Higher Education Studies; Vol. 15, No. 1; 2025
ISSN 1925-4741 E-ISSN 1925-475X
Published by Canadian Center of Science and Education

Teaching Competency Development Model of Instructor in Bachelor of Technology Degree in Automotive Technology Program for Institute of Vocational Education

Witoon Huankhoksung[1], Ophat Sukwan[1] & Chakrit Ponathong[1]

[1] Faculty of Education, Srinakharinwirot University, Bangkok, Thailand

Correspondence: Witoon Huankhoksung, Faculty of Education, Srinakharinwirot University, Bangkok, Thailand. E-mail: witoon.hks@g.swu.ac.th

Received: November 24, 2024 Accepted: December 17, 2024 Online Published: December 18, 2024

doi:10.5539/hes.v15n1p160 URL: https://doi.org/10.5539/hes.v15n1p160

Abstract

Providing higher education is crucial for the development of human resources. This research aims to develop a model for developing teaching competencies of teachers in the Bachelor of Technology Program in the Automotive Technology Department, Institute Vocational Education. Research and Development was divided into 3 phases: Phase 1 to study the conditions, problems, and approaches to developing teaching competence of teachers, using in-depth interviews with 10 teachers and 5 Experts. Phase 2 develop a model for developing teaching competence of teachers, using group discussions with 10 experts; and finally, Phase 3 to study the effectiveness of the Teaching Competency Development Model. A model for developing teaching was the development of the 4K4C+KCV Competency Development Model for teachers in the Automotive Technology program at vocational institutes. This model includes three basic components (KCV): Knowledge, Competencies, and Values, while the process of developing teaching competency comprises four steps (4K4C): 1. Know with understanding - Create knowledge by yourself, 2. Know in detail - Create cooperation, 3. Know with expertise - Create coordination, 4. Know to advise - Create work and leadership roles. The quality of the teaching competency development model it found high level. The overall quality of the teaching competency development model for teachers in the Bachelor of Technology Program in Automotive Technology at the Institute Vocational Education is at a high level.

Keywords: Development Model, Teaching Competency, Automotive Technology, Institute of Vocational Education

1. Introduction

Higher education provision is crucial for the development of human resources. This is due to the fact that human development must produce teachers who are of a caliber that satisfies the demands of the industry and the education sector. To deliver high-quality instruction, teachers should strive to possess competencies relevant to their line of work. by the 2017–2027 National Education Plan. The Ministry of Education's policy on educational management Strategy 2 states that in order to increase the nation's competitiveness, human resources, research, and innovation must be developed (Ministry of Higher Education, 2018). Developmental guidelines Create and cultivate human capital with competencies in areas that satisfy the demands of the labor market and the economic and social advancement of the nation. Encourage the development and production of skilled workers in particular fields.

Therefore, a framework for the advancement of the higher education system is provided by the Policy and Strategy Framework for Higher Education, Science, Research, and Innovation 2023–2027. Vital national research, science, and innovation to advance integration It is possible to steer national development in the direction of the national strategy. Government policies and master plans. such as the goal of enhancing Thailand's capacity for higher education, science, research, and innovation. Changing the nation to promote quick and sustainable development Increase competitiveness by having a value-generating economy that is prepared for the future. There are important strategies used to drive operations. From Strategy 4: Human resource development higher education institutions and research institutes as a base for driving the country's economic and social development in a progressive and sustainable manner. During the year 2012 - 2013, the

Ministry of Education Announcement of ministerial regulations for educational institutions under the Office of the Vocational Education Commission to merge (Ministry of Higher Education, 2023). To establish an institution of higher education, Produce professional personnel with expertise and expertise to enter the labor market. The vocational education institutions are divided into 2 types: 1) 19 vocational education institutes 2) 4 agricultural vocational education institutes. All programs offered use the standard framework for vocational qualifications at the vocational certificate level. Vocational qualification standards at the higher vocational certificate level and Vocational qualification standards for bachelor's degrees in technology or operations. Emphasis is placed on organizing formal education and the bilateral system. Vocational education institutions must prepare in terms of buildings, equipment, teaching staff, and educational personnel. To be appropriate and sufficient to develop students with quality especially educational personnel Teachers must have qualifications according to the criteria set by the Vocational Education Commission.

