



The development of industrial students coaching model under dual vocational training system for entrepreneurial trainer: Concentration in industrial education

Ophat Sukwan^{a,b,*}, Prapansiri Susaorat^{b,†}, Thanarat Taewattana^{c,†}, Wilailack Langka^{b,†}

^a Industrial Education Department, Faculty of Education, Srinakarinwirot University, Wattana, Bangkok 10110, Thailand

^b Educational Administration and Management, Industrial Education Department, Faculty of Education, Srinakarinwirot University, Wattana, Bangkok 10110, Thailand

^c Education department, Faculty of Education and Development Sciences, Kasetsart University, Kamphaeng Saen, Nakhon Prathom 73140, Thailand

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Abstract

The purpose of this research was to develop industrial students coaching model under the dual vocational training system for entrepreneurial trainers in industrial education. This research was conducted in three phases. Phase 1 explored the state, problems, and guidelines of coaching under qualitative research by document analysis and in-depth interview with 19 key informants. The result describes the structure of the elements in general context, coaching techniques, assessment and evaluation, and characteristics of trainers. The problems found were in lack of coaching and psychology, and guidelines of coaching describe characteristics of the trainers, step of coaching and support mechanism. Phase 2 developed the coaching model under qualitative research by SWOT analysis and focus group discussion by eight experts. The result was the GEAR+3 coaching model. It consists of GEAR with four steps of coaching, namely, Group preparation and planning, Education and coaching, Assessment for learning, and Reaction and standard settings. The +3 conditions for coaching support consist of dual vocational training management standards, competency of the trainers, and mechanisms of coaching support. The coaching model was transformed into a manual and was evaluated by 29 experts, and was found at high level. Phase 3 evaluated the efficiency and effectiveness of the coaching model by 5 trainers and 20 students by using an experimental research. The results found that the efficiency and the effectiveness were at high level.

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Introduction

A country aiming for development must be competitive both in regional and global levels. This requires human resources in the industrial sector possessing operational expertise (Office of the national economic and social development council, 2016).

Vocational education has a significant role in the development of manpower for the industrial sector of the country (Office of Vocational Education Commission, 2015b). However, the present manpower developed from vocational education is unable to demonstrate its potential directly. It is insufficient to comply with the demands of the industrial sector. Workers require further training in the workplace to develop capabilities that meet the needs of the job. As a result, companies lose money and time because they have to wait until the workers have acquired the necessary skills (Thansettakij, 2017) Dual vocational education comprises a system that resolves that problem. This system is a collaboration between educational institutions and entrepreneurs. The dual vocational education employs a trainer to supervise the

* Corresponding author.

E-mail address: ophast@hotmail.com (O. Sukwan).

† Co-first authors.

E-mail address: thanarat4u@gmail.com (T. Taewattana).

E-mail address: prapansiri@gmail.com (P. Susaorat).

E-mail address: W_langka@hotmail.com (W. Langka)

students until they become skilled at work (Office of Vocational Education Commission, 2015a). However, dual vocational education does not resolve everything. Most trainers still lack sufficient training. This is reflected in their students' under achievement in the desired competency (Abdulsata & Sutthinarakorn, 2016). Presently, the existing coaching techniques developed for trainers are insufficient, primarily due to various requirements in the industrial sector. For this reason, providing specific coaching assistance based on job characteristics in the industrial sector is needed (Bumpen, Phutiariyawat, Disathaporn, & Spawan, 2017).

Hence, this research proposed the idea of developing a coaching and suitable model for dual vocational training in industrial education. The research included specific purposes that were (1) to explore the state, problems, and guideline of coaching, (2) to develop and evaluate the quality of the coaching model and (3) to evaluate the coaching model in terms of efficiency and effectiveness. The coaching model would be valuable in the development of trainers to be a part of the vocational institutes and entrepreneur for human resource improvement, and would support the mechanism for job training that meets the production standards of vocational education; such includes a variety of coaching techniques and a system to support when problems occur.

