employee Registration	Orientation	1	1	1				1							1	1
	Hybrid Internship Onboarding	1	1	1	1											1
Basic Job Skills	New Employee Workshop (1)- Digital Working Tools	1	1	1												1
	New Employee Workshop (2)- Team building	1	1	1												1
	New Employee Workshop (3)- Communication and Facilitation	1	1	1												1
	New Employee Workshop (4)- Business Meetings	1	1	1								1				1

	New Employee Workshop (5)- Business Writing	1	1	1								1				1
	Understanding My Company	1	1	1												1
	Understanding My Position	1	1	1								1				1
	Job Placement Interview	1	1	1								1				1
	Building Ground Rules	1	1	1								1				1
	Building an Organization	1	1	1						1		1	1			1
	Work Planning	1	1	1								1				1
Work Experience by Working Departments	Accounting and Finance	1	1	1	1							1				1
	Administration	1	1	1								1				1
	HR	1	1	1	1			1	1	1	1	1	1	1	6	1
	R&D/Production	1	1	1	1							1				1
	Sales and Marketing	1	1	1	1	1	1	1		1	1	1	1	1	6	1
	Digital Marketing	1	1	1	1	1	1	1		1	1	1	1	1	2	1
	New Business Development	1	1	1								1				1
	Customer Service	1	1	1								1				1
	Design	1	1	1					1	1	1			1	2	1
	Intellectual Property	1	1	1								1				1
	ESG	1	1	1								1				1
Report and Presentation	Trade Show and Exhibition	1	1	1	1	1	1			1	1	1	1		4	1
	Interim Report & Presentation	1	1	1						1	1	1				1
Career Development	Final Report & Presentation	1	1	1						1	1	1				1
	Resume and Career Portfolio	1	1	1				1	1			1	1			1
	Time Management	1	1	1	1											1
	Project Management	1	1	1												1

Note: ① Google Workspace ② Google Classroom ③ PEN Bank ④ Collaboration tools (PnP Soft) ⑤ PEN Webshop (Marketplace) ⑥ PEN Online Exhibition ⑦ Digital leadership self-assessment ⑧ Digital Entrepreneur Academy ⑨ Homepage creation tools (WIX. etc.) ⑩ Miricanvas (presentation/brochure-making tool) ⑪ Yesform (website for document templates) ⑫ Translation apps ⑬ YouTube ⑭ Social mmedia (Instagram, Facebook, KakaoTalk, Slack, WeChat, WhatsApp) ⑮ Zoom

Since the online collaboration tools provided by Google and Microsoft are the most popular software in the world, learning to use these tools in employment preparation courses appears to be a valid goal. In addition to ICT and software used in existing PEs, it is desirable to select and learn software, particularly the most commonly used, in consideration of the characteristics of each country and industry. However, it is also necessary to prepare to use the other software outlined above, as they are likely to be used in the context of participating in a network of PEs operating all over the world.

Based on digital competencies applicable to PEs and analysis results of status of ICT utilization in the PE operation process, the types of digital competency education that are appropriate in the PE operation process are shown in the table below.

<Table 4-10> PE Operation (based on Category) and Digital Competencies

Category	Digital Content Literacy	Digital Communication and Collaboration	Digital Problem-solving	Digital Job Literacy
New Employee Registration				
Basic Job Skills		◎		○
Work Experience by Working Departments	○	○	◎	
Report and Presentation	◎	○		
Career Development			○	◎

◎: Strong ○: Average △: Weak

Chapter 5. Utilization Plan for Digital Competency-based Work Experience PEs in Indonesia

5.1. Utilization Plan

5.1.1. Overview of Proposal

[Purpose of Utilization] As discussed in previous chapters, PEs can generally achieve operational outcomes for the purpose of entrepreneurship/startup education and job training. This study proposes a future-oriented model of PEs to increase the employment outcomes (workers desired by companies, workers equipped with employment competency, etc.), including two specific objectives as specified below.

