International Journal of Learning, Teaching and Educational Research
Vol. 22, No. 12, pp. 42-61, December 2023
https://doi.org/10.26803/ijlter.22.12.3
Received Oct 19, 2023; Revised Dec 6, 2023; Accepted Dec 10, 2023

Using the Delphi Method to Explore Factors Affecting the Effectiveness of Pedagogical Competence Training on University Lecturers in Vietnam

Viet-Nga Thi Nguyen, Hanh-Phuong Thi Tran*, Ngoc-Anh Doan and Viet-Anh Thi Dao
Hanoi Pedagogical University 2, Vietnam
Hanoi Pedagogical University 2, Vietnam

Abstract. Pedagogical competence is one of the professional competencies of university lecturers. However, many universities have lecturers who are very competent in their subjects but do not have formal training in pedagogy. Therefore, it is necessary for lecturers teaching at the university level to participate in professional development courses on pedagogical competence. The purpose of this study was to explore the factors that affect the effectiveness of fostering pedagogical competence among university lecturers in Vietnam. The Delphi method was used to collect opinions from 40 educators. Research results showed that there are 29 factors affecting the effectiveness of fostering the pedagogical competence of university lecturers. Participants were classified into six main groups: factors that meet the training goals; factors on training content; factors on fostering methods; factors on media and training materials; factors on the form of training; and factors for evaluating training results. The results of this study will help policymakers and educational organisations devise institutions to improve the pedagogical competence of university lecturers. This is also the basis for universities to focus on investing in fostering pedagogical competence for lecturers and finding appropriate ways to provide regular, long-term, and continuous training.

Keywords: pedagogical competence; university; lecturers; Delphi Method

1. Introduction

In recent years, the development of science, engineering, technology, and information has strongly impacted all areas of social life, including education.

*Corresponding author: *Hanh-Phuong Thi Tran; tranthihanhphuong@hpu2.edu.vn*

The development of higher education has set quality requirements to ensure the training of high-quality human resources for society. Therefore, the pedagogical competence of lecturers in higher education institutions is hotly discussed in many aspects, including assessing pedagogical competence. (Zvarych, 2013), activities to improve professional competence (Biryuk, 2014), the influence and impact of pedagogical training on teaching methods and beliefs in self-efficacy (Postareff et. al., 2007).

The relevance and quality of university lecturers in pedagogical university training is an essential factor in intellectual and professional development for future teachers; it determines a nation's progress and everyone's opportunities (Saalman, 2018; Emilio, 2020). This is enshrined in the requirements of the Regulation on Appointment of Faculty and in the vision of Chalmers University of Technology. In the past, teaching was focused on providing and equipping learners with a large amount of knowledge, but today, teaching focuses on teaching how to learn, teaching search engines, discovering knowledge sources, and training skills job. In pedagogical schools, lecturers are the team that does this job well. There have been many research works mentioning and emphasising the role and professional skills of lecturers in universities (Luppertz et. Al., 2016; Winberg & Winberg, 2017; Tyurina et al., 2022). Thus, fostering and improving pedagogical competence is a condition for the development of lecturers' educational activities. This is the key factor and the necessary foundation to help universities carry out the educational innovation process.

Pedagogical competence is one of the professional competencies of lecturers (Ana, 2022). There have been quite a few studies on pedagogical competence, such as understanding the current situation, its causes, and providing solutions to improve, train, and enhance pedagogical competence (Veniger, 2016; Laato et. al., 2019; Tacconi et. al, 2022; Chadha, 2022). Researchers have also found many different ways to improve the pedagogical competence of lecturers at higher education institutions. The results show that the way they often do it is to organise refresher courses and training courses (Jensen, 2011; Ödalen et. al., 2019; Ritchey & Smith, 2019; Antikeyeva, 2021). In addition to direct learning, there are also online pedagogical courses, such as short-term online courses on teacher interpretation through teaching situations (Vilppu et al., 2019); identifying priority activities and ways to develop the professional competence of university teachers (Reznik & Vidovina, 2018); and building a flexible pedagogical certificate programe (Ezechil & Coman , 2012; Bulmann et. al., 2020).

The Delphi method is a qualitative and systematic forecasting method that involves collecting opinions from a group of experts through several rounds of questions used in the study. The Delphi method relies on experts who are knowledgeable about a given topic so that they can forecast the outcomes of future situations, predict the likelihood of an event occurring, or reach consensus on a topic specifically.

Although there have been studies on pedagogical competence from many different aspects, one aspect that has not been clearly researched is the analysis of factors affecting the effectiveness of pedagogical training for university lecturers. Therefore, this study focuses on finding out the factors affecting the effectiveness of pedagogical competence building for university lecturers in Vietnam. The results of the study will help educators and policymakers define pedagogical competence and take action to improve pedagogical competence for university lecturers.

The study was conducted to address the following questions:
1. According to the opinions of educational experts, are there any groups of factors that affect the effectiveness of fostering pedagogical capacity for university lecturers in Vietnam?