Literature Review

The conceptual framework for this research is as follows:

Dual vocational education: This refers to the educational management process of the Vocational Education Commission for the production and development of manpower. This is the cooperation of the educational institution and entrepreneur. Internships in the workplace have a Trainer for coaching. **The trainer** is appointed for an internship and has a coaching competency consisting of knowledge, skill and attributes. (Office of Vocational Education Commission, 2015a; Thailand Professional Qualification Institute, 2019)

Coaching: This is the process of knowledge and skill development of industrial students coaching under dual vocational education system for entrepreneur trainer in industrial

subject (Knight, 2009). The coaching is based on effective coaching principles which have common goals, a systematic and continuous coaching plan, gradual implementation, cooperation, trust, and good interpersonal relationships (Prasertsuk, 2011). Coaching helps the students to apply knowledge in real work situation effectively. In addition, coaching should have effective techniques. The coaching helps the learners explore their potential, including the techniques of creating a relationship, trust, and confidence, techniques of delivering knowledge and practical skills, observing and giving feedback in order to develop the learners meet their highest goal (Satchukorn, 2004)

The efficiency of the coaching model: The efficiency of the coaching model is the competency of the trainers in using the coaching model, that consists of (1) *Knowledge*, it is the knowledge in coaching and self-development, coaching psychology, evaluation, curriculum management, vocational institute management, entrepreneur management, and trainer management. (2) *Skills*, these consist of professional skills, practice skills, skills in technology and communication, coaching skills, counseling skills, assessment skills, and reflection skills. (3) *Attributes*, these consist of personality and interpersonal relations, open mind, collaboration, morality and professional ethics, teamwork, and professional self-development (Thailand professional qualification institute, 2019).

The effectiveness of a coaching model: The effectiveness of the coaching model is the competency of the students, that consists of (1) *knowledge* which consists of knowledge about work, working techniques, work safety, job scope, job goals, expectations of the organization, and recognition of one's strengths and weaknesses. (2) *skills* which consist of correct operation, working within a specified time, work efficiency, planning skills, prioritizing operations, use of tools or equipment, correct operation, and team-work. (3) *attributes* which consist of good relationships, listening to opinions, enthusiasm, inner strength, confidence, self-development, appreciating the importance of work, problem-solving ability, and assertiveness (Office of vocational education commission, 2014).

From the literature review, the conceptual framework of the research can be defined as in Figure 1.

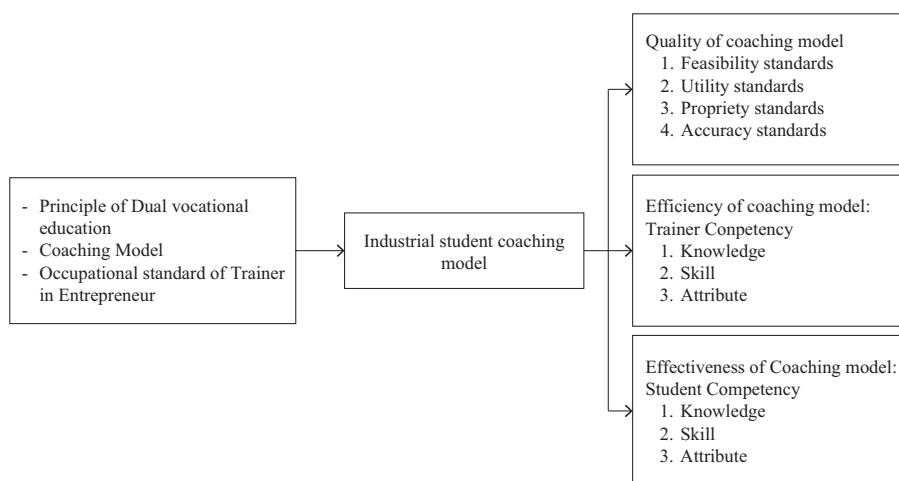


Figure 1 Conceptual framework

Methodology

This research developed a coaching model in 3 phases.

