บทความวิจัย (Research Article)

The Development Needs of Workplace Instructors
for Dual Vocational Education (DVE)

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Abstract

Thailand had a limitation on the quality of its workforce. Studies had shown that the highest-demanded middle-level skilled labor quality did not meet market requirements. To confront this problem, one strategy companies use was partnering in dual vocational education (DVE) and training vocational students in practical skills. However, employees who trained students in these programs were initially not teachers or education specialists. Therefore, there might be some missing areas in their competency development needed to promote students' training outcomes. This study aimed to explore the competency development needs of workplace instructors under a public vocational college network in Bangkok, Thailand. The studied competencies were based on the dual vocational education concept and were grouped into four domains namely, occupational practice, attitude, DVE management, and learning management. The competency development needs were explored by comparing

current and desirable states of development from a survey questionnaire from 384 workplace instructors and 18 college supervisors. The study revealed the highest need to develop competency in the Occupational Practice domain ($PNI_{modified}$ = 0.4977) which was to apply professional knowledge and skill into practice. The second-highest need was to develop competencies in the Learning Management domain ($PNI_{modified}$ = 0.4950) which were to measure and evaluate learning and to analyze trainees. Although further research was required to identify suitable training methods, findings suggested companies support workplace instructors for acquiring more pedagogical skills and applying new knowledge and technologies into practice.

Keywords: Competency, Development Needs, Dual Vocational Education, Training, Workplace Instructors

Introduction

At a time when the future of work is more unpredictable due to disruptive changes and consequences of the Fourth Industrial Revolution, the development of labor with the necessary skill sets can enhance productivity and prosperity. (Leopold, Ratcheva, & Zahidi, 2016) The Thai government was aware that the quality of its people could contribute to national strategic goals, so when it formulated strategies for strengthening the economy and underpinning sustainable competitiveness, it simultaneously launched strategies for strengthening the potential of human capital. (Office of the National Economic and Social Development Board, 2017) Thus, it was better to be prepared for its human capital when the government has steadily directed mega projects such as Eastern Economic Corridor (EEC) zone or High-Speed Rail Linking Three Airports (Chuchottaworn, 2018). However, Thailand has some limitations on the quantity and quality of its workforce. The Asian Development Bank (2015) study

showed an inadequately educated Thai workforce and insufficient innovation capacity. Other studies showed that middle-level skilled labor, primarily vocational or secondary school graduates, was in the highest demand and did not meet current labor market requirements. (Department of Employment, 2020) In addition, attitudes regarding morals and ethics of the youth could also be improved. (Office of the Education Council, 2017b)

Dual Vocational Education (DVE) is a government-funded Technical and Vocational Education and Training (TVET) program to develop the workforce through the cooperation of vocational institutions and companies. Colleges and companies, in this regard, can be seen as places engaged in nation-building, forming citizens and workers by passing on essential knowledge, skills, and values. (Reid & O'Donoghue, 2004) Learner, who goes through this program, will have two status quos - one as a student who studies fundamental subjects at college and the other as a worker who gets technical and occupational training at a company. This system allows mutual benefits for all three parties. College can reduce expensive machinery and equipment costs, a student can get opportunities for direct experiential learning in a working environment, and a company can get tailor-made labor skills and reduce turnover risk. Employees designated to train students must be certified as on-site instructors by the Office of the Vocational Education Commission (OVEC). (Vocational Education Commission, 2015).

Teachers with solid competencies can positively impact training outcomes. For example, studies by Borko and Mayfield (1995) indicated that teacher education impacted teachers' personalities and instructional skills and eventually positively impacted students' learning. In addition, studies by Towler (2009) and Harris et al. (2014) showed instructor expressiveness and directiveness yielded satisfaction as training outcomes and knowledge transfers.

On the other hand, workplace instructors, who were experts in their respective fields, were usually not trained teachers. Therefore, their pedagogical competencies might be less strong than the trained ones, and could negatively impact student outcomes. Studies by Cox and Kontiainen (1973) indicated that untrained trainers had difficulties understanding their teacher role and overemphasized the colleague aspect. Also, untrained trainers tended to teach from ad-hoc co-operative interaction rather than through organized programs that trained trainers would use. Moreover, a study on DVE by the Standing Committee on Education and Sports (2016) reported that (1) workplace instructors were not ready to give training and were not good at evaluation, (2) there were not enough qualified instructors to teach, (3) instructors did not train but aimed at using student labor, and (4) companies were not engaging with colleges in planning, so they lacked proper curricula and training plans. The committee suggested that instructors in the workplace should be qualified and gain more knowledge in various topics such as theoretical and practical understanding of subjects, teaching methods, teaching psychology, and information technology. In addition, they should be educated to be more consistent with the social and economic environments of the 21st century.

