Research Article
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Training Course Construction for Dual Vocational Training of Vocational Teachers in the Eastern Region

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Abstract

The study pursued four main objectives (1) to study basic information on developing training courses for bilateral trainings, (2) to construct a training course, (3) to assess the effectiveness of the training course construction, and (4) to follow up and evaluate the outcomes after the training course. The participants in this study were 20 vocational teachers from schools in the castern region of Thailand. The researcher analyzed the data as follows: 1) the mean and standard deviation were used to compute the descriptive data, 2) the IOC, the difficulty level, the discrimination level, the Efficiency of Process (E1), and the Efficiency of Product (E2) scores were used to determine the quality of the research tools in the training, 3) the t-test was used to evaluate the differences in the means between pre-test and post-test scores. The results of the study were as follows: 1) the developed training course consisted of four elements, i.e., objectives, content, learning experiences, and evaluation, 2) the results of the effectiveness validation of the developed training program of 20 teachers revealed E1 = 83.88 and E2 = 85.80, 3) the results of the training course construction with the 20 teachers show that the post-training score exceeded the pre-training score, and 4) in regard to the outcomes of the follow-up based on the training opinions and recommendations after the training was conducted, the overall picture of reveals high levels in all aspects.

Keywords: Dual Vocational, Vocational Teachers, Training

Introduction

The industrial sector in the eastern region of Thailand is regarded as the country's major manufacturing sector, with an increasing number of industrial products manufactured. Hence, industrial manufacturing is the key manufacturing segment of the eastern region. The industrial sector in the eastern region of Thailand has marked the biggest pace of growth, with five-year growth (2017-2022) having consistently expanded. The key industries and manufacturing facilities are concentrated mainly in Chonburi and Rayong, with the manufacturing and petroleum industries being the two biggest contributors (The Office of National Economic and Social Development Council, 2017-2022).

The dual vocational training (DVT) program is a form of educational management that requires collaboration between two parties. It is a form of dual vocational education management

where a vocational school collaborates with a private business operator to provide training for vocational learners and enhance their qualifications to the extent that they can meet or keep up with growing demands in the current labor market.

Wenzel (2000, p. 8) mentions the objectives of a DTV program, suggesting that the program can allow the private operator to increase the value of a training by adding content related to the business or the operation of that particular operator rather than just the compulsory content required by the curriculum. In addition, the DVT program can help support appropriate adjustments to certain vocational training requirements or eliminate unnecessary curriculums. All in all, the program can accommodate any changing economic requirements or demand. Therefore, the researcher developed an interest in this topic.

The findings of this study were expected to be applied to the development of vocational teachers in terms of the DVT program, which is one of the key objectives of vocational education management that ensures international standards. This area of development is carried out alongside the enhancement of the country's competitiveness, Thai education in the Thailand 4.0 era, and the development of vocational learners in the Thailand 4.0 era going forward. This research has been reviewed by the Ethics in Human Research, certificate number IRB2-050/2566.

Research objectives

1. To study basic information on developing training courses for bilateral training of vocational education teachers in the eastern region.
2. To construct a training course for DVT of vocational teachers in the eastern region.
3. To assess the effectiveness of the training course for DVT of vocational teachers in the eastern region.
4. To follow up and evaluate the outcomes after the training course for DVT of vocational teachers in the eastern region.

Expected Benefits

The direct benefits of the study start with the participants acquiring basic information about training courses for bilateral training of vocational teachers in the eastern region, thus managing DVT effectively. The participants will also gain a better understanding of the roles and responsibilities of effective implementation of the DVT program.

The indirect benefits of the study include the participants absorbing knowledge on the management process for bilateral training of vocational teachers in the eastern region; hence, they can complete the learning objectives in collaboration with private operators, which could directly meet the labor demand in the industrial sectors.

Additionally, the participants will be able to develop a plan or method to manage comprehensive DVT for teachers in the eastern region, covering all professions in both the industrial and management sectors. The developed plan will be subsequently implemented in the actual workplace.

