



The efficiency of an evaluation model for undergraduate vocational education programs: An application of multiple evaluation approaches

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Abstract

This research aimed to assess the efficiency of an evaluation model for undergraduate vocational education programs, which was developed from the application of multiple evaluation approaches. There were three-evaluation approaches, namely: (1) Utilization-focused evaluation; (2) CIPIEST evaluation model; and (3) Discrepancy evaluation model. The evaluation was tested in two different courses: (1) a Bachelor of Technology Program in Electrical Technology; and (2) a Bachelor of Technology Program in Office Management. The sample was of 12-curriculum evaluation committee members from both programs. An evaluation form of the program evaluation model and focus groups records were used as the research instruments for the data collection. The data were analyzed by descriptive statistics and content analysis. The results found that according to the components and evaluation indicators as required, both programs were completed. Five standards for the efficiency of the evaluation model were: (1) utility standards; (2) feasibility standards; (3) propriety standards; (4) accuracy standards; and (5) evaluation accountability standards. The results indicated that the most effective standard was utility standards, corresponding with the opinions of the committee from the focus group meetings.

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Introduction

The government and private sectors of Thailand have made efforts to upgrade vocational education. Moreover,

they have promoted a dual vocational education and encouraged more vocational learners to meet the manpower needs of the labor sector, which affects the overall development of Thailand. Therefore, it is imperative to strengthen the vocational education management system (Ruanthai et al., 2021; Sritrakul & Chantara, 2019).

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The Bachelor's Degree of Technology program is offered by Vocational Education Institutions under the supervision of the Office of the Vocational Education Commission (OVEC). This program is a new mission to develop professional workers at the skill level, technical level, and technology level, and upgrade professional education to reach the demands of the labor market. In general, the number of students has increased in vocational education at the bachelor's degree level in Thailand because the undergraduate vocational program is a bilateral study system whereby students can work and earn a salary while studying. After graduation, there is support to work with the establishment. This is different from the general bachelor degree program (Office of the Education Council, 2020; Ruanthai et al., 2021; Sritrakul & Chantara, 2019). Thai Qualification Framework for Vocational Education: Bachelor Degree of Technology 2013 requires vocational institutions to provide assessments to continuously develop curriculum under their responsibilities at least every 5 years (Office of the Vocational Education Commission, 2015). The development of a vocational education program at the bachelor's level must comply with the Standard Criteria for Thai Higher Education, Standard Criteria for Thai Vocational Education, and Professional council (Sritrakul & Chantara, 2019).

Most recent assessments of vocational programs found that the personnel lack knowledge and understanding of course assessment, which can cause the assessment design to lack standards. The methods of data collection and the instruments were inconsistent with the nature of the course's operations and did not cover the required information. Finally, the assessment results were not actually used in curriculum development (Theerarojanapong & Nongkhunsan, 2018; Wongruksa et al., 2021). To develop this curriculum assessment model, multiple evaluation approaches were applied because of their perspectives on theory and practice, which have various dimensions of data analysis, methods, and data. They were put together in accordance with diverse and complex projects to provide the necessary in-depth information and cover more assessment dimensions (Bledsoe & Graham, 2005; Costa et al., 2013; Greene et al., 2001). This corresponded to the information needs of the curriculum assessment and problems of evaluating undergraduate vocational courses by integrating 3 assessment concepts, namely: (1) Utilization-Focused Evaluation (Patton, 2013); (2) CIPIEST Evaluation model (Stufflebeam, 2015); (3) Discrepancy Evaluation model (Provus, 1969). According to the strengths of each concept, the objectives of the evaluation model developed were: (1) to assess the

inputs, operation process, short-term outcomes, and long-term outcomes of the program; and (2) to analyze weaknesses and strengths of undergraduate vocational courses.

Therefore, the researcher was interested in assessing efficiency of an evaluation model for undergraduate vocational education programs: An application of multiple evaluation approaches. The benefits for Thai vocational education are executives of the Institute of vocational education and the instructors in charge of the curriculum have an effective curriculum assessment model. Moreover, the results can provide information from the assessment that covers the context of the course and needs of all stakeholders to be used in considering the improvement of the curriculum educational management in accordance with the standards set by the relevant agencies and the needs of the establishment.