- (1) First, the TVET sector must meet the demand of companies for workers equipped with digital competency in line with digital transformation, remote work competency in response to social changes caused by COVID-19, and prior work experience.
- (2) Second, high-quality TVET programs must be able to operate under non-face-to-face conditions such as COVID-19.

[Applicable Fields] Since a PE is a training enterprise that operates like a real business and offers experience in working in various teams and executing business projects, the recommended business scale and industry field for a PE are as follows.

- (1) Recommended business scale: Companies composed of several teams such as planning, human resources, and general affairs.
- (2) Recommended industrial fields: New industries (artificial intelligence, biotechnology, automobiles, etc.), fields in which on-the-job training is difficult, etc.

[Types of Utilization] Three types of utilization are proposed, including categories in line with the classification of TVET institutions (secondary and higher) in Indonesia, in addition to categories for general job seekers.

<Table 5-1> Utilization Types of PEs (draft)

Operating Institution	Operation Type	Targets	(Recommended) Training Time/Period
Secondary	Curriculum (subject)	Students of secondary	204 hours (6 hours per week) / second-

TVET Institutions		TVET institutions	or third-year students
	After-school/club activities		204 hours (6 hours per week) / second- or third-year students
	During vacation		120 hours (4 weeks) / second- or third-year students
Higher TVET Institutions	Curriculum (for each subject)	Students of higher TVET institutions	30-45 hours (2-3 credits)
	Seasonal semester		45-160 hours (4 weeks)
	Extracurricular program		30-50 hours
Companies	Linked with school field practice	Students of higher vocational education institutions	160 hours (linked to systems, such as school filed training)
	Business-led	General adults (job seekers)	160 hours or above (according to corporate design programs)

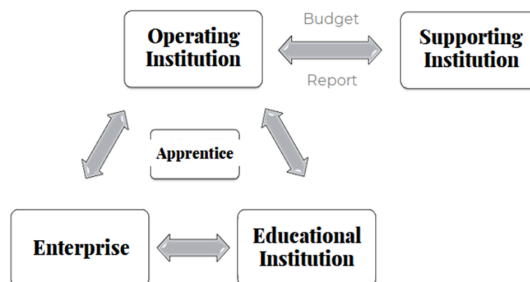
Note: An appropriate number of persons for each PE is approximately 20.

5.1.2. Detailed Proposal

1) Operational Organization

An operational organization involves at least three operating entities—an operating institution, a company, and an educational institution—that each performs a necessary given function to operate a program.

<Figure 5-1> Operating Organizations of PEs (draft)



The operating institution is generally a TVET institution, while a supporting institution is in charge of providing financial support necessary for the operation of programs, while entities such as the government, local governments, companies, and schools may also participate as support institutions.

The main roles of the operating institution, the participating company, and the educational institution as operating entities are as follows.

<Table 5-2> Main Roles of Operating Organizations of PEs (draft)

Operating Entities	Operating Institution	Participating Company	Educational Institution
Main Roles	<ul style="list-style-type: none"> - Overall planning and operation of programs - Budget management and staffing - Recruitment of trainees and follow-up management - Promotion and marketing of programs 	<ul style="list-style-type: none"> - Participation and consultation of overall program design and planning - Work design by department - Design of project tasks - Development and provision of educational content - Mentoring and feedback on jobs and tasks - Provision of office space, materials and equipment 	<ul style="list-style-type: none"> - Overall program design and planning - Training of facilitators (coaches) - Recruitment of participating companies and instructors - Management of training schedule and content - Management of trainees - Planning and execution of related events - Investigation of outcomes and preparation of reports

The operating institution is in charge of overall operation and management for the smooth execution of programs, including budget management, personnel composition, recruitment of trainees, and promotion and marketing of programs.

Participating companies design the actual training, such as the tasks handled by each department and in each project in order to foster human resources needed in relevant industry fields, while being in charge of mentoring and feedback with regard to such details.

Educational institutions are in charge of designing and planning all programs and curricula, educating and training facilitators (coaches) who guide practice, and managing the specific process and content for trainees.