Conceptual framework

The conceptual framework of this study is illustrated below:

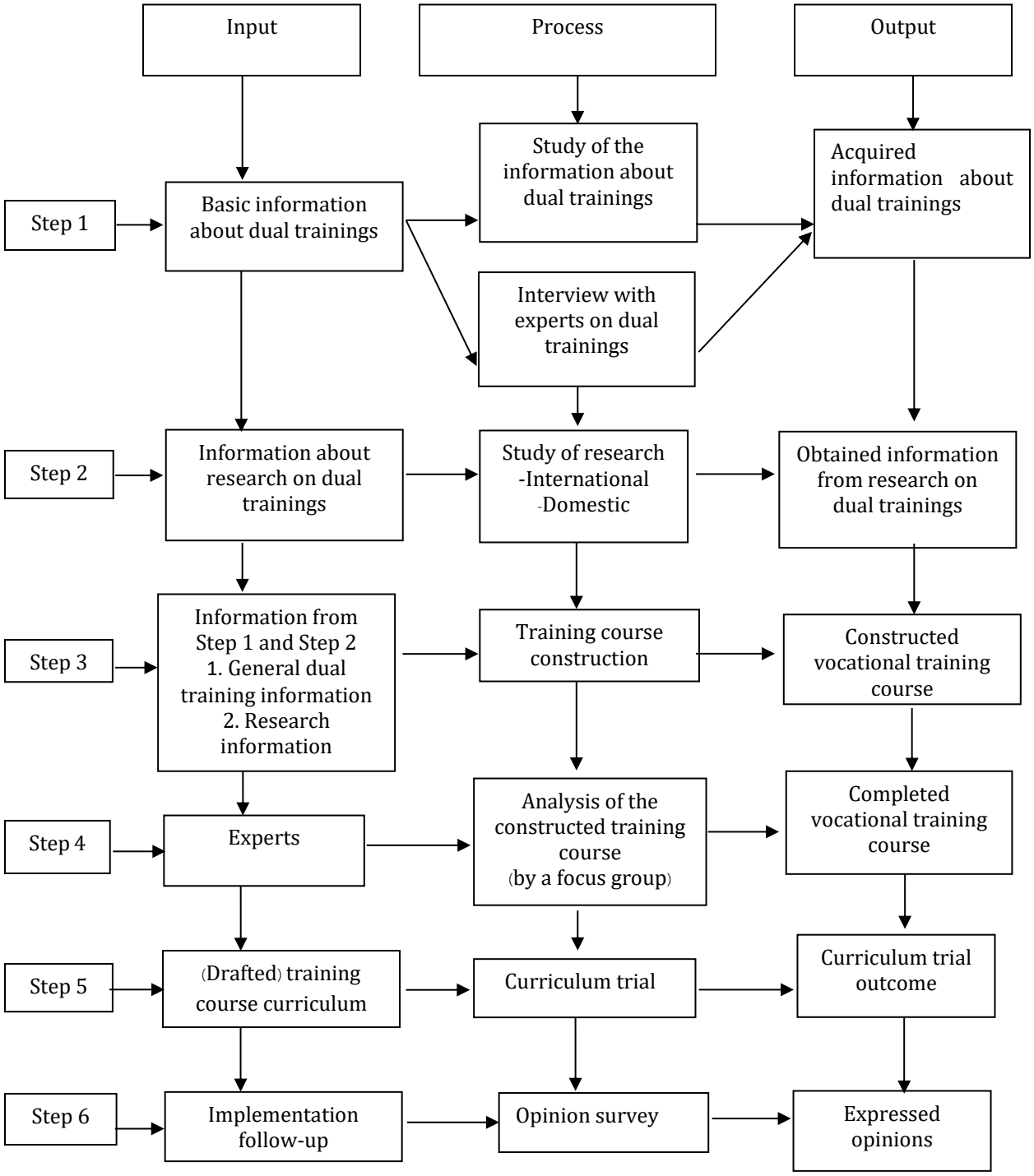
Independent Variables

Develop teachers by using dual vocational training for vocational teachers in the eastern region

Dependent Variables

1. The effectiveness of the training course
2. The achievement of the training course
3. Comments or recommendations on the developed dual vocational training course for vocational teachers in the eastern region