Phase 1: This explored the state, problems, and guidelines of coaching under qualitative research methodology. The procedures were as follows (Mekarkakorn, Narkwiboonwong, & Sutthinarakorn, 2019): First, documents analysis in the areas of dual vocational management in industrial education, curriculum of dual vocational management in industrial education, professional competency of trainer, and coaching of trainer was undertaken. The information was synthesized to construct in-depth interview questions. Second, in-depth interviews that explored the state, problems, and guidelines of coaching were carried out. There were 19 key informants for in-depth interviews, which included five (5) trainers from companies in Bangkok, not limited to the experience of coaching; seven (7) dual vocational students in industrial education who were undergoing entrepreneurial internships; seven (7) experts consisting of one coaching expert, one professional competency trainer, one best practice trainer; one vocational institute director, one academic deputy of the vocational institute, one supervisor, and one teacher, Research tools were in-depth interviews. The results of in-depth interviews were transformed to a structure of state, problem and guideline of coaching.

Phase 2: The quality of the coaching model under qualitative research methodology was developed and evaluated. The procedures were as follows: First, a coaching strategy using a structure of state, problems, and the guidelines of coaching from Phase 1 was created. SWOT Analysis was used to develop the coaching strategy and construct a first draft of coaching. Second, the first draft coaching model was examined by eight (8) experts through focus group discussion (FGD) technique (Mekarkakorn, Narkwiboonwong, & Sutthinarakorn, 2019) The experts were divided into two (2) groups: one was the group of experts from vocational institutions that had at least five (5) years of supervising experience in entrepreneurship, and the other was the group of experts who were the best practice trainers from entrepreneurs with at least ten (10) years of work experience. The researcher was the moderator in the focus group discussion. The researcher clarified the objectives and led the discussion. All experts gave suggestions for the revision of the first draft coaching model and transformed it to a manual of coaching model. Lastly, was the evaluation of the quality of the manual in terms of feasibility, utility, propriety, and accuracy standards. The quality of the questionnaires was evaluated by five (5) experts with the Index of item Objective Congruence (IOC) not less than 0.67. The questionnaire was evaluated by twenty-nine (29) experts consisting of vocational institute administrators, academic deputy administrators, heads of the training department, supervising teachers, trainers, and teachers. The t-test was used to test the difference between result, and criteria were at 4.00.

Phase 3: The coaching model was evaluated in terms of efficiency and effectiveness under an experimental research methodology. The procedures were as follows (Wongrattana & Naiyaphat, 2008): Five (5) trainers used the manual of coaching model with 20 students. Each group had one (1) trainer and four (4) students. The trainers were selected

specifically from the entrepreneurs who were coaching students from Nongjok Kanchanaphisek Vocational College, which provides a full dual vocational system. The experiment was done for one (1) month and evaluated afterwards. The efficiency of coaching model was competency of the trainer consisting of knowledge, skills, and attributes of coaching, while using the manual of coaching model. The effectiveness of the coaching model was the competency of the students consisting of knowledge, skills, and attribute of coaching. The efficiency and effectiveness were evaluated by five (5) rating scale questionnaire. The questionnaire was prepared in two parts. The first part was the evaluation of the efficiency of the coaching model, where the five (5) trainers evaluated themselves whilst the second part was the evaluation of the effectiveness of the coaching model, where the twenty (20) students were evaluated by the trainers. The *t*-test was used to test the difference between results, and criteria were at 4.00.

Result

Phase 1: State, Problem, and Guidelines of Coaching

The state of coaching

1. The general context; the entrepreneurial trainers must be professionals and have satisfied the institution's criteria. Large organizations have a management system for the trainers according to their standards. Moreover, the education institution will work in partnership with the organization to create a coaching plan before sending the students for an internship. There is only a 30-hour internship session for entrepreneur trainers following the same curriculum as the vocational education center, which is in accordance with the standard of the dual vocational education system. However, some organizations send only a few trainers to attend a training course.

2. Coaching Techniques; in a practical section, demonstration and practice in the work field were used. The students practiced under the supervision of the trainer or the assigned person when the trainer had other work to do. This was performed to avoid damage to equipment and the ability to focus on safety. In the theoretical section, some lectures in a mentoring way will make students feel more intimate. In this manner, they have the courage to ask questions. However, the trainers still focus on practical performance rather than good guidance, and the role of coaching is still unclear. In addition, it was found that during coaching, the trainers expected the student's performance to satisfy their expectations. The trainers neglected to teach virtues, ethics and proper behavior to the students. Moreover, some trainers assumed it was the duty of the personnel department of the organization to take care of and perform the coaching.