The roles of each operating entity may change depending on the nature and purpose of the program.

2) Operation Procedure

The operation procedure consists of four phases: promotion and recruitment, advance training, PE operation, and follow-up management.

[Promotion and Recruitment Phase] Under the supervision of the operating institution, a preliminary survey is conducted on companies and practice trainees in select industries where PEs will operate, in order to establish an operation plan for PEs and recruit trainees.

[Advance Training Phase] As part of the preparation process for the operation of a PE, this phase helps improve trainees' understanding on PEs and provides them with the basic knowledge necessary to operate a PE, as well as collaborative opportunities and skills to utilize work-related tools. In cases where it is difficult to organize an advance training, education content can be incorporated into the operation of a PE and taught to new employees.

[PE Operation Phase] This is the main course of the PE program, under which trainees operate a PE that is modeled after an actual company and learn about entrepreneurship and business management, as well as the duties and interconnectedness of each position, the method of work performance and the digital competency required to this end.

[Follow-up Management Phase] Centered around the operating institution, support is provided for graduates to acquire the elements and capabilities necessary in the process of actually starting up a business or seeking employment, such as the creation of portfolios, preparation of resumes and cover letters, and practice of the interview.

3) Operating Programs

The important element of operating programs is the program's total operating duration. In Korea, secondary TVET institutions assign operating times of 120-204 hours, while higher vocational education institutions assign at least 160 hours (based on the field practice system / 8 hours per day x 4 weeks). For company-led programs, the total operating time may be determined freely. In Indonesia, it is necessary for each operating institution to properly adjust the operating hours according to the type of operation, and accordingly design specific programs.

The table below outlines the content of an operating program, the proportion of operating hours and operation methods for the "advance training," "PE operation," and "follow-up management" phases among the operating procedures described above. The advance training phase provides

information for understanding and learning about the specific type of PE that the trainee belongs to, the departments that it consists of, the ways in which tasks are assigned and performed, the tools that are needed for the work, and how they are used. The work practice for each department and project practice comprise the core content of the entire practice program, which allows trainees in each department to actually operate the PE and learn the characteristics and work methods of each department as they are performed in an actual company. Career management is a process that links the course and practice with actual entrepreneurship or employment, under which trainees create their portfolio based on the details of practice, and are also provided practical assistance in preparing the necessary elements for entrepreneurship or employment.

<Table 5-3> Details of PE Operating Programs (draft)

Classification	Advance Training	Work by Department and Project Practice	Career Management
Description	<ul style="list-style-type: none"> – Basic training for new employees – Skills for operating work-related tools 	<ul style="list-style-type: none"> – Organizational structure and department placement – Work by department and execution of projects – Reporting of results 	<ul style="list-style-type: none"> – Capacity-building for employment and entrepreneurship – Support for employment and entrepreneurship
Content	<ul style="list-style-type: none"> – Understanding of PEs – Understanding of the basic work of each department – (Digital competency education) Tools for online collaboration and work 	<ul style="list-style-type: none"> – Establishment of a corporate framework – Establishment and implementation of work plans for each department – Performance of project tasks – Reporting of results (interim and final) 	<ul style="list-style-type: none"> – Certificate of completion – Creation of portfolios – Resume and cover letter – Interview

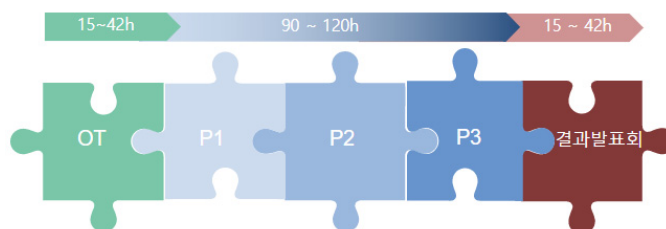
In terms of the operation methods, it is desirable for a large portion of the education for new employees to be conducted online, mainly as individual assignments, whereas departmental duties and project practice should mainly be provided offline since they require collaboration. The proportion of operating hours and operation methods may be adjusted flexibly according to circumstances and conditions.