Although many works have been done to date, the competency development needs of workplace instructors have not been conducted much in the field of dual vocational education to indicate the degree of urgency.

Research Objective

To explore the current and desirable states of competency development of workplace instructors under public vocational college networks in Bangkok based on the concept of the dual vocational education system's instructor competency.

Literature Review

Competency Definition

In psychology, White (1959) viewed competence as capacity, with the willingness to master, to effectively interact with the environment. He considered it necessary to treat competence as having a motivational aspect. That attaining competence could not derive wholly from drives or instincts, as explained in the drive theory of Sigmund Freud. Like when an infant learned a series of skills such as sucking, crawling, exploring, or manipulating surrounding objects, it had in its sense to achieve higher levels of motor and mental coordination. An adult, whose root causes were far more complicated, could gain force because their services could produce results in terms of career and income.

Boyatiz (1982) described competencies as specific characteristics or abilities of a person that enabled him or her to demonstrate the appropriate specific actions to the job performance. Those underlying characteristics were motives, traits, skills, aspects of one's self-image or social role, or bodies of knowledge that he or she used.

L. M. Spencer and Spencer (1993) described competency as underlying characteristics - motives, traits, self-concept, knowledge, and skill - of an individual causally related to criterion-referenced effective or superior performance in a job or situation. A characteristic would not consider a competency unless it contributed to something meaningful in the real world - as measured on a specific criterion or standard.

In the educational field, McClelland (1973) suggested that schools, colleges, and employers test for competence rather than for intelligence, as competence could be a better predictor of success than grade. As one grows in experience, wisdom, and ability to perform tasks effectively, their competencies increase; accordingly, improved behaviors can lead to occupational and social outcomes, such as leadership and interpersonal skills.

National Qualifications Framework (NQF)

For a broader view, National Qualifications Framework (NQF) are guidelines for linking all levels and types of qualifications of the country and competency levels of an individual whose learning outcomes were from education, training, and experiences. NQF contains (1) Educational qualifications, which were the responsibility of educational institutions; and (2) Occupational standards or professional qualifications, which were responsible by various institutions such as the Department of Skill Development (DSD), Ministry of Labour and Thailand Professional Qualification Institute (Public Organization) (TPQI). These standards needed NQF to reference each other and unify the national workforce development system.

Furthermore, to be consistent with the free movement of skilled labor within the ASEAN Economic Community, the Ministry of Education agreed to adjust the previous NQF from nine levels to match eight levels of the ASEAN Qualifications Reference Framework (AQRF) in 2017. (Office of the Education Council, 2017a)

Competency standard of workplace instructors

To be eligible for training in DVE, an instructor in the workplace must meet educational qualifications or have occupational experiences according to section 55 of Vocational Education Act B.E. 2551 (2008). Furthermore, as a requirement under section 9 of Skill Development Promotion Act B.E. 2545 (2002), one must pass the 30-hour workplace-instructor training program of OVEC or have at least six months of experience teaching in establishments that collaborated on dual vocational education. For the instructor who aimed for a higher occupational level, one might decide to continue one's education or take a test to the desired level, such as the National skill standard test of DSD or professional qualification of TPQI. (Thailand Professional Qualification Institute. (Public Organization), 2016)

In an international context, "Standard for In-Company Trainers in ASEAN Countries" is another widely accepted standard influenced by the German standard initially developed as a training program for companies in the Mekong Region by 60 experts from 6 the ASEAN Member States with support from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). It was subsequently endorsed by ASEAN Senior Officials Meeting on Education (SOM-ED) and the ASEAN Senior Labour Officials Meeting's Working Group on Progressive Labour Practices to Enhance the Competitiveness of ASEAN (SLOM-WG). The standard contains four main domains of instructor competency: (a) analyzing works tasks and defining learning requirements, (b) planning and preparing training, (c) conducting training, and (d) evaluation and further development of training. (Chaloeyjanya & Suradom, 2016; Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2019)