Literature Review

Vocational Education in Thailand

Technical and Vocational Education and Training (TVET) in Thailand offers three qualifications: Vocational Education Certificate, Technical Diploma, and Bachelor Degree of Technology under the supervision of the Office of the Vocational Education Commission (OVEC). (Office of the Education Council, 2020)

1. Vocational Education Certificate is a three-year program at upper secondary level (grades 10 to 12) for those who have completed nine years of education or lower secondary education.

2. Technical Diploma is provided for those who have completed Vocational Education Certificate or general upper secondary education (grade 12). It is a two-year program (grade 13 and 14) with more specialized areas of occupation.

3. Bachelor Degree of Technology is offered by Vocational Education Institutions. It is a two-year program that follows completion of the Technical Diploma. This program is mainly designed for those who are employed in enterprises and want further education at a higher level.

Philosophy and objectives of vocational education in a Bachelor of Technology Program (continuing program) aim to be in accordance with the national economic and social development plan, national education plan, vocational philosophy and vocational education standards or competency standards. Moreover, they focus on producing knowledgeable and competent learners in practicing and developing works at the technology level. Therefore, the curriculum used in teaching and studying is a competency-based curriculum, emphasizing

dual vocational training, that is from the agreement between a vocational institution and an enterprise, state enterprise or government agency in organizing the curriculum of teaching measurement and evaluation (Office of the Vocational Education Commission, 2015).

Multiple Evaluation Approaches

The multiple evaluation was the integration of two or more different evaluation approaches used as a basis for designing an appropriate evaluation guideline to the program context and generate comprehensive findings. Such obtained in-depth information that is necessary to make value judgments and next decisions. (Bledsoe & Graham, 2005). According to the selection of evaluation concepts, the evaluator should have three considerations (Hansen & Vedung, 2005): (1) the purpose of evaluation; (2) the characteristics of evaluation; and (3) the problem to be solved.

The multiple concepts were applied in the evaluation model for undergraduate vocational programs. The three approaches are described as follows.

1. The CIPIEST evaluation model (Stufflebeam, 2015) is a concept of decision-based evaluation to review and improve a program or course. The assessment consists of 7 dimensions: (1) context; (2) input; (3) process; (4) impact; (5) effectiveness; (6) sustainability; and (7) transportability. Therefore, it can be applied in the design of curriculum assessments. It was used in the setting of curriculum assessment objectives and determining the components and indicators of curriculum assessment. According to the seven assessment dimensions, the assessment covered the required information and was related the course implementation. It is consistent with the aim of applying the assessment results in all aspects.

2. Discrepancy evaluation model (Provus, 1969) is a concept of the criterion-based evaluation. It was used to assess inconsistencies between different sections of the curriculum, such as course design, the initiation of the course, its processes, its productivity, and its worth, and standards in accordance with the higher education curriculum standards to find weaknesses and lead to decision making. To obtain information to judge the effectiveness/efficiency of the course and find points that should be developed according to the criteria, it is applied in the formulation of curriculum assessment criteria. Moreover, to obtain information from the assessment of courses that are consistent with the needs of the stakeholders, a course worth judging is a comparison of operating conditions with course benchmarks.

3. Utilization- Focused Model (Patton, 2013) is a concept of the naturalistic evaluation approaches to provide information to users and promote the use of assessment results. It helps build assessment knowledge for those in charge of the course, and make the assessor, person in charge of the course and all stakeholders understand the context of curriculum administration. Teaching and learning are in the same direction in order to apply the information from the assessment to develop curricula according to the needs of enterprises and government policies. Therefore, it can be applied to analyze the context of the curriculum, the needs of the establishment, all stakeholders, and those who want to use the information and plan to use the assessment results appropriately, which is in the first step and the final step of the course assessment.

In conclusion, these three concepts were combined to collect data and synthesize the results to come up with a common finding (Kanjanaawasee, 2019).