<Table 5-4> Proportion and Operation Methods of PE Operating Programs (draft)

Operating Procedure	Percentage (%)	Operation Methods (%)			
		Offline	Online	Online/Offline Hybrid	Subtotal
Advance Training	25	20	50	30	100
PE Operation	65	50	30	20	100
Career Management	10	30	30	40	100
Subtotal	100				

※ Example (secondary TVET institution programs)

<Figure 5-2> Example of PE Operating Programs (Secondary TVET Institution)



The detailed operating program is specifically structured to allow trainees to experience work in an actual company as closely and practically as possible, and consists of modules that can be added or removed depending on the operating duration.

It is important in performing specific tasks to ensure that trainees learn that the tasks of each department are interconnected, not separate. For example, since a company's primary purpose is to pursue profit, once a product is developed, the marketing and sales departments establish a marketing strategy to maximize profits; the human resources department conducts training for capacity-building and establishes a performance-based incentive system; and the finance accounting department establishes a relevant budget. As such, the program should be designed to allow trainees to experience the interconnectivity between each and other department.

<Table 5-5> Detailed PE Operating Programs (draft)

Classification	Description	Details	Percentage (%)
Advance Training (25%)	Orientation	New employee registration, payroll account creation, agile office manual education, etc.	20
	Education in the relevant industry	Understanding of the relevant industry	20
	(Digital competency education) Online collaboration and working tools	Google and MS online collaboration tools, PEN Bank, Zoom, social media, etc.	30
	Meeting and facilitation skills	Preparation, progress, and follow-up of meetings, facilitation methodology	15
	Business writing	Reports, emails, proposals, etc.	10
	Department application	Submission of department applications	5
			100
Work by Department and Project Practice (65%)	Work by department	Establishment and execution of task plans by department	65
	Execution of project tasks	Execution of special tasks assigned by the participating company	15
	Interim report	Interim evaluation and feedback	10
	Final report	Final evaluation and completion ceremony	10
			100
Career Management (10%)	Career development	Job description, resume, cover letter, online job application practice, etc.	40
	Preparation of interviews	One-minute self-introduction, simulated interview, etc.	30
	Presentation skills	Presentation planning, skills, etc.	20

	Time management	Decision on task priority, instructions on writing a planner	10
			100

For “(digital competency education) online collaboration and working tools” in advance training, specific educational content is designed and offered mainly based on the digital tools that are actually utilized by companies and schools related to Indonesia, in consideration of specific competencies in the areas of “digital content literacy,” “digital communication and cooperation,” “digital problem solving,” and “digital job literacy.” Digital tools can be reorganized and operated focusing on software mainly used by Indonesian schools and companies, in addition to the software analyzed in the section on the current status of PE utilization.

4) Operating Infrastructure

Office space and equipment are the basic essential components of the operating infrastructure. The office space (a space where 15-20 people can work at the same time) needs to be structured to resemble the actual office space of a company as closely as possible, which can help improve liveliness and adaptability to work. Equipment consists of furniture and fixtures that workers would use in the performance of their job in the office space of an actual company, such as desks, chairs, conference tables, and computers.

It is most appropriate to accommodate the operating infrastructure in the operating institution (a separate space of a TVET institution or the company), but if unavoidable, the operating infrastructure can be housed in a separate space in consideration of the movement route of learners.

The budget for the operating infrastructure must be borne by a supporting institution or an operating entity (an educational training institution or a company).

5) Education Evaluation

Points are awarded for essential work that must be performed by each individual or department, and it is deemed to complete them when a total of point surpasses a standard number set for each stage.

The evaluation criteria is established according to the standard of performance of the task, based on which the evaluation takes place.

This must be discussed and shared in advance with regard to the evaluation entities (such as instructors, facilitators, and corporate personnel).

6) Considerations

[Sharing the Same Level of Operational Goals] The operating entity and trainees of the PE program must share a sufficiently similar purpose (an understanding of the PE and the final goal to be achieved through it).