Conceptual framework of the study



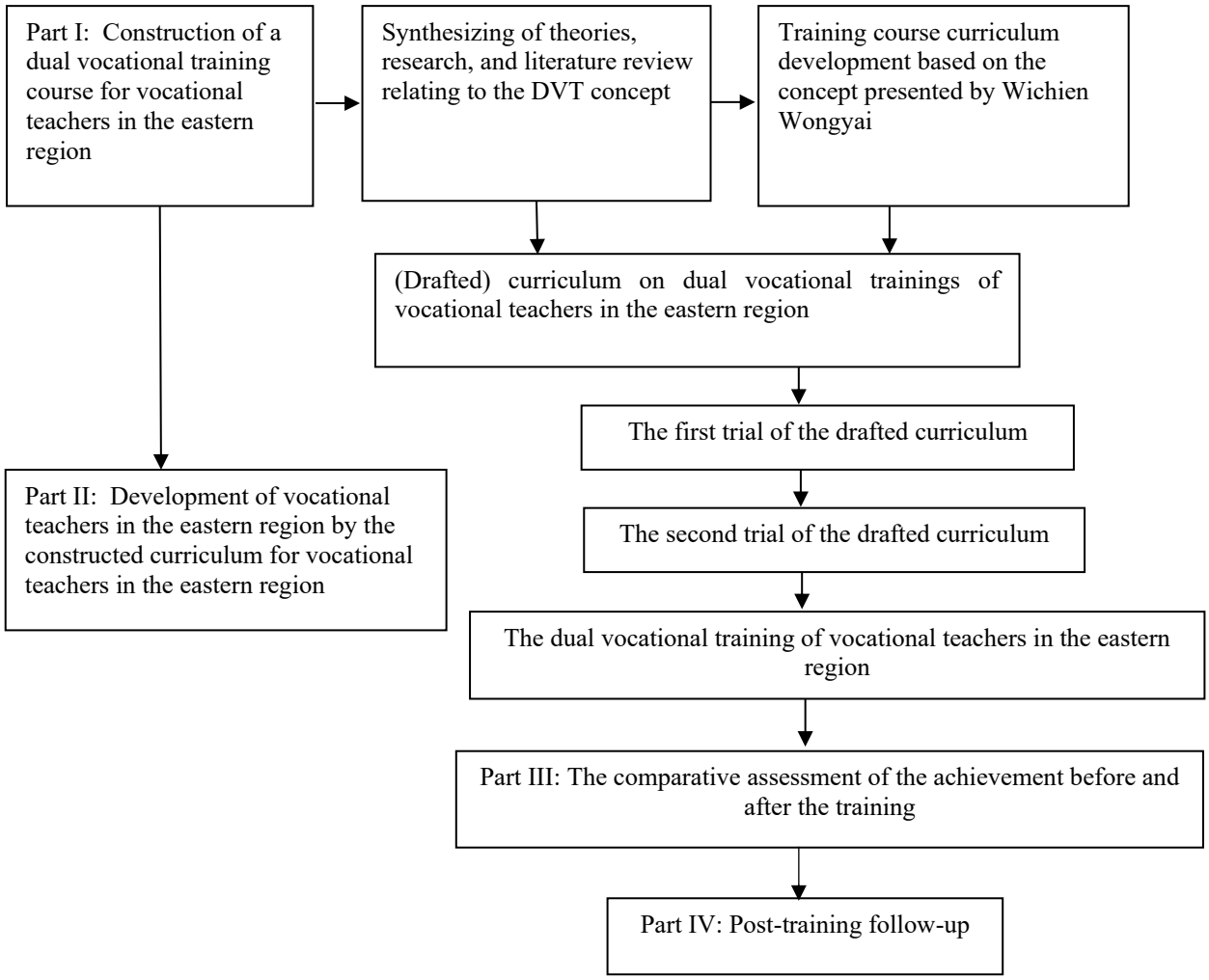


Figure 1 Conceptual framework

The researcher determined the scope of the study to include participants who were vocational teachers and personnel in vocational schools in the eastern region. Ultimately, 20 teachers and personnel in voluntary vocational schools, two participants from each school, were included in the study.

The content studied to prepare for the study consisted of DVT-based management for vocational teachers in the eastern region, documents relevant to DVT-based management, and then the construction of DVT for teachers in the eastern region.