The Program Evaluation Standards

Evaluation standards are generally accepted, which is a standard set by the joint committee on standards for educational evaluation under the direction of Stufflebeam et al., 2015 to be the norm of the evaluation activities. In 2011, the joint committee on standards for educational evaluation revised the program evaluation standards and their new evaluation was divided into five standards, including: (1) utility standards; (2) feasibility standards; (3) propriety standards; (4) accuracy standards; and (5) evaluation accountability standards, which are recommended to the evaluator for academic application (Yarbrough et al., 2011), which is consistent with Stufflebeam (2015) recommending the revised evaluation standard for the meta evaluation of the CIPIEST evaluation model.

The researcher's literature review brought about the framework for the development of the evaluation model for undergraduate vocational education programs: The aims of applying each evaluation approach were to bring: (1) CIPIEST evaluation model to define components and indicators of course evaluation; (2) Discrepancy evaluation model to define course evaluation criteria in the data analysis and identify weaknesses and strengths of the courses in the evaluation report; and (3) Utilization-focused evaluation to identify users of the course evaluation results in the evaluation method and select the most effective way to implement the evaluation results at the final stage of the assessment. The main concept was as shown in [Figure 1](#).

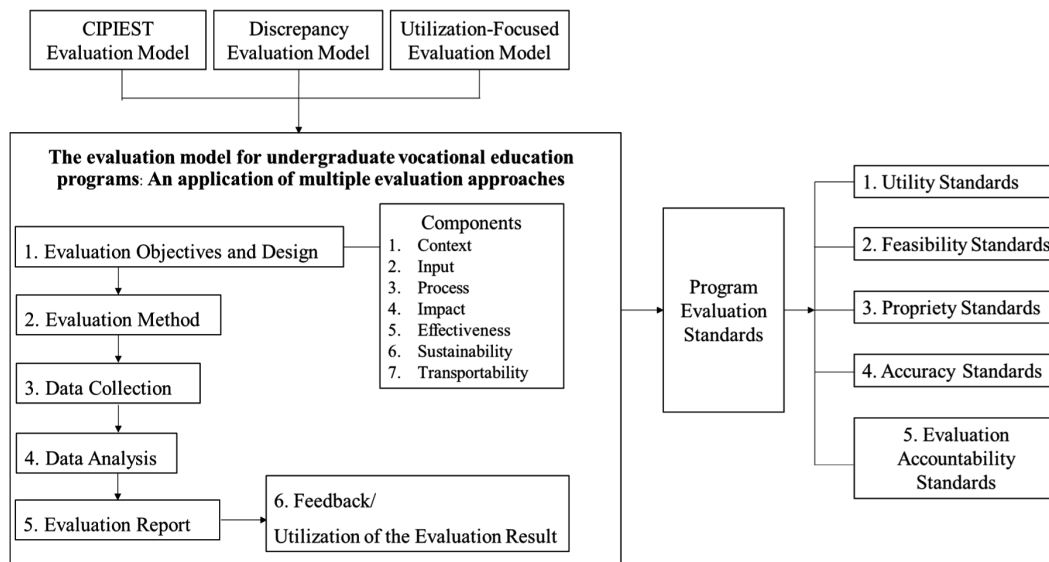


Figure 1 The development of an evaluation model for undergraduate vocational education programs: An application of multiple evaluation approaches

Methodology

The developed evaluation model was tested in two different programs: (1) A Bachelor of Technology Program in Electrical Technology; and (2) A Bachelor of Technology Program in Office Management in academic year 2019, by different operating contexts, to evaluate the efficiency of this developed curriculum evaluation model.

Participants

Key informants in this research were 12–curriculum evaluation committee members including institutional administrators and instructors in charge of the program, who had tested the evaluation model in undergraduate vocational education programs at both institutions.

Data Collection

1. The data were selected for the following reasons: (1) It was a course that corresponded to the demands of the labor market, and had the most students enrolled in 2 courses, namely, industry (Electrical Technology) and Business Administration (Office management); and (2) It was an institute of vocational education that had been teaching since 2013 and had graduates in two institutes with different contexts.

2. The researcher brought the developed evaluation model to tryout in both institutes. There was a clarification meeting to build an understanding of the developed evaluation model to the curriculum evaluation committee, including institutional administrators and instructors in charge of the program.

3. Curriculum evaluations were conducted by committee members based on the required procedures, components, indicators, and instruments. The curriculum evaluation report was sent to the researchers. The total duration of the evaluation was approximately 2 months.