[Participating Companies] It is necessary to fully review whether the company has the right to participate and has a mindset to participate in the practice.

[Participating Students] Committing to the premise that a PE is a real business, as opposed to a virtual or simulated company, trainees are guided to actively plan assigned duties and find optimal means of performance, rather than being satisfied with simply achieving the duties.

[Education and Cultivation of Facilitators] Facilitators are required to complete an approximately 50-hour training course (certificate granted). If a training course targets instructors of a TVET institution, it is possible to operate a sustainable PE for the institution. Alternatively, it is also possible to secure and utilize a separate budget (personnel expense) for those who have completed a facilitator training course. It is necessary to foster facilitators both inside and outside of the TVET institution, and it is appropriate to designate and operate a separated institution dedicated to training courses (Chamber of Commerce, TVET institute, PEs, etc.). The content of the 50-hour facilitator training course is shown below.

<Table 5-6> Training Course for PE Facilitators (Coaches) (draft)

Round	Time	Main Content
1-2	1 hours	Overview of the PE and the PE program
	9 hours	PE program teaching methodology (hybrid practice environment) 1. Smart working and online collaboration tools 2. Google Drive and applications 3. Opening and utilization of Google Classroom 4. Zoom for video conferencing
3-4	10 hours	PE program operating practice (registration, brief sessions and evaluation) 1. The PE and PE Program ● Understanding of the PE and the PE ecosystem ● Understanding of the PE program ● Composition of the PE program ● Understanding of the PE facilitation 2. PE work and recruitment ● Understanding of work under the PE program

		<ul style="list-style-type: none"> ● Recruitment and department placement 3. PE practice – Sales and marketing 4. PE practice – HR and administration 5. PE practice – Purchasing and logistics 6. PE practice – Accounting and finance 7. Practice environment of PENapps 8. PE evaluation and briefing sessions 9. Career guidance for PE trainees
5-6	10 hours	<p>PE program teaching methodology (coaching and facilitation)</p> <ol style="list-style-type: none"> 1. PE coaching conversations <ul style="list-style-type: none"> ● Coaching for PEs ● Listening skills for PEs ● Questions for PEs ● Personal coaching conversation models ● Feedback coaching conversations 2. PE group coaching <ul style="list-style-type: none"> ● PE group coaching and PE team coaching ● Key questions for PE group coaching ● Operation of PE group coaching
7-8	10 hours	<p>PE program operation practice (training company program for entrepreneurship experience)</p> <ol style="list-style-type: none"> 1. Business items and team building 2. Design thinking and value proposition 3. Establishment of business models 4. Demand survey 5. Presentation and feedback
9-10	10 hours	<p>PE program operating practice (training company program for work experience)</p> <ol style="list-style-type: none"> 1. Understanding of the PE work experience program 2. Roles and guidance methods of facilitators 3. Functions of the program operation framework 4. Work experience practice and guidance cases 5. Events

5.2. Pilot Operations Roadmap

5.2.1. Pilot Operations for 2023

In 2022, the operation plan for digital competency-based work experience PEs was formulated as a research project that proposed the direction and details of the pilot operations for 2023.

In 2023, the first year of applying the above research results, Korea (KRIVET) will lead the operation of the PE, allowing the Indonesian personnel to participate in the operation and learn the procedures and methods necessary to run the PE. The detailed operation methods will be reflected in the establishment of a business plan for the pilot operation in 2023 through consultation with the Indonesian personnel. In addition, a preliminary plan for 2023 will be established to allow Indonesia to take a leadership role in the PE operations, supported (through consultation) by Korea (KRIVET) in 2024.

[Supporting Institutions] The budget necessary for pilot operations can be allocated from the budget of related organizations in Korea. If possible, further discussions will be needed with regard to the support for relevant organizations, such as the Indonesian Ministry of Industry, and for participating companies (infrastructure).

[Operating Institution] For the pilot operation in 2023, the operating institution can either be selected among secondary TVET institutions and higher TVET institutions (polytechnics), or be corporate-led in agreement with a specific company.