3. Assessment and Evaluation; the trainers conducted assessments and evaluations required by the institutions. However, some trainers did not inform the students of the evaluation criteria or the results. In addition, the trainers did not know they could assess the students according to the actual conditions or utilize other methods, in addition to examinations.

4. Characteristics; it was found that the trainer's personality and interpersonal relationship could cause apprehension among students in approaching them. In addition, the trainers did not provide enough time for the students to seek consultation. Some trainers rarely inform the students of the training plan in advance. Thus, the students were unable to prepare.

The problem of coaching

The trainers did not cooperate completely with institutions in the planning process and also failed to inform the students about the purposes of the training. In addition, in coaching, some trainers still lacked psychology in coaching, for example, in cases where students were sometimes incapable of doing the task or completed it incorrectly; the trainer would blame, scold, or compare them with other students who were in the same class. This prevented students from completing the training for fear of committing mistakes, therefore losing their self-confidence.

The guidelines of coaching

1. Trainer's characteristics; in terms of knowledge, they must be a graduate in the required field, have experience, skills, and expertise in the job. They should possess coaching techniques that encourage students to obtain knowledge by focusing on student-centered method as well as have virtue

and ethics, especially possessing discipline and responsibility. Furthermore, they should acquire a personality as a teacher, possess communication skills, interest in education development, appreciate the differences among students and be patient and open to students' opinions.

2. Trainer's role; the trainers should focus on coaching so that the students can discover their own abilities, especially their strengths and the point that needs to be developed. In addition, they should give feedback straightforwardly and provide the students with opportunities to exchange knowledge and opinions for the benefit of efficient performance.

3. Planning; each coaching session should be conducted systematically. Students should be informed of the plans. Also, the trainer must have a belief that all students have their potential developed.

4. Manual; there should be a coaching handbook for self-learning. The handbook should not have complicated steps, and should have examples, case studies, and solutions in terms of coaching techniques, psychology for coaching and assessment and evaluation.

5. Self-improvement; there is a need to know the psychology for self-improvement, understanding the learners, assessment and evaluation and coaching techniques.

The information was classified by content analysis into categories to create a structure of state, problems, and guidelines of coaching, as shown in Figure 2.