Conceptual Framework

In this paper, the competencies of DVE workplace instructors were grouped into four main domains: (a) Occupational Practice, (b) Attitude, (c) DVE Management, and (d) Learning Management. Evaluated by five experts in the field of vocational education, the conceptual framework of DVE instructor competency (Figure 1) was developed through synthesizing various training programs, standards, and regulations related to DVE, such as the Workplace instructor development program (Bureau of Personnel Competency Development, 2014), Occupational Standard and Professional Qualifications of workplace instructor (Thailand Professional Qualification Institute (Public Organization), 2016), Standard for In-Company Trainers in ASEAN Countries (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2019), Regulations of the Teachers' Council of Thailand - Professional Standards (Royal Thai Government Gazette, 2019), Curriculum for the Certificate of Vocational Education B.E.

2562, and curriculum for the Diploma of Vocational Education B.E. 2563 (Office of the Vocational Education Commission, 2019, 2020)

The framework also contained dimensions of development: on-the-Job, off-the-job, and mixed-method development, which could be used for further feasibility studies. The part was developed by reviewing pieces of literature: Determinants of successful training practices in large Australian firms (Dawe, 2003), Learning and Development for Managers: Perspectives from Research and Practice (Sadler-Smith, 2006), Human resource management (Byars & Rue, 2010), 702010: Towards 100 % Performance (Arets, Jennings, & Heijnen, 2016), Human Resource Management (Dessler, 2017), and Human Resource Management in Education: The New Normal (Narintarangkul Na Ayudhaya, 2020)
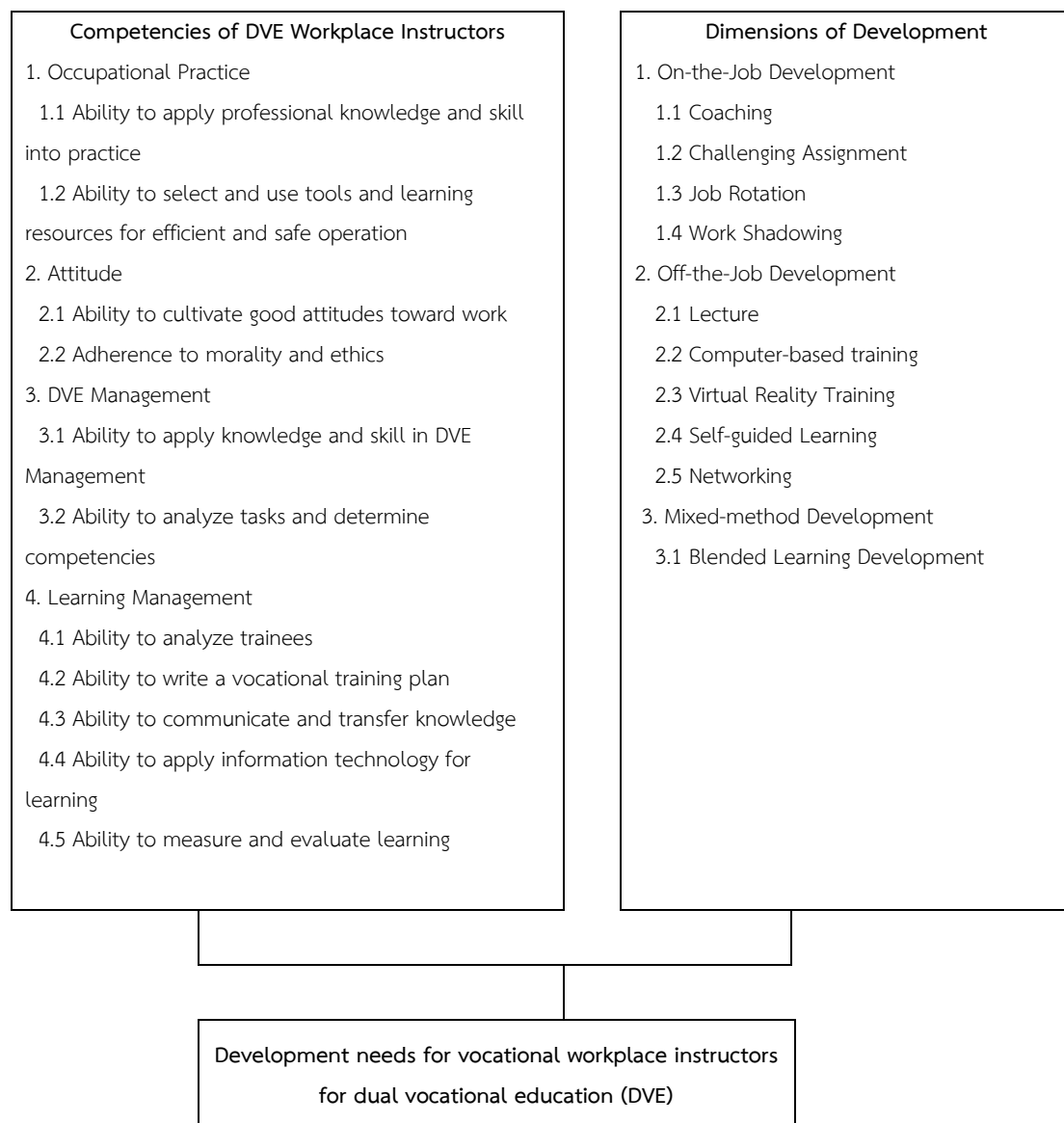
Competencies of DVE Workplace Instructors	Dimensions of Development
1. Occupational Practice	1. On-the-Job Development
1.1 Ability to apply professional knowledge and skill into practice	1.1 Coaching
1.2 Ability to select and use tools and learning resources for efficient and safe operation	1.2 Challenging Assignment
2. Attitude	1.3 Job Rotation
2.1 Ability to cultivate good attitudes toward work	1.4 Work Shadowing
2.2 Adherence to morality and ethics	2. Off-the-Job Development
3. DVE Management	2.1 Lecture
3.1 Ability to apply knowledge and skill in DVE Management	2.2 Computer-based training
3.2 Ability to analyze tasks and determine competencies	2.3 Virtual Reality Training
4. Learning Management	2.4 Self-guided Learning
4.1 Ability to analyze trainees	2.5 Networking
4.2 Ability to write a vocational training plan	3. Mixed-method Development
4.3 Ability to communicate and transfer knowledge	3.1 Blended Learning Development
4.4 Ability to apply information technology for learning	
4.5 Ability to measure and evaluate learning	