The research variables of this study are an independent variable for the DVT curriculum for vocational teachers and another independent variable for the development of DVT for teachers and personnel in vocational schools in the eastern region.

Methodology

The author of this study chose the following research methodologies: 1) a literature review of theories and documents about the DVT concept, 2) study of DVT research, 3) construction of a training course curriculum for vocational teachers in the eastern region, 4) conducting the newly

constructed DVT training course for vocational teachers in the eastern region by means of the one group pre-test-post-test designs, and 5) post-training follow-up.

The detailed research procedures can be divided into the following two parts: Part I, the construction of a DVT course for vocational teachers in the eastern region, and Part II, the development of vocational teachers by applying the constructed DVT course for vocational teachers in the eastern region.

In Part I, the researcher applied the concepts of Wichien Wongyai (1994), who proposed integrated curriculum development, which was divided into three systems, i.e., the outline, implementation, and evaluation systems. These three systems are related to one another. First, the outline system used curriculum determiners that included basic information required for the construction of a curriculum, i.e., the information about DVT management for vocational teachers in the eastern region. Second, the curriculum design consisted of structures and components of the curriculum. Third, the curriculum quality inspection was a process where a feasibility study for the constructed curriculum was conducted. This step was carried out through a seminar attended by five experts from the Faculty of Education at Burapha University. The outcome of this step was used for the construction of a pilot curriculum. Finally, pre-implementation revision was carried out to ensure that a clear data system was created.

In Part II, the implementation system was comprised of three components, i.e., curriculum approval, implementation planning, and implementation. For curriculum approval, five experts were asked to review and consider approving the constructed training curriculum. For implementation planning, once the curriculum was approved, certain ways to implement the training from the approved curriculum were planned. The implementation component involved several processes, including public relations activities, preparation of vocational teachers in the eastern region, budgeting, training designs, and arrangement of the training schedule.

The evaluation system consisted of evaluation planning, data collection, and data analysis. For evaluation planning, the research determined certain areas that would require evaluation, such as curriculum documents, each sub-evaluation system, the acquired extent of achievement of the participants, and overall training curriculum assessment. The data collected were compiled and stored in different categories before being analyzed based on the set criteria. To analyze the data, key data for decision-making were determined. Data systematization helped categorize the data, which made to synthesize the data based on the set criteria. The researcher reported and presented the data and information, which would help determine whether the constructed curriculum is valuable as intended in the set objectives or if it would require further improvement.

The content used for the construction of the DVT for vocational teachers in the eastern region was the content obtained from the DVT-based management for vocational teachers in the eastern region, developed by the Office of Bureau of TVET Personnel Competency Development. The content consisted of the following areas: curriculum components, knowledge and skills, and teacher characteristics.

After the curriculum was determined, designed, and inspected in the feasibility study, the pilot curriculum was tested twice, first among five vocational teachers and then among 20 vocational teachers in the eastern region. The outcome was subsequently applied for further improvement. The following table describes the first test of the curriculum.

Table 1 Experimental Research Design: The One Group Pre-test Post-test Design.

Group	Pre-test	Treatment	Post-test
Experiment Group	T1	x	T2

Note: T1 refers to the pre-test, X refers to the experiment by means of the training course, and T2 refers to the post-test.

Experimental procedure

The researcher carried out the experiment with the following steps:

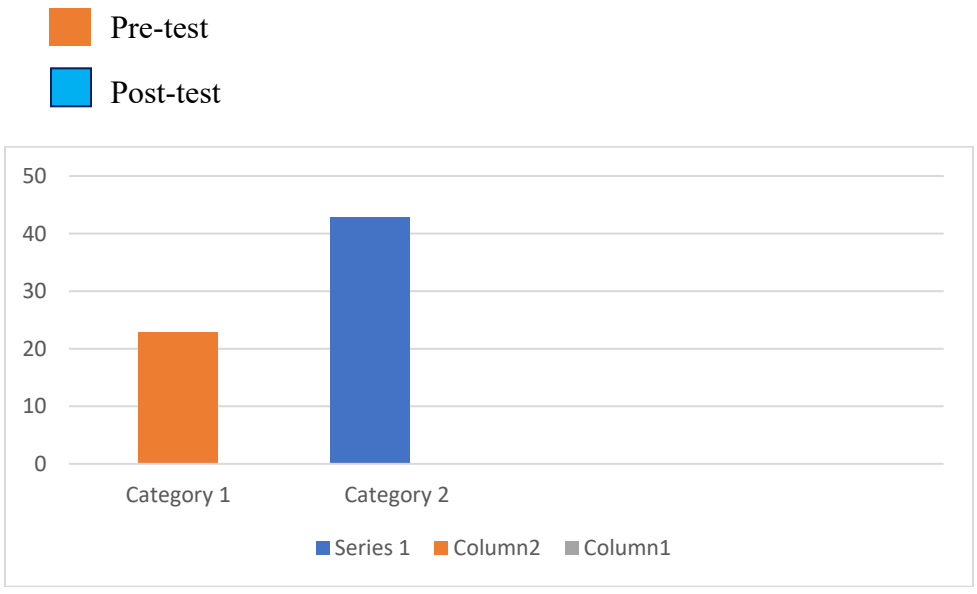
1. The participants completed the pre-test.
2. The participants attended the training, which was equipped with the supporting technologies.
3. The participants completed the post-test.
4. The training was evaluated by the evaluation form.

The statistical data used for data analysis include the following: 1) basic data: percentage, 2) mean and standard deviation, and 3) the *t*-test.

The researcher used the findings from the data analysis to construct the DVT course for vocational teachers in the eastern region. The content consisted of six aspects: 1) Development of Eastern Economic Corridors (EEC), 2) Promotion and Support of Industrial Development in the eastern region, 3) DVT Patterns, 4) Bilateral Collaboration Guidelines, 5) Evaluation, and 6) Supervision, Monitoring, and Evaluation.

After taking the constructed DVT course, the teachers were evaluated. E1 Efficiency refers to the efficiency of the means of the scores obtained from the test or during the DVT training for vocational teachers in the eastern region, and E2 Efficiency refers to the efficiency of the percentage mean score from the post-test. Note: E1/E2 = 80/80. The evaluation of the scores obtained during the training revealed that all participants passed. Additionally, the deviation of the scores obtained during and after the training course on DVT for vocational teachers in the eastern region showed that the E1 was equivalent to 83.88 and the E2 was at 85.8.

When comparing the development outcome from the training on DVT for vocational teachers in the eastern region before and after the training, it can be seen that the participants earned a mean score of 22.9 on the pre-test and a 42.9 mean score for the post-test. The result shows that the mean score from the post-test was higher than that from the pre-test, as seen in Figure 2.



able 2 below shows the analysis of the variance and the t-test of the pre-test and post-test of group.

Figure 2 Pre-test and post-test scores

Table 2 Variance and t-test of pre- and post-test group.

Group	n	$\bar{x}$	SD	df	**t	p
Pre-test	20	22.90	2.315	19	**27.033	.000
Post-test	20	42.90	2.382			

Note: *P < .001

The variance test for the pre-test and post-test scores resulted in the t at 27.033, the df at 19, and the significance (Sig) at .000. The results imply that the pre-test and post-test scores showed the statistical significance at .001.

Out of the 20 participants, eight were male, representing 40%, and 12 were female, accounting for 60 %. There were seven participants aged 46-50 years old (40 %). Of the participants, seven had 6-10 years of service ranged (35 %). Ten participants had earned master's degrees (50 %). Regarding the current position, nine participants (45 %) were currently teachers. Thirteen participants (65 %) were under the Office of the Vocational Education Commission (OVEC), and seven of them (35 %) were under the Bureau of Private Vocational Education Administration.

In regard to the extent of knowledge acquisition as well as opinions and recommendations after the training on DVT for vocational teachers in the eastern, the findings showed the mean at 4.01 and the standard deviation at 0.58.

The overall results showed high levels in all aspects, with the three highest levels as follows: 1) the expected benefits of the training revealed a mean of 4.30 and a standard deviation of 0.56, 2) regarding the degree to which the participants conveyed the knowledge acquired from the training in their teaching and the degree that the acquired knowledge helped develop their performance had a mean of 4.25 and a standard deviation of 0.54, and 3) in the area of teaching supervision, the mean was 4.25, and the standard deviation was 0.62.