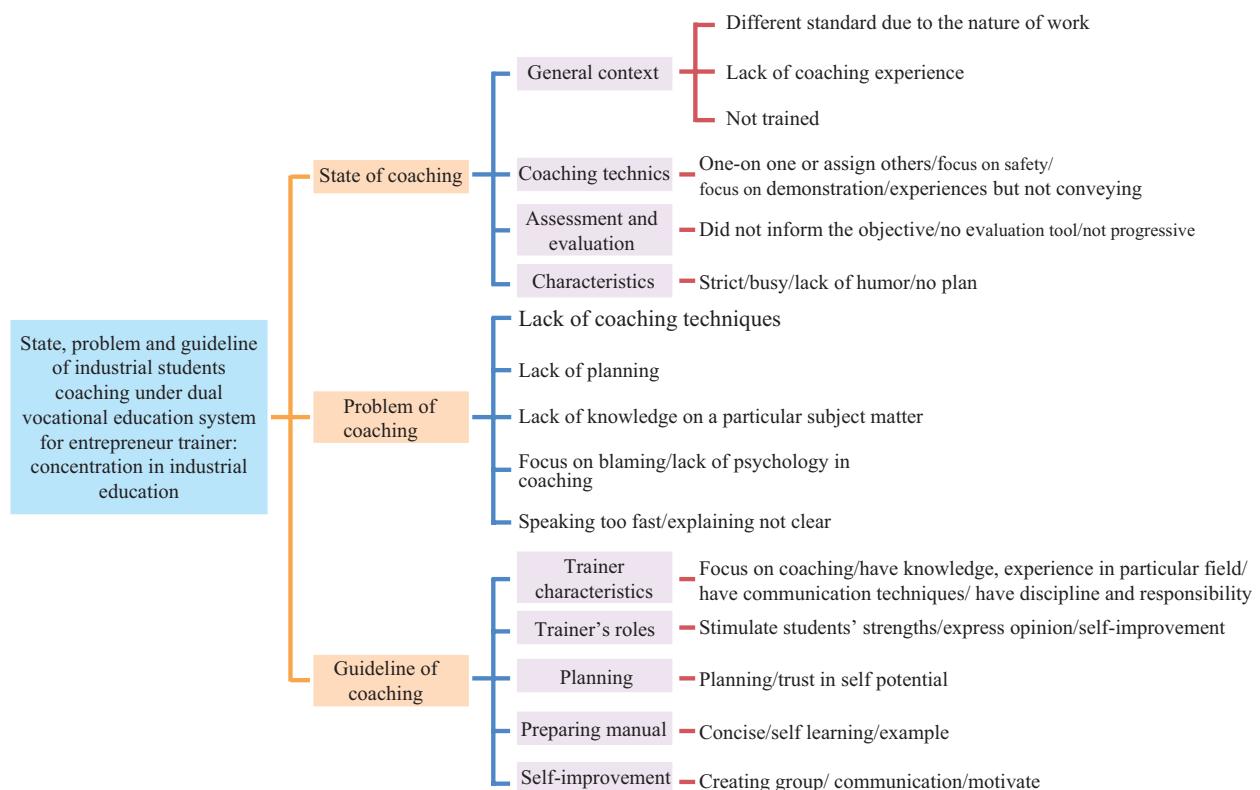


Figure 2 State, problem and guideline of coaching

Phase 2: Coaching Model

Coaching strategy was created by SWOT analysis using a structure of state, problems, and the guidelines of coaching from Phase 1. The information transformed to strengths and weaknesses of trainers, opportunity and threat of external factors. The coaching strategy is as shown in Table 1.

The coaching strategy was applied to the first draft coaching model and was examined by eight experts through focus group discussion (FGD) technique. All experts gave suggestions for the revision of the first draft coaching model. This completed model was called GEAR+3 Coaching Model. GEAR is the four Steps of Coaching: (1) Group Planning including studies of the work standard and vocational curriculum, planning with trainer team, and clarification of training plan to students. (2) Educating and coaching including teaching, coaching and demonstration of work, control and guidance while students practice. (3) Assessment and Evaluation including clarifying the situation and work

progress, evaluating students' practices, and analysis of training. (4) Reaction and Standard Setting including discussing the problems encountered during the training, finding the strengths and weaknesses, and setting the standard for coaching. The +3 are three conditions for coaching support consisting of: (1) Dual vocational training management standard that includes curriculum management, vocational institute management, entrepreneur management, and trainer management. (2) Competency of Trainer that includes knowledge of coaching and self-development, knowledge of psychology, career-technology-communication skill, personality and relationship, and knowledge of evaluation. (3) Mechanisms of coaching support that includes of self-learning mechanism, team coaching mechanism, and coaching manual mechanism. (Figure 3). The GEAR +3 coaching model was transformed to a manual and evaluated the coaching model standard at high level. Coaching Model Standards Evaluation was statistically significantly higher by 0.19 than a normal score of 4.00, $t(29) = 1.89$, p (one-tailed) = .03 (Table 2).

Table 1 SWOT analysis and coaching strategy making

SWOT Analysis		Coaching Strategy
Strengths	<p>Trainer strengths</p> <ul style="list-style-type: none"> - Knowledge, coaching ability - Having theory and practical coaching techniques - There is an emphasis on focus and caution in the operation. - There is supervision and monitoring of progress - Having a good relationship - There is measurement and evaluation. 	<ul style="list-style-type: none"> - The coaching model should focus on creating standards and systematic coaching procedures for easy implementation. - The coaching model details include coaching planning, coaching techniques, coaching psychology, trainers' personality, media and technology skills for coaching, and measurement and evaluation skills. - The coaching model should create a trainer team for exchanging and working together.
Weakness	<p>Trainer weaknesses</p> <ul style="list-style-type: none"> - Focusing on the teacher as the center - Focusing on performance inspections rather than good guidance - Not understanding the role of coaching or job procedure - Not focusing on morality, ethics, or behavior control - Not informing the evaluation details - Having a serious personality 	<ul style="list-style-type: none"> - The coaching model should be easy to use, convenient to use, able to be studied and learned by yourself, and made into manuals and electronic media. - The coaching model should be able to provide help and counseling in case of questions or needing help. - There are various contact methods and a variety of case studies with solutions.
Opportunity	<p>Opportunity from external factors</p> <ul style="list-style-type: none"> - The government promotes dual vocational education - Clear standards - Collaboration between schools and entrepreneurs. - A system of coaching for teachers according to the standards of entrepreneur - Coaching training from a vocational institute or professional qualification institute 	
Threat	<p>Threat from external factors</p> <ul style="list-style-type: none"> - Entrepreneur does not allow trainers to train everyone - Entrepreneur sends people who are not trainers to train - Entrepreneur lacks good management - Entrepreneur lacks coordination when coaching problems occur 	