Development needs for vocational workplace instructors for dual vocational education (DVE)

Figure 1 Conceptual framework of DVE instructor competency and dimensions of development

Research Methodology

    1. Population and sample

The population used in this research comprised workplace instructors and college supervisors from public vocational colleges in Bangkok.

The research sample was 384 workplace instructors, who were chosen randomly, and 18 college supervisors, who were chosen purposively. Since the actual population size of workplace instructors was unknown, the sample size was calculated using Krejcie and Morgan equation with a 95 % confidence level at a margin of error plus or minus five percentage points. (Krejcie & Morgan, 1970)

    2. Research Instrument

The instrument used in the data collection was a closed-ended survey based on the aforementioned conceptual framework. It contained two parts: (a) general information of respondents and (b) respondents' opinion on the current and desirable states of the development needs of workplace instructors based on the dual vocational education concept on a 5-point rating scale, ranging from 1 (the lowest) to 5 (the highest). The questionnaire was submitted to a panel of five experts to examine its content validity. It was revised based on their comments before it was tried out with 30 participants, whose characteristics were like those of the main study participants. The internal consistency of the questionnaire was determined to be acceptable to both scales of current and desirable state. (Cronbach's Alpha: 0.999 and 0.997 respectively).

    3. Data Analysis

The collected data from questionnaires were analyzed by using frequency distribution, percentage, mean, standard deviation, and modified Priority Needs Index (Wongwanich, 2005), which calculated by the following formula:

$$PNI_{modified} = \frac{I-D}{D}$$

Where: I represents mean score of desirable state, D represents mean score of present state

Research Findings

1. Demographics data of questionnaire respondents

Table 1 showed that half of the studied samples (51.8 %) did training in commerce and 40.1 % in industrial trade while small percentages in home economics and information & communication technology. More than half of them (74.2 %) earned a bachelor's degree, and 21.6 % earned a master's degree. Most of them had more than five years of working experience, while 12.5 % had between two to four years, and 3.4 % had less than two years. There were 69.3 % of instructors who passed the required 30-hour training program of OVEC.