[Training for Operators and Facilitators] It is necessary to train Indonesian personnel and facilitators for operating PEs. To this end, it is being considered to apply a combination of on-site training provided in Indonesia (open to many participants) and the existing PE training taking place in Korea (open to fewer participants).

[Pilot Operation Industries] Automobile, biotechnology, chemical, textiles, tourism, etc.

5.2.2. Pilot Operations for 2024

In 2024, Indonesia will lead the pilot operations, with Korea (KRIVET) participating in a supporting position (consultation).

Therefore, starting in 2024, Indonesia will determine the composition of the operating organization, including the operating institution, the educational institution, and the participating company, as well as the operating plan, then take a leading role in the operation of a real PE program from the recruitment of trainees to career management, based on the operating procedure.

Following the stable operation of the PE led by Indonesia in 2024, the pilot operation will spread to other areas after 2025, and also expand the operation program using networks with Korea

(linkage with other Asian regions, PEN utilization, etc.).

[Supporting Institution] The budget necessary for the pilot operation is supported by relevant agencies such as the Indonesian Ministry of Industry and participating companies (infrastructure). Korea (KRIVET) provides training for the Indonesian personnel and local consultation.

Abbreviation

AIHRD	Agency for Industrial Human Resource Development
BLK	Balai Latihan Kerja (Vocational Training Center)
BNSP	Badan Nasional Sertifikasi Profesi (National Agency for Profession Certification)
BPS	Badan Pusat Statistik (Statistics Indonesia)
KKNI	Kerangka Kualifikasi Nasional Indonesia (Indonesia National Qualifications Framework)
MoECRT	Ministry of Education, Culture, Research and Technology (Kementerian Pendidikan, Kebudayaan, Riset dan Teknologi)
MoI	Ministry of Industry (Kementerian Perindustrian)
MoM	Ministry of Manpower (Kementerian Ketenagakerjaan)
SKKNI	Standar Kompetensi Kerja Nasional Indonesia (Indonesia National Work Competency Standards)
SD	Sekolah Dasar (Primary/Elementary School)
SMP	Sekolah Menengah Pertama (Junior high school)
SMA	Sekolah Menengah Atas (Senior high school)
SMK	Sekolah Menengah Kejuruan (Vocational high school)

References

Books

AIHRD(2022), Technical Vocational Education and Training (TVET) in Indonesia. *Presentation Paper for “2022 Korea-Indonesia Joint Workshop for Industrial Innovation”*

COFEP & Project Consortium Partners (2002). *Project Result 2 - Implementation Guide and Materials*

COFEP & Project Consortium Partners (2022). *Project Result 1- Benchmarking and Analysis Report*

Elisabeth Riebenbauer et al. (2022). *HEIPNET - Manual for Practice Enterprise Implementation in Higher Education Institutions*, 44-50

European Union (2019). *IMPEET - Handbook for Practice Enterprise Teachers in Secondary Education (Germany, Italy, Lithuania)*, 5, 22-26

European Union (2019). *IMPEET - Practice Enterprise's Competencies Frameworks (Germany, Italy, Lithuania)*, 6-8

European Union (2020). *IMPEET - Practice Enterprise Model for Students Aged 12-15 (Germany, Italy, Lithuania)*, 4-6, 16-18, 25

Hristo Mavrudiev, Rima Baciulyte (2022). *HEIPNET - Recommendations for Practice Enterprise Curriculum/Module Improvement*, 13-21, 37-38, 57

Induk University Employment and Startup Support Center (2021), *Outcomes Report on an Entrepreneurship Practicum for University Students* (대학생 창업체험 현장실습 결과보고서)

Jeju Girls' Commercial High School and KoreaPEN (2019), *Outcomes Report of the Model Venture Program* (모의벤처프로그램 결과보고서) (Supported by Jeju Self-Governing Provincial Office of Education, Operated by Jeju Girls' Commercial High School, Trained by KoreaPEN)