Table 2 Coaching Model Standard Evaluation

Coaching Model Standards Evaluation	<i>M</i> (<i>SD</i>)	<i>t</i> -test (<i>p</i> , one-tailed)	<i>n</i> = 29
1. Feasibility standards	4.13 (0.60)	1.14 (.13)	
2. Utility standards	4.18 (0.54)	1.80 (.04)*	
3. Propriety standards	4.21 (0.60)	1.87 (.04)*	
4. Accuracy standards	4.26 (0.59)	2.35 (.01)*	
Coaching Model Standards Evaluation	4.19 (0.55)	1.89 (.03)*	

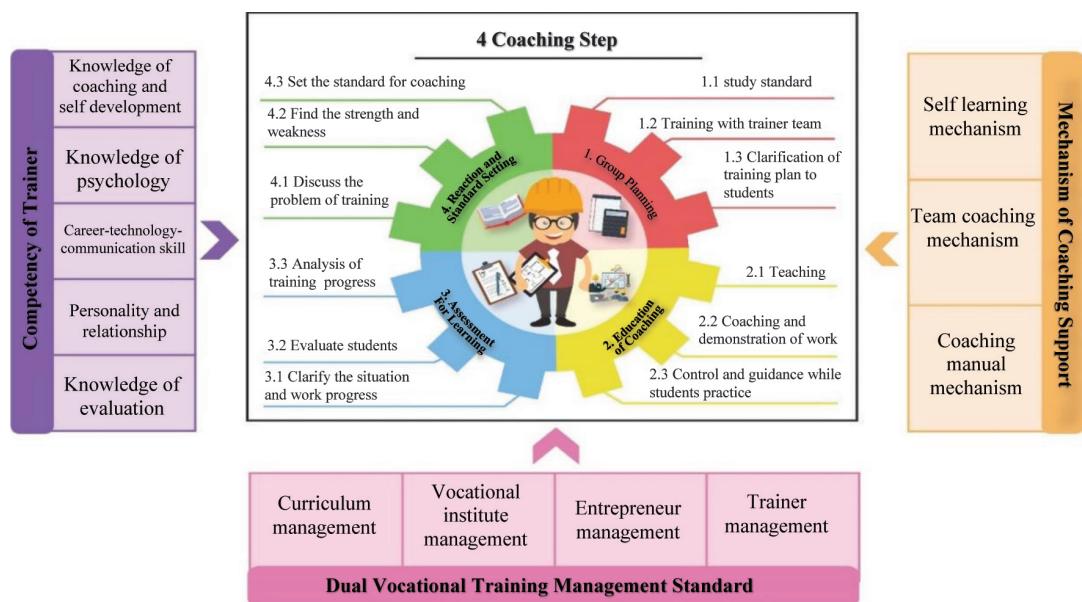


Figure 3 GEAR +3 Coaching model

Phase 3: The Efficiency and Effectiveness of the Coaching Model

GEAR+3 coaching model was evaluated for efficiency by considering coaching competency. 5 trainers who used manual of coaching model were self-assessors. The effectiveness of the coaching model was evaluated based on the ability of dual vocational students. 20 students were evaluated by 5 trainers, who used the manual of coaching model. Coaching Model efficiency was statistically not significantly higher by 0.03 than a normal score of 4.00, $t(4) = 0.27$, p (one-tailed) = .40. Coaching Model effectiveness was statistically not significantly higher by 0.08 than a normal score of 4.00, $t(4) = 0.43$, p (one-tailed) = .21 (Table 3).