The three lowest levels observed in the outcomes include the following: 1) the extent that the acquired knowledge was applied to the participants' actual implementation provided a mean of 3.70 and a standard deviation of 0.56, 2) the appropriateness of the duration of the implementation after the DVT had a mean of 3.75 and a standard deviation of 0.65, and 3) regarding the interim performance, the mean was 3.80, and the standard deviation stood at 0.68.

Research findings and discussion

The research findings suggest that the key success factors include a good collaboration of involved parties from both the policy and operation levels, strong partnership networks among educational institutes and occupational groups as well as relevant professional organizations, the leadership of executives of the educational institutes, potential and readiness of teams, support from the top management of educational institutions, and the organizational culture that an educational institution emphasizes. Other factors include the collaborations among partnership networks and collaborative systems, innovation and management to support and facilitate performance, innovations to manage knowledge, and support learners' self-learning in response to the new-normal learning. In addition, a variety of learning innovations should be developed. Interactions among teachers, training instructors from the business operators, and learners should also be emphasized.

Sangkwasi (2021), A guideline for the DVT management or operation should be established to elaborate the process toward the competency standard from the curriculum and the professional training plans based on the context and areas. Meanwhile, a system designed to

evaluate the competency of vocational learners under the DVT program should be emphasized and strengthened based on the curriculum and preferable characteristics essential in the professional world. Furthermore, close interactions among parents, learners, teachers, and training instructors at the business operators should also be highlighted by the supervision process. Innovations for DVT supervision in the new-normal circumstances should also be enhanced, with a focus on the development of necessary competency in the 21st century in order to develop preferable characteristics both during learning and training. Lastly, an evaluation to assess the extent of achievement of the DVT program should be developed based on the criteria for effective DVT management. Figure 3 shows an applicable guideline for DVT.

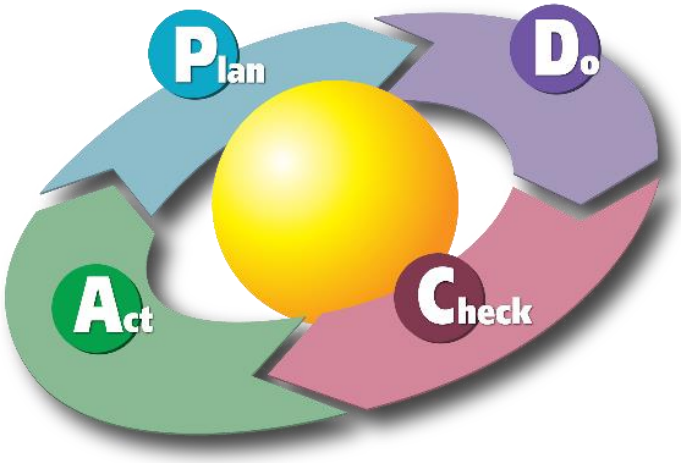


Figure 3 W. Edwards Deming – Big Ideas: PDCA (McInnis, 2014)

PDCA—"Plan–Do–Check–Act" or "Plan–Do–Check–Adjust"—is an iterative four-step management method used in business for the control and continuous improvement of processes and products. It is also known as the Deming cycle or "Plan–Do–Study–Act" (PDSA). The PDCA method was made popular by W. Edwards Deming, who is considered by many to be the father of modern quality control. The PDSA cycle was used to create the know-how transfer process model and other models. The meanings of the various steps are as follows:

1. PLAN: Establish the objectives and procedures required to deliver the desired results. According to the Bureau of TVET Personnel Competency Development (2014), in arranging the DVT program between an educational institute and a business operator, there should be 100%. Conversely, if there is no business operator in the area, all learners from all fields should be able to attend trainings in some other workplace further from their area, and accommodations should be provided for learners. In addition, some teachers should be assigned to supervise them. There should also be DVT management programs for some fields and for some employees of business operators.