Jeon, Jong-Ho, Lee, Chul Hyun, Lee, Yeong-min, Lee, Nam-cheol, and Oh, Gwan-taek (2019), *A Study on the Digital Competency Education of Vocational High Schools for the Fourth Industrial Revolution* (4차 산업혁명 시대에 대비한 직업계고 디지털역량 교육 연구), Korea Research Institute for Vocational Education & Training

KoreaPEN (2019), *A Proposal for a Model Venture Program* (모의벤처프로그램 제안서)

KoreaPEN (2020), *A Proposal for an Entrepreneurship Practicum for University Students* (대학생 창업체험 현장실습 제안서)

KoreaPEN (2022), *Program Plans and Job Manual for Each Role in Practice Enterprises for a Youth-Friendly Company's ESG Support Project Program*, “Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs” (청년 진화형 기업 ESG 지원사업프로그램 “모의기업 직무체험을 통한 바이오헬스케어 비즈니스 인재양성 프로그램” 프로그램 기획안과 실습기업 직무별 업무 매뉴얼)

KoreaPEN (2022), *Video Collection of Online Mentoring Sessions for a Youth-Friendly Company's ESG Support Project Program*, “Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs” (청년

진화형 기업 ESG 지원사업프로그램 “모의기업 직무체험을 통한 바이오헬스케어 비즈니스 인재양성 프로그램” 온라인 멘토링 세션 동영상 모음)

KRIVET(2020). *ASEAN Team Project – Component 1: Enhancing the Competitiveness of HR Through Responsive TVET Curriculum Supported by Involvement of Industries and Labor Market Information*. Country Report: Indonesia.

Kunsan National University (person in charge: Jin Jeong-il) (2014-2019), *A Planning for Kunsan National University Practice Enterprise Program* (군산대학교 실습기업 프로그램 기획안)

Kunsan National University LINK+ Incubation Project Team (2013-2019), *A Proposal for Kunsan National University Practice Enterprise Program* (군산대학교 실습기업 프로그램 제안서)

Kunsan National University LINK+ Incubation Project Team (2014-2019), *A Result Report on Kunsan National University Practice Enterprise Program* (군산대학교 실습기업 프로그램 결과보고서)

Kunsan National University, KoreaPEN (2014), *Outcomes Report on the Pilot Project of the High School Practice Enterprise Program in Chungcheongnam-do and Jeollabuk-do* (충남·전북지역 고등학교 실습기업 프로그램 시범사업 결과보고서) (supported by Ministry of Education, et al.)

Ministry of Education (2021a), *2021 Operating Regulation Manual on On-the-job Training Semesters for College and University Students* (2021년 대학생 현장실습학기제 운영규정 매뉴얼)

Ministry of Education (2021b), *Survey Report on University-Industry Collaboration Activities* (대학 산학협력활동 조사보고서)

Ministry of Education and Korea Research Institute for Vocational Education & Training (2020), “On-the-job Training Operating Manual for Vocational High Schools (직업계고 현장실습 운영 매뉴얼)” (March, 2020), 8

Ministry of Education, Korea Student Aid Foundation, and Korea Research Institute for Vocational Education & Training (2021), 10-13: Reorganized by the researchers

Sustainability Management Foundation and KoreaPEN (2022), *A Proposal for a Youth-Friendly Company's ESG Support Project Program, “Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs”* (청년 진화형 기업 ESG 지원사업프로그램 “모의기업 직무체험을 통한 바이오헬스케어 비즈니스 인재양성 프로그램” 제안서)

Sustainability Management Foundation and KoreaPEN (2022), *An Operational Report on a Youth-Friendly Company's ESG Support Project Program, “Program to Develop Young Professionals in Pharmaceuticals and Bio Through PEs”* (청년 진화형 기업 ESG 지원사업 프로그램 “모의기업 직무체험을 통한 바이오헬스케어 비즈니스 인재양성 프로그램” 운영보고서)

UNESCO-UNEVOC(2020). *TVET Country Profile: Indonesia*.