4. The curriculum evaluation committee and those involved in the course attended the meeting to evaluate the efficiency of the curriculum evaluation model and gave recommendations on the evaluation model in both vocational institutions.

Instrument

1. The tryout of the developed evaluation model of undergraduate vocational education programs consisted of two tools as follows:

1) The curriculum evaluation guideline applied multiple evaluation approaches developed by the researcher. After considering the suitability and feasibility of nine experts, including curriculum and instruction, evaluation and research, vocational education, it was found that the mean was between 4.00–4.89 from the five-point rating scale.

2) Evaluation forms and records, which consisted of checklist, five-point rating scale and open-ended questions and passed the content validity from nine experts, including curriculum and instruction, evaluation and research, vocational education, found that the IOC (Item Objective Congruence) value range was from 0.67–1.00.

2. The efficiency of the curriculum evaluation model for undergraduate vocational education programs consisted of two tools as follows:

1) The efficiency evaluation form of the evaluation model for undergraduate vocational education programs was developed by the researcher and the application of the program evaluation standards of the joint committee on standards for educational evaluation (Yarbrough et al., 2011), including utility standards, feasibility standards, propriety standards, accuracy standards, and evaluation accountability standards. The evaluation form had closed-ended questions. It was found that the IOC value range was from 0.56–1.00 to gather quantitative data from the curriculum evaluation committee on the effectiveness of the developed curriculum assessment model.

2) A focus-group record form, including semi-structured questions, was used to collect qualitative data from the curriculum evaluation committee and those who were involved in the effectiveness of the developed curriculum assessment model.

Data Analysis

Data Analysis in this research contains both quantitative data and qualitative data. The data were analyzed as follows:

1. Quantitative data from the evaluation form of the evaluation model for undergraduate vocational education programs were analyzed by calculating the average and the standard deviation of the feedback score.

2. Qualitative data from focus groups records related to the appropriateness and efficiency of the evaluation model, and suggestions for improvement of the evaluation model.

Results

1. The results of the efficiency of the evaluation model for the undergraduate vocational education program, applied the multiple evaluation approaches based on the program evaluation standards. It was found that the standards with the highest average of feedback were utility standards ($M = 4.45$, $SD = 0.46$), and the standards with the lowest average of feedback were evaluation accountability standards ($M = 4.31$, $SD = 0.42$). Moreover, it was found the item with the highest average was fiscal responsibility ($M = 4.79$, $SD = 0.40$), and the item with the lowest average was Explicit Evaluation Reasoning ($M = 4.08$, $SD = 0.51$). The details are shown in Table 1.

Table 1 Mean, standard deviation, efficiency of evaluation model of the bachelor vocational curriculum evaluation model by the multiple evaluation approaches

			($N = 12$)
The program evaluation standards		Mean	SD
1. Utility Standards		4.45	0.46
1.1 Evaluator Credibility		4.61	0.47
1.2 Attention to Stakeholders		4.17	0.54
1.3 Negotiated Purposes		4.58	0.53
1.4 Explicit Values		4.46	0.54
1.5 Relevant Information		4.50	0.56
1.6 Meaningful Processes and Products		4.38	0.48
1.7 Timely and Appropriate Communicating and Reporting		4.42	0.67
1.8 Concern for Consequences and Influence		4.33	0.58
2. Feasibility Standards		4.35	0.41
2.1 Project Management		4.46	0.66
2.2 Practical Procedures		4.29	0.45
2.3 Contextual Viability		4.21	0.54
2.4 Resource Use		4.46	0.50

Table 1 Continued

		(N = 12)	
The program evaluation standards		Mean	SD
3. Propriety Standards		4.45	0.52
3.1 Responsive and Inclusive Orientation		4.25	0.50
3.2 Formal Agreements		4.38	0.71
3.3 Human Rights and Respect		4.50	0.67
3.4 Clarity and Fairness		4.54	0.62
3.5 Transparency and Disclosure		4.46	0.58
3.6 Conflicts of Interests		4.46	0.58
3.7 Fiscal Responsibility		4.79	0.40
4. Accuracy Standards		4.35	0.51
4.1 Justified Conclusions and Decisions		4.54	0.62
4.2 Valid Information		4.33	0.57
4.3 Reliable Information		4.38	0.53
4.4 Explicit Program and Context Descriptions		4.42	0.67
4.5 Information Management		4.47	0.59
4.6 Sound Designs and Analyses		4.42	0.67
4.7 Explicit Evaluation Reasoning		4.08	0.51
4.8 Communication and Reporting		4.13	0.53
5. Evaluation Accountability Standards		4.31	0.42
5.1 Evaluation Documentation		4.14	0.54
5.2 Internal Meta-evaluation		4.54	0.50
5.3 External Meta-evaluation		4.33	0.39