Table 1 Socio-demographic characteristics of the studied subjects.

Socio-demographic characteristics	Workplace Instructors		College Supervisors	
	N	%	N	%
Training Topics				
Home Economics	9	2.3	2	11.1
Information and communication technology	2	0.5	0	0.0
Commerce	199	51.8	5	27.8
Arts	0	0.0	1	5.6
Industrial Trades	154	40.1	9	50.0
Tourism Industry	20	5.2	1	5.6
Academic qualifications				
Upper Secondary Education	1	0.3	0	0.0
Diploma of Vocational Education	15	3.9	0	0.0
Bachelor's Degree	285	74.2	1	5.6
Master's Degree	83	21.6	15	83.3
Doctor's Degree	0	0.0	2	11.1

Socio-demographic characteristics	Workplace Instructors		College Supervisors	
	N	%	N	%
Years of experiences				
< 2	13	3.4	0	0.0
2-4	48	12.5	1	5.6
5-9	122	31.8	1	5.6
10-20	165	43.0	8	44.4
> 20	36	9.4	8	44.4
Pass required training course of OVEC				
Yes	266	69.3	-	-
No	118	30.7	-	-

2. Development needs based on the concept of the dual vocational education system's instructor competency

Analysis of the current and desirable state of development of DVE instructors was based on the conceptual framework of the dual vocational education system's instructor competency, which comprised four competency domains: (a) Occupational Practice, (b) Attitude, (c) DVE Management Competence, and (d) Learning Management Competency.

Table 2 displayed the results of the needs assessment of competency development for workplace instructors. The current state of overall instructor's development was found at a moderate level ($\bar{X}$ = 3.042, SD = 1.090), while the desirable state was found at the highest level ($\bar{X}$ = 4.541, SD = 0.513). Examining competency domains based on the modified priority need index ($PNI_{modified}$), the development of *Occupational Practice* domain had the highest priority ($PNI_{modified}$ = 0.4977), followed by the development of *Learning Management* domain ($PNI_{modified}$ = 0.4950). For individual competencies, the development of the ability to measure and evaluate learning was ranked first ($PNI_{modified}$ = 0.5052), followed by the development of the

ability to apply professional knowledge and skill into practice ($PNI_{modified}$ = 0.5027), and the ability to analyze trainees ($PNI_{modified}$ = 0.4993). Finally, adherence to morality and ethics had the lowest need index ($PNI_{modified}$ = 0.4780).

Table 2 The modified Priority Needs Index ($PNI_{modified}$) for competency development of DVE workplace instructors.

Competencies of DVE Workplace Instructors	Current State		Desirable State		PNI modified	Rank
	$\bar{X}$	SD	$\bar{X}$	SD		
1. Occupational Practice	3.020	1.082	4.523	0.519	0.4977	1
1.1 Ability to apply professional knowledge and skill into practice	2.997	1.068	4.503	0.518	0.5027	(1)
1.2 Ability to select and use tools and learning resources for efficient and safe operation	3.044	1.097	4.544	0.519	0.4929	(2)
2. Attitude	3.061	1.089	4.541	0.517	0.4834	4
2.1 Ability to cultivate good attitudes toward work	3.046	1.086	4.536	0.517	0.4889	(1)
2.2 Adherence to morality and ethics	3.076	1.091	4.546	0.518	0.4780	(2)
3. DVE Management	3.048	1.098	4.546	0.512	0.4915	3
3.1 Ability to apply knowledge and skill in DVE Management	3.046	1.103	4.546	0.511	0.4928	(1)
3.2 Ability to analyze tasks and determine competencies	3.050	1.093	4.545	0.512	0.4902	(2)
4. Learning Management	3.041	1.091	4.546	0.509	0.4950	2
4.1 Ability to analyze trainees	3.037	1.097	4.553	0.511	0.4993	(2)
4.2 Ability to write a vocational training plan	3.054	1.096	4.540	0.507	0.4867	(5)
4.3 Ability to communicate and transfer knowledge	3.048	1.081	4.547	0.510	0.4917	(4)
4.4 Ability to apply information technology for learning	3.044	1.083	4.543	0.511	0.4925	(3)
4.5 Ability to measure and evaluate learning	3.020	1.096	4.546	0.508	0.5052	(1)
Overall	3.042	1.090	4.541	0.513	0.4928	

Discussions

The finding showed that only 69 percent of workplace instructors had passed the 30-hour workplace-instructor training program of OVEC, and the current state of

competency development based on the conceptual framework of the DVE system was performed at a moderate level.