Articles and Theses

AIHRD Ministry of Industry. “TVET in Indonesia”

Choi Soon Sik (2015), “A Study on the Effective Strategy to Activate Field Training Internships: Focused on LINC Business of a University in Chungcheong-do (현장실습 운영활성화를 위한 효율적 방안에 관한 연구: 충청지역 A대학교의 산학협력선도대학(LINC) 사업을 중심으로),” *Korean Review of Corporation Management*, Vol. 6, No. 1, 151-175

Jang, Hoo Eun, Heo, Sun Young, and Lee, Jong-Ho (2017), “The Current Status of Co-operative Education Programs in Korean Universities and Implications for Government Policy (대학의 현장실습 운영 실태 및 정책 과제),” *Journal of Korea Academia-Industrial Cooperation Society (JKAIS)*, Vol. 18, No. 2, 493-500

Kim, Chun-Shik (2019), “A Study on the University Start-up Activation Plan Through Co-op Education: Focused on the Development of a University Education Model Linked to Field Practices (코업 교육을 통한 창업 활성화 방안 연구: 현장실습연계형 대학 교육 모델 개발을 중심으로),” *Journal of Information Technology Applications Management*, Vol. 26, No. 3, 61-80

Kim, Su-Hee and Jeong, Kwangsoon (2011), “Exploration of Situated Learning for an Understanding of Classroom Instruction (교실수업 이해를 위한 상황학습론 탐색),” *The Journal of Elementary Education Studies*, Vol. 18, No. 1, 23-36

Lee, Hyunjeong, Jeon, Jong-Ho, and Kim, Ju-yeong (2007), “An Exploration of the Applicability of Practice Firms as a Model for Virtual Learning (가상학습 모델로서 실습기업의 적용가능성 탐색),” *Andragogy Today*, Vol. 10, No. 1, The Adult and Continuing Education of Korea

Ministry of Industry of Republic of Indonesia (2018), “Industrial Revolution 4.0 of Indonesia”

Ministry of Industry of Republic of Indonesia (2021), “Kick-off Meeting Triangular Cooperation Government of Indonesia, GIZ, and Tanzania”

Nam, Hwa-seong, et al., “The Analysis on the Effectiveness of Industry Professional Practice (IPP) Programs: Focused on the Key Competencies of K-University (장기현장실습 프로그램 효과 분석 – K대학교 핵심역량을 중심으로),” *Korean Journal of Youth Studies*, Vol. 25, No. 3 (March 2018), 129-157

Nils Peschke, “Request to Assist on Data Collection.” Received by Tuya Shishmishig, September 23, 2022. Email interview

Presidential Regulation of the Republic of Indonesia number 32 of 2021 concerning Amendment to Presidential Regulation Number 68 of 2019 concerning the Organization of the State Ministry.

Sohn, Gahyun and Park, Jeong-Seon (2020), “A Study on Field Education Experiences for Social Welfare Practicum of Cyber University Students (사이버대학교 학생의 사회복지현장실습 교육 경험에 관한 연구),” *Korean Journal of Social Welfare Education*, September 30, 2020, Vol. 51, 1-30

Online Sources

ADB (Asian Development Bank), *Key Indicators for Asia and the Pacific 2022*, <https://kidb.adb.org>

Digital Learning Center. <https://www.xn--2z1bw8k1pjz5ccumkb.kr>/Accessed on:

KARIC (Korea Academic Recognition Information Center). Accessed on October, 19, 2022
<https://www.karic.kr/com/cmm/EgovContentView.do?menuNo=9110101000>

KEDI (Korean Educational Development Institute) (2022), *Guidelines and Its Summary (Brochure) of Vocational High School Graduate Employment Statistics Survey* <https://guess.kedi.re.kr/board/guidebook.do>

KESS (Korean Education Statistics Service) of KEDI (Korean Educational Development Institute),. Accessed on October 19, 2022 <https://school.kedi.re.kr/index.do>

Nils Peschke (2020). *PE Concept and the Role of Partnerships, Projects and Partners*, 2-4. www.szut.de

PEN Worldwide (penworldwide.org). Accessed on August 10, 2022