2. The results of considering the appropriateness of the evaluation model, and recommendations from the focus group are summarized as follows:

1) Appropriateness of the evaluation model: This curriculum evaluation model was appropriate in accordance with the context of vocational education. It was practical and reflected the performance of the organization. Therefore, the results of the evaluation were brought to develop the curriculum to be more effective.

2) Suggestions for the development of the curriculum evaluation model: Indicators regarding the recruitment and selection of new instructors should be eliminated because some institutions were unable to accept teachers themselves. Moreover, the curriculum evaluation instruments might be available both online and in documentation to suit all informants.

Discussion

The efficiency of the evaluation model for undergraduate vocational education programs by applying the multiple evaluation approaches was based on the program evaluation standards in five items. It was found that the most effective standards were utility standards, according to the results of the focus group meetings. The curriculum evaluation committee of each program found that the evaluation model was appropriate and consistent with the context of vocational education. It was practical and reflected the performance of the organization. Therefore, the results of the evaluation can be used to develop the curriculum to be more effective because the researcher developed a model from the theoretical concept, and the results of the interviews with the stakeholders and the focus group of instructors in all disciplines resulted in feedback. This led to the development of an effective model in accordance with the vocational education management context. Ruanthai et al. (2021) found that the results of the assessment of the dual vocational

training system at the bachelor's level or the operation program of vocational institutions were accuracy, suitability, feasibility, and the usefulness, which were at the highest level. They focused on model development from all stakeholders and related theories. Therefore, the aim of Utilization-focused evaluation (Patton, 2013) was to focus on defining the intended user and the need for evaluation results in the evaluation design process in order to be able to use the assessment results to be appropriately utilized in the context of the project.

Advantages of the curriculum evaluation model:

(1) It is a curriculum evaluation model that focuses on providing comprehensive information covering all parts of the operation and outcomes that occur both in the short and long term. It can help to get the information for decision-making to develop the curriculum for all stakeholders; and (2) this evaluation model compiled with indicators from the higher education curriculum standards (Office of Higher Education Commission, 2015) and standards for Bachelor of Technology Program (continuing program). Thus, it can track and comprehensively reflect the implementation of the curriculum. Srirakul and Chantara (2019) found that the uniqueness of the development or improving the undergraduate vocational education program must combine 3 components; Thai Qualification Framework for Higher Education, Thai Qualification Framework for Vocational Education, and Professional council to produce graduate practitioners who can apply the philosophy to work.

Limitations of the evaluation model: (1) From a lot of information of the curriculum evaluation model, the components and indicators are very detailed, and the data is collected from a wide range of contributors. People who brought this curriculum evaluation model must have a good understanding of all the details. According to Bledsoe and Graham (2005); and Patton (2013), the use of multiple evaluation approaches and other assessment concepts required the assessment knowledge for stakeholders to understand assessment concepts sufficiently.

Conclusion and Recommendation

The instructors in charge of the program evaluated the efficiency of an evaluation model for undergraduate vocational programs. They evaluated the efficiency of the curriculum model based on the program evaluation standards. All five standards had a very high average of course evaluation committee opinions, and the aspects

with the highest average were utility standards and propriety standards. Moreover, from the focus group meetings of each course of the curriculum evaluation committee, it was found that this curriculum evaluation model was appropriate in accordance with the context of vocational education. Moreover, it was practical, and reflected the performance of the organization. Therefore, the results of the evaluation were used to develop the curriculum to be more effective. Some recommendations are that indicators regarding admissions and selection of new instructors should be eliminated because some institutions are unable to accept teachers themselves. Additionally, the format of the evaluation tool may be available both online and in documentation to suit all groups of informants.

Conflict of Interest

There is no conflict of interest.

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