In order to provide a model for enhancing the teaching competency of instructors in the Technology Graduate Program, the researcher is therefore interested in conducting research. The Vocational Education Institute's Automotive Technology branch will create a model for enhancing teachers' instructional skills. The model can serve as a development model roadmap. Teachers are receiving training to become more skilled educators in the Automotive Technology branch of the Vocational Education Institute's Bachelor of Technology program.

2. Methods

2.1 Study Design and Participants

The Research and Development study was conducted using an intervention group at the Automotive Technology branch, the Vocational Education Institute Thailand. The research is divided into 3 phases as follows:

Phase 1; To study the conditions, problems, and approaches to developing teaching competence of teachers, using in-depth interviews with 10 teachers and 5 teachers.

Phase 2 To Develop a model for developing teaching competence of teachers, using group discussions with 10 experts

Phase 3 to study the effectiveness of the Teaching Competency Development Model. The sample size of the study was Thirty teachers from the Vocational Education Institute's Automotive Technology branch were chosen for the study's sample size using purposive sampling.

2.2 Ethical Considerations

This research project was considered and certified by the Institutional Review Board on Research Involving Human Subjects, Srinakharinwirot University, Project Code: SWUEC-662204 on May 2023. Participants provided informed consent.

2.3 Data Analysis

Data was analyzed using SPSS 22; Descriptive statistics

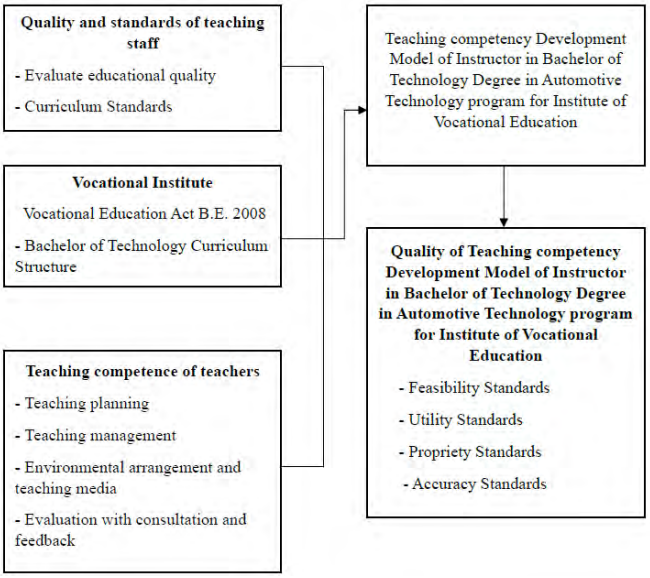

Figure 1. Conceptual Framework

3. Results

Phase 1 *To study the conditions, problems, and approaches to developing teaching competence of teachers, using in-depth interviews*

Problems and developing the teaching competency of teachers in the Bachelor of Technology Program in Automotive Technology. Vocational education institute.

Course Planning: It was discovered that teachers' lesson plans were divided into two sections: the first year is lesson plan for college coursework through both theoretical and laboratory-based learning. The second year, students are required to complete a year of training in an establishment under the supervision of an instructor who serves as the instructor. Teachers are responsible for overseeing the work. by having the training teachers assess and assign grades in conjunction with the supervisory teachers, and by having the students themselves evaluate. The problem encountered is that the teacher's supervision period is too short.

Learning management: The teachers lack experience in teaching specialized professions regarding modern automotive technology, such as electric vehicles, and specialized mechanical aspects within factories. In addition, teachers still use similar teaching methods for both levels in Vocational Certificate and Bachelor's Degree because the instructors are still teaching at both levels.