2. Level of consensus among experts on factors affecting the effectiveness of pedagogical capacity training for university lecturers in Vietnam. From there, initially estimate the importance of these factors.

2. Literature Review

2.1. Pedagogical competence of university lecturers

The teacher's pedagogical competence is the ability to successfully carry out teaching activities at school based on the mobilisation and application of a system of professional knowledge, professional skills, and attributes of other individuals directly involved in the instructional activities to be performed (Duc M.B. et al., 2017). Many scientific studies have been conducted to explore issues related to the pedagogical competence of university teachers. The role of lecturers ranges from imparting knowledge to facilitating students' learning processes (Akhmetova, 2019; Yürekli Kaynardağ & Aynur, 2019).

2.2. Training pedagogical competence for university lecturers

In the context of educational innovation, lecturers must acquire new skills and competencies to guarantee that students receive high-quality instruction. Therefore, lecturers need to foster, train, and practice their profession to improve their professional competence. Training the pedagogical competence of university lecturers can take many different forms. The research focuses on solutions to ensure the quality of training specialists in the field of higher education: identify the priority activities of university teachers and propose ways to develop their expertise because this is considered the most important task of universities, methods to develop teachers' professional qualities and competencies (Reznik. and Vdovina, 2018; Silva et. al., 2018). Pedagogical training courses for university lecturers are determined to be very important and bring about the expected effects for the participants (Ödalen, 2019). In addition to face-to-face courses, the organisation of online courses is also being applied to solve the problem of many lecturers who are teaching at universities without pedagogical training (Laato et. al., 2019).

Forms of pedagogical competence training for university lecturers can be organised with many contents: a three-semester training course for university teaching assistants (Ritchey and Smith, 2019); reforming the education system,

focusing on innovating lecturers' teaching methods by shifting from imparting knowledge to creating a favourable environment so that students can study and practice (Akhmetova, 2019). Focus on preparing for the teaching process by exploring and establishing personal academic development methods (Chadha, 2022). Or you can create a guidebook for teachers to start the training process. Over the course of a term, this notebook asks increasingly complex questions related to topics covered in teacher training. Testing the manual on a new group of teaching assistants achieved positive feedback and provided valuable input in discussions (Pekkarinen & Hirsto, 2017). Thus, lecturers play an important role in ensuring the quality of education at universities. Therefore, finding factors that affect the training of the pedagogical competence of university lecturers helps educators and policymakers propose activities to improve the professional competence of university lecturers.

3. Methodology

The Delphi method was first developed by the RAND Corporation in the 1960s to explore ideas and find consensus among a group of experts (Linstone & Turoff, 1975; Gordon, 2003;). Today, this method is widely used in many different fields, such as nursing research (Keeney et.al., 2006; marketing (Bonnemaizon et. al., 2007); tourism (Chen et. al., 2017); urbanism (Perveen et. al., 2017); and education (Popov et. al., 2019). Given the exploratory nature of this study, using the Delphi method is an appropriate way to address the research objectives. According to Keeney et.al., (2001), the Delphi method uses an iterative process to reach consensus among different experts on a given problem. Since pedagogical competence is one of the important factors determining the success of the teaching process in the context of research and higher education in Vietnam, consensus is needed among scholars with experience in the field of education science.

3.1. Research Instrument and Data Collection

The Delphi method usually begins with an interview to solicit opinions from experts on the given problem. Based on the results of the interview round (round 1), combined with document searches, the researcher designed a questionnaire for round 2. In the second round, experts were asked to complete the questionnaire. Using a numerical rating scale, they were also asked to provide explanations for their answers and suggest modifications to the questionnaire if necessary. The answers and feedback from the experts from the first round were used as input to further refine the question set in subsequent rounds. The iterative process of questionnaire development ends when a predetermined level of agreement among experts is achieved (Irvine, 2005).

Therefore, the number of survey rounds could be 2, 3, or more, or even just 1. In the Delphi process, data analysis can involve both qualitative and quantitative data. Researchers must process qualitative data, using open-ended questions to engage experts in the first round of discussion. Subsequent discussion rounds can collect responses for quantitative analysis to redefine the content and reach a level of consensus among panelists. According to Keeney et al., (2006), an item is defined as achieving consensus among Delphi study participants when at least

75% of respondents scored either strongly agree (i.e., 5 on a 5-point Likert scale) or agree (i.e., 4 on a 5-point Likert scale). Delphi discussion rounds exploit the experience and knowledge of experts, mobilising their thinking and judgement towards answering research questions, exploring new topics, and generalising findings and information systems that did not exist before.

The data from the experts' answer sheets was put together and looked at with descriptive statistics to see how much the experts agreed with each composite variable on a 5-point Likert scale and proposed specific measurement variables, to compare opinions between groups of experts according to some classification criteria. At the same time, the Coefficient of Variation (CV) is used to measure the level of expert disagreement, from which there can be a solution to handle the expert disagreement (if any). The research process is shown in Figure 1.