Survey results statistically showed that the current and desirable states of the workplace instructors' competency development were at moderate and highest level respectively. After analyzing each $PNI_{modified}$ that had values above means, it revealed that the *Occupational Practice* competency domain had the highest need for development, especially for the *ability to apply professional knowledge and skill into practice*. An organization must keep learning and improving to enhance its competitive advantage. Workplace instructors should develop the abilities to learn and use new pieces of knowledge and skill sets in practice to transfer their pieces of knowledge to their trainees eventually. High-quality instructors could produce high-quality workers, which could reduce the gap between the quality of labor and the requirements of the labor market. Marcus and Shoham (2014) found that the result of individual learning in the organization would combine into learning across the whole organization, which, as a result, would improve the ability of the organization to make rapid changes and stay strong in the competitive business environment.

The second-highest need for development was in the *Learning Management* competency domain, and by analyzing each aspect, the *ability to measure and evaluate learning* was ranked first. A trained teacher generally needed to ensure students' understanding of taught subjects and address weaknesses and misunderstandings in college. An instructor was expected to gain competency to evaluate trainees in an actual working environment. Failure to do so could cause unnecessary expenses or even accidents for novices, especially when working on machinery. In the industrial context, Babu et al. (2017) used a worker evaluation system to identify the best training method to improve employees' planning and problem-solving abilities, providing a safe work environment.

Under the *Learning Management* competency group, the subsequent need was to develop the *ability to analyze trainees*. In a dual vocation setting, an instructor usually trains mixed groups of students with different knowledge and skill set levels. Being able to analyze trainees' backgrounds, an instructor could then estimate their abilities to learn, choose suitable training content, and engage with vocational colleges in designing training plans. These were consistent with the findings of Rahmat et al. (2019). In their studies, learners progressed through the assimilation stage using the existing schema for new learning. Learners accepted new learning by relating the new to their old existing knowledge.

Recommendations

After investigating the needs of competency development based on the conceptual framework of the DVE system, recommendations were proposed below.

1. Policy Recommendations

1.1 Since the finding revealed that the development of occupational practice had the highest need, a company should formulate a policy to elevate employee skills to apply new pieces of knowledge and technologies into practice. Specific hands-on training methods should be identified. That was quite true when a company's competitive edge was its capacity to innovate, often bound on its people. Once instructors became masters in new techniques, it would allow the company to gain advantages by improving products and services. In addition, if their capabilities to transfer knowledge were expanded, they could bring learning to trainees and the whole organization.

1.2 As another finding suggested, the second-highest need was to develop *Learning Management* competencies, which included (1) analyzing trainees' background, (2) developing lesson plans, (3) communication skills and knowledge transfers,

(4) applying information technology for learning, and (5) measuring and evaluating learning outcomes - in other words, pedagogical skills needed improving. In DVE, an instructor needed to develop competencies in the pedagogical domain; otherwise, training would not be effective. Therefore, a company should define an explicit policy to support instructors in acquiring various pedagogical techniques. Since learning to teach could be a complex process, vocational college could also help train instructors in pedagogical topics or solve related issues. Instructors who possessed proper knowledge, skills, and attitudes would enable them to execute training programs effectively, adding value to the company.

      1.3 Since training could be cost and complicated for small organizations, on a larger scale, Vocational Education Commission might formulate supporting policies to produce quality instructors, especially for industries that lack skilled labor. In addition, seeking cooperation with other organizations within specific industries could be a viable option.

      2. Recommendations for Further Research

      The research result revealed the need to develop workplace instructors; however, suitable development methods have not yet been determined. Accordingly, it was suggested to conduct a study on developing workplace instructors in DVE for specific industries. Furthermore, adult learning and contemporary development theory could also be explored. Finally, since training and development activities for staff in an organization could be expensive (Gauld & Miller, 2004), feasibility studies should also be conducted if a company would be able to support instructor development programs.

Acknowledgement

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