Environment and Media: It was found that the environmental conditions were appropriate for learning according to the area of the college. In terms of teaching media, most are sufficient for teaching. Classrooms and teaching equipment are adequate.

Measurement and evaluation with consultation and feedback: It was found that teachers evaluated the teaching and learning according to the criteria and according to the course competency framework determined from the course description. In terms of advising, it was found that teachers and advisors should be friendly in giving advice and have various contact channels between students and advisors. Including opening channels for receiving feedback from students and instructors.

Phase 2 *To Develop a model for developing teaching competence of teachers Figure 2*

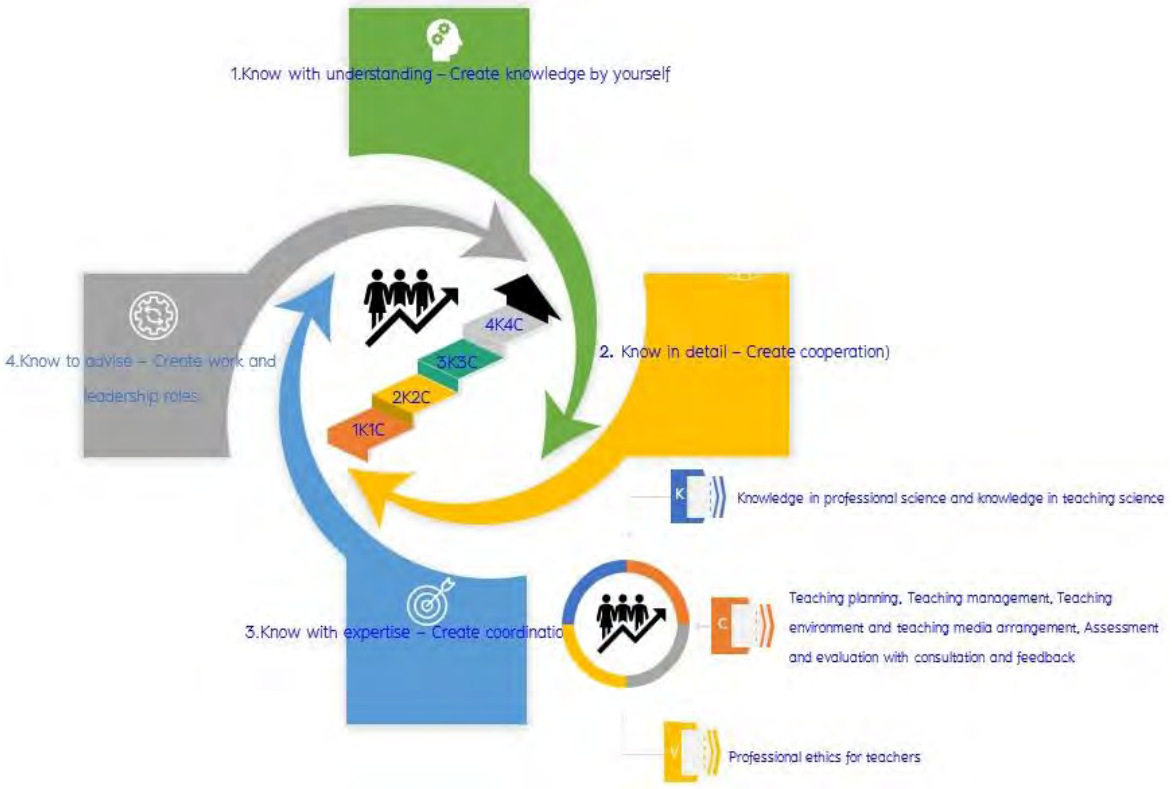

Figure 2. 4K4C+KCV Teaching Competency Development Model

Teaching Competency Model of Instructor in Bachelor of Technology Degree in Automotive Technology program, Vocational Education (4K4C+KCV Teaching Competency Development Model) Consisting of the following details:

1. Basic components of teaching competency development (KCV)
   1.1 Knowledge in professional science and knowledge in teaching science.
   1.2 Teaching Competency; Teaching and learning planning, organizing teaching and learning, arranging environmental conditions and teaching media, measuring and evaluating along with providing advice and feedback.
   1.3 The Values and Professional Ethics of Teachers.
2. Steps for learning teaching competency (4K)
   2.1 Know with understanding.
   2.2 Know in detail.
   2.3 Know with expertise.
   2.4 Know to advise.
3. Steps for enhancing teachers' teaching competencies (4C)
   3.1 Create knowledge by yourself.
   3.2 Create cooperation.
   3.3 Create coordination.
   3.4 Create work and leadership roles.