Discussion

The state, problems, and guideline of coaching. The state, problems, and guidelines of coaching using in-depth interviews with key informants demonstrated the reality of coaching occurring in the industry such as some companies not collaborating with vocational institute (Gessler, 2017). Dual vocational education is unique according to different job

characteristics. Therefore, the trainers who are part of the job coaching for the students, need to acquire coaching skills that can respond to the different coaching methods. Coaching skills are becoming part training that impact on developing trust, awareness, responsibility and learning and ultimately on engagement and performance (McCarthy, & Milner, 2013)

The result of coaching model was the GEAR +3 coaching model. It was evaluated for quality, which was found to be very high because it had been developed by experts. It was evaluated by quality criteria consisting of (1) Feasibility standards which correspond with student development and a format that is easy to understand, practical and clear. (2) Utility standards in the form of a manual, providing useful information, helping the coach to recognize the role of coaching so the trainer can help students improve themselves, and having step-by-step coaching procedures. (3) Propriety standards where procedures are explained, the roles of the stakeholders, the content is appropriate, the steps are taken, and the correct framework and supporting conditions are provided. (4) Accuracy standards where the objectives are clearly described, the roles and responsibilities of those involved, and the content are accurate. The coaching model is in accordance with the principles of coaching that is

Table 3 Efficiency and effectiveness of coaching model

Competency	Efficiency of coaching model: Trainers competency		Effectiveness of coaching model: Students competency		$n = 5$
	$M (SD)$	t -test (p , one-tailed)	$M (SD)$	t -test (p , one-tailed)	
Knowledge	3.94 (0.55)	-0.23 (.42)	4.00 (0.48)	0.00 (.50)	
Skill	4.03 (0.18)	0.42 (.35)	4.09 (0.33)	0.61 (.31)	
Attribute	4.12 (0.11)	2.45 (.03)*	4.12 (0.46)	0.57 (.29)	
Total	4.03 (0.24)	0.27 (.40)	4.08 (0.42)	0.43 (.21)	

conducted in the coaching cycle. The coaching model consists of setting coaching goals, planning, collaboration, problem analysis, and improvements. This is so that the coaching cycle is suitable for different situations (Brown & Grant, 2010; Duangphasuk, Kittisaknawin, & Deesawadi, 2017; Happiness Coaching Studio, 2017; Hawkins, 2017). *The efficiency* was high level because coaching model is a tool that helps trainers learn about coaching. It includes dual vocational education standard, coaching techniques, coaching psychology, evaluation, problem analysis, knowledge creation, and problem solving. The trainers can use the model to practice in coaching performance planning, teamwork, communication, coaching, guidance, review, progress evaluation, performance testing, analysis and processing, learning exchanges, and using SWOT Analysis, and create a positive attitude towards work (Losch, Traut-Mattausch, Mühlberger, & Jonas, 2016). Also, in accordance with the Professional Development Institute, qualifications are required to develop and promote the occupational standard of trainer in entrepreneur by specifying 3 qualities which are knowledge, skills and attributes, which enable entrepreneur to develop manpower to achieve the desired success (Thailand Professional Qualification Institute, 2019). *The effectiveness* was high level because the coaching model helps students understand work assignments, the correct way to work, effective work techniques, the scope of work, job goals, and the needs of teachers. Practice expectations; the coaching model helps students work correctly as assigned, completing tasks within the specified time, performing efficiently, working smoothly, quickly and safely, with skills in planning and prioritizing jobs, have skills in using tools or equipment, work in accordance with the steps, have skills in working as a team. Adhere to vocational standards; a dual vocational system which aims to produce manpower to meet the entrepreneur's needs, consisting of competency and attribute (Department of Dual Vocational Education, Office of Vocational Education Commission, 2014). In addition, the model helps students develop the ability to listen to suggestions, have strong work ethics, enthusiasm for work, motivation for self-improvement, confidence in work, establish good relationships with colleagues, have the ability in problem-solving, be assertive, and have a desire for learning. Coaching facilitated process lead by a trainer and students to achieve educational objectives and their educational goals, and as a direct interaction to make coordinated, task-appropriate use, and gain the educational skills (Fazel, 2013).

Recommendation

GEAR +3 coaching model can be used for policymaking and collaboration between educational institutions and entrepreneurs to develop human resources for the industrial sector.

Conflict of Interest

There is no conflict of interest.

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