2. DO: Measure the plan execution. Small changes are tested, and data is gathered to see the effect of the change. The business operators that participated in the DVT program emphasized that they are regarded as educational institutes for learners and that they are well-equipped to provide vocational trainings for learners in certain fields. They can provide supervisors and training instructors to cooperate, oversee, and instruct learners. They also provide an environment that is favorable to vocational trainings.

3. CHECK: Data compared to the expected outcomes, the testing process evaluated, and the data charted to see any trends. The data suggest that the DVT program requires effective

communication innovations to facilitate coordinating activities. A comprehensive operation guideline should be established, covering all processes, activities, steps, and indicators. The success of a DVT program should also involve effective coordination as well as motivation among involved parties. In addition, both parties should be aware of facts regarding work from both sides, especially problems, obstacles, and limitations, in order to determine flexible solutions as well as establish a strong monitoring system and a learner selection process. The involved business operators should motivate learners and stimulate interactions and communication during the training. All parties should share knowledge, be mutually responsible, and help to adjust or solve problems or limitations. There should be knowledge management among all players, both from the educational institutes and business operators.

4. ACT/ADJUST: The process improved, in which information gleaned from the "DO" and "CHECK" stages help identify issues and gaps with the process. These issues may include problems, non-conformities, opportunities for improvement, and inefficiencies. Root causes of such issues are investigated, found, and eliminated by modifying the process. Work in the next DO phase should not create a recurrence of the problems identified; if it does, then the action was not sufficient.

To develop personnel and enable them to perform effectively, it is necessary that they are trained to be more skillful and possess knowledge, with the capability to directly meet demand from business operators. This will enable the business sector to prepare potential personnel to fill in any vacancies during the time of labor shortage in the future. Teachers who provide vocational training under the DVT program should be those in certain professions, such as engineers, technicians, or specialists in particular fields. They should possess extensive knowledge in the particular fields where learners attend the training. They should also have good personalities and hold a positive attitude toward conveying their knowledge to others. They should be able and available to participate in seminars with content or knowledge on DVT.

In conclusion, factors and key points that would contribute to the success of a quality DVT program management in Thailand include an emphasis on the significance of the selection of suitable business operators whose businesses relate to the professional fields taught in educational institutes, a mutual system to take care of learners, and collaborations from all involved parties at all levels and sectors. Meanwhile, there should be a collaboration management committee that oversees the DVT program, covering both management and operation levels. There should also be management, supervisory, and follow-up systems.

Meetings should also be regularly arranged. Collaborations with various business operators should also be strengthened. Meanwhile, only quality business operators should be selected to join the program. The work system should be highly flexible. All parties should gain some synergy benefits and utilize mutual resources based on the learning and training plans. Related parties should collaborate with relevant organizations to determine professional standards and related agencies. Teachers should be given more opportunities to enhance their direct work experiences from the workplace, where those who perform certain professions may help convey their knowledge and first-hand experiences in particular professions. Hence, training instructors' skills should be developed to the extent that they gain an in-depth understanding of the DVT system. Business operators should also take part in pre-training preparations to facilitate planning on learning and trainings, general preparations, and leaners' adaptation. Furthermore, more procedures to create awareness and understanding among parents should be established in collaboration with the business operators. Learners should be able to learn and enhance their competency as well as their ability to use modern equipment or devices. Business operators should

gain the opportunities to recruit existing students under the DVT program. Students who have completed the trainings must be required to demonstrate their efficiency and pass the required professional standards.

The researcher hopes this study benefits educational institutes, business operators, and related agencies. All involved parties should apply knowledge and recommendations for quality DVT management to drive the DVT program in Thailand. All acquired knowledge and recommendations are expected to lead to actual implementation for a potential concrete outcome.

Recommendations

Suggestions for applying research

1. Establish a national committee or the National Dual Vocational Education Promotion Council to integrate the work of related agencies.

2. Promote and support teachers and trainers in the industrial sector to work together in creating a system for exchanging knowledge in work knowledge, technology, and modern career innovation according to the changing context in the business sector.

3. Develop a model for evaluating the competency of Dual Vocational Education, with participation between educational institutions, the business sector, and occupational standards supervision agencies.

Suggestions for future research

1. Research on strengthening the dual vocational education system.

2. Research on the supervision of the dual vocational education system according to specified standards.

3. Research on organizing participatory learning systems.

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