Phase 3 *To study the effectiveness of the Teaching Competency Development Model.*

The Effectiveness of the Teaching Competency Development Model (4K4C+KCV Teaching Competency Development Model) found that: Overall, it was at a high level ($\bar{X}$ 4.48, S.D.0.60), Utility is at the highest level ($\bar{X}$) 4.62, S.D.0.60), and the Propriety is at lowest level ($\bar{X}$ 4.39, S.D. 0.66) Table 1

Table 1. Quality of the 4K4C+KCV Teaching Competency Development Model for teachers in the Bachelor of Technology Program in Automotive Technology, Vocational Education Institute

Quality of 4K4C+KCV Teaching Competency Development Model	$\bar{X}$	Percentage	S.D.	Meaning
1. Feasibility	4.47	89.33	0.58	High
2. Utility	4.62	92.40	0.60	Highest
3. Propriety	4.39	87.87	0.66	High
4. Accuracy	4.49	89.87	0.55	High
Overall	4.48	89.50	0.60	High

4. Discussion

The overall quality of the 4K4C+KCV Teaching Competency Development Model for teachers in the Bachelor of Technology Program in Automotive Technology at the Institute Vocational Education is at a high level. The utility is at the highest level because it is beneficial to self-improvement. The accuracy is high level because the content is consistent with the objective. The feasibility is high level because it is consistent with current teaching and the propriety is high level because the content is appropriate for the teacher. This study was consistent with previous studies it was found that the results of evaluating the usefulness of the vocational education management model for the graduate technology curriculum according to the guidelines for integrating learning with work were found that Overall, it is useful at the highest level (Pliandist, 2023). The high level of teaching competency development model for teachers in the Bachelor of Technology Program in Automotive Technology significantly influences student learning outcomes. This model enhances the quality of instruction, which is crucial for vocational education, particularly in the automotive field. Teachers with dual expertise in both teaching and industry practices can better prepare students for real-world challenges, leading to improved student capabilities (Widayana et al., 2022). It was consistent with previous studies it was found that implementing a partnership-based training model has shown to elevate teacher competencies, with 80% of participants achieving good criteria in attitudes, knowledge, and skills (Sudarsono et al., 2021). In addition, the teacher Interpersonal Behavior: Positive teacher behaviors, such as cooperation, significantly boost student motivation, particularly in competence-based learning environments (Misbah et al., 2021). And a supportive learning environment fosters better student engagement and perceived competency, which correlates with higher achievement levels (Prihantoro et al., 2019). This iterative process is crucial for adapting to the fast-paced changes in automotive technology, thereby preparing students for future challenges (Dorp et al., 2018).

The 4K4C+KCV Teaching Competency Development Model can be put into practice, which is consistent with previous studies. It was found that the model incorporates a competency-based approach that focuses on essential skills required in the automotive industry, ensuring that students acquire relevant knowledge and practical abilities (Pavlasek, 2020). Research indicates that this approach leads to improved student outcomes, as

it allows for tailored learning experiences that meet individual needs and industry standards (Sudarsono et al., 2021). In addition, the alignment of teaching materials with current teaching practices significantly influences student learning outcomes by ensuring that educational experiences are coherent and targeted toward achieving specific learning goals. This alignment fosters an environment where students can effectively engage with the material, leading to improved academic performance and skill acquisition. Constructive alignment (CA) is crucial in higher education, as it connects course objectives, teaching activities, and assessment methods to desired learning outcomes. The effective CA ensures that all elements of a course work together, enhancing the learning experience and promoting student success (Hristov et al., 2023; Yoon., Paul & Gruba, 2017). The important integrating technology and evidence-based instructional approaches can enhance teaching quality and student engagement. Continuous assessment and feedback mechanisms are vital for adapting teaching practices to meet student needs, thereby improving learning outcomes. Engaging students and faculty in reflective practices can lead to curriculum improvements and better learning outcomes, as demonstrated in management ethics courses. Collaborative teaching methods encourage active participation, which is linked to higher student satisfaction and performance (Harris & Bretag, 2003).

5. Conclusions

The overall quality of the teaching competency development model for teachers in the Bachelor of Technology Program in Automotive Technology at the Institute Vocational Education is at a high level. Therefore, the model should be used to develop teaching competencies for teachers in industrial subjects and vocational education institutions.

Acknowledgments

We would like to thank the teachers and the research team members who took part in this study.

Authors contributions

Dr. Witoon Huankhoksung were responsible for study design data, collection, and revising. Dr. Ophat Sukwan was revising. Asst. Prof. Dr. Chakrit Ponathong was revising. All authors read and approved the final manuscript.

Funding

Not applicable

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education. The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

Bambang, S., Budi, S., & Herminarto, S. (2021). Improving the competency of automotive vocational teachers with partnership-based training model (PBK). *Jurnal Teknologi Pendidikan, 22*(3), 200-208. https://doi.org/10.21009/JTP.V22I3.18690

Cornelis, van Dorp, Fons, Dehing, & Tim-Tomas, H. (2018). A competence development approach for flexible, autonomous and self-directed development of education in technology contexts. *Journal of Technology Education,* 65-75. https://doi.org/10.20472/TEC.2018.005.008

Gede, W., Kadek, R. D., Wiratmaja, I. G., Nyoman, A. W., Edi, E., & Edy, A. J. (2022). *An analysis of the teaching ability of dual expertise teachers in the automotive field to improve students' capabilities.* https://doi.org/10.4108/eai.27-11-2021.2315633

Howard, H., & Bretag, T. (2003). Reflective and collaborative teaching practice: Working towards quality student learning outcomes. *Quality in Higher Education, 9*(2), 179-185. https://doi.org/10.1080/13538320308151

Hristov, S., Nakov, D., & Miočinović, J. (2023). Constructive alignment between objectives, teaching and learning activities, student competencies and assessment methods in higher education. *Journal of Agriculture and Plant Sciences*. https://doi.org/10.46763/japs23212021h

Ministry of Education. (2008). *Vocational education act B.E. 2008*. Retrieved from https://www.lac.org.na/laws/annoSTAT/Vocational%20Education%20and%20Training%20Act%201%20of%202008.pdf

Ministry of Education. (2018). *National educational standards 2018.* Retrieved from http://www.sesa17.go.th/site/images/Publish2.pdf

Ministry of Higher Education, Science, Research and Innovation (MHESI). (2023). *Higher education, science, research and innovation strategic policy framework 2023-2027.*

Misbah, Z., Gulikers, J., Widhiarso, W., & Mulder, M. (2021). Exploring connections between teacher interpersonal behaviour, student motivation and competency level in competence-based learning environments. *Learning Environments Research,* 641-661. https://doi.org/10.1007/s10984-021-09395-6

Pavlasek, P. (2020). *Competency-based automotive/mobility engineering education: Implementation of creative project in modular model*. https://doi.org/10.1109/ELEKTRO49696.2020.9130344

Pliandist, P. (2023). *Model of vocation education management for bachelor program of technology with work integrated learning* (Doctoral dissertation, Graduate School, Naresuan University, Phitsanulok, Thailand). Photocopy.

Rudy, P., Wafirul, H., & Amilia, A. (2019). Effect of competence teacher and student learning environment program on student achievement light vehicle engineering. *KnE Social Sciences, 3*(12), 636-644. https://doi.org/10.18502/kss.v3i12.4135