3.2. Participants

Choosing the right expert is the most important step in the entire process of implementing the Delphi method for data collection because the quality of experts affects the quality of opinions participating in discussions and contributions (Mahajan et. al., 1976; Okoli & Pawlowski, 2004). This study selected educational science researchers and lecturers with over 15 years of teaching experience at universities. We invited 40 people who met the above criteria, including 7 people who do research in educational science and 33 people who are lecturers at universities Vietnam. These people come from Hanoi National University, Ho Chi Minh City University of Education, Hanoi Pedagogical University 2, Vinh University, Hue University of Education, The University of Danang - University of Science and Education. These are all pedagogical universities in Vietnam. All 40 participants in this study had personal contact with the co-authors of this study. According to McKenna (1994), because high response rates in successive rounds of the Delphi survey are so important, personal contacts with the study's investigators are crucial. Ultimately, all 40 individuals agreed to participate in round 1 of the study (100% acceptance rate). The number of experts participating in the discussion according to the Delphi method also does not require a mandatory number of experts, which can range from a few experts to several hundred experts (Habibi et al., 2013). Therefore, our number of participants was satisfactory.

Research organisation

This study included three rounds to identify factors that affect the effectiveness of fostering pedagogical capacity for university lecturers (see Figure 1). According to Keeney et al., (2006), an item is defined as reaching consensus 2 among Delphi study participants when at least 75% of respondents score strongly agree (i.e., 5 on a 5-point Likert scale) or agree (i.e., 4 on a 5-point Likert scale).

Round 1: The goal of round 1 of Delphi is to identify a set of factors that could affect the effectiveness of fostering lecturers' pedagogical capacity. An online discussion was conducted through the online interface of Google Meet. There were 10 experts participating in the online discussion. The discussion took place within 3 hours. After discussing and answering research questions, the group of

experts reached consensus on the factors affecting the effectiveness of fostering pedagogical capacity among university members.

Round 2: The goal of round 2 is to encourage consensus among experts about the factors that need to be explored. From the results of the discussion in round 1, synthesising the opinions of experts and document research, the author outlined a system of factors with related variables affecting the effectiveness of capacity training pedagogy of university lecturers to develop questionnaires. The questionnaire included a system of questions selected on a 5-level Likert scale from Not important; So important; Confused; Important; Very important. We conducted the survey online due to its advantage in reducing time requirements. Since all of our participants are highly qualified professionals, it were assumed that they are familiar with using online surveys. Due to its simple administration features and ease of access, Google Forms were chosen as an online survey tool. The questionnaire was sent to 40 experts via Google Form with the request to complete the answers within 5 working days. The researcher received 40 answer sheets.

Round 3: The objective was to provide depth and detail to the factors affecting the pedagogical capacity building of university lecturers. The results of the 2nd round discussion are the input for the 3rd round discussion. Participants are asked to rate their agreement included a on variables related to factors affecting the effectiveness of pedagogical capacity building for university teachers. The questionnaire system of questions selected on a 5-level Likert scale from Strongly disagree; Disagree; Still wondering; Agree; Totally agree. The researcher sent out 40 experts and received 40 answer sheets.

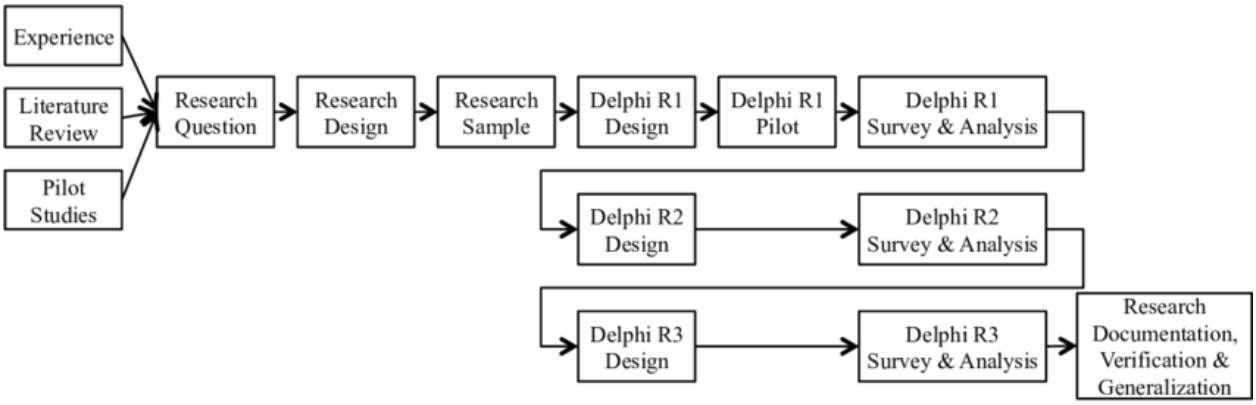

Figure 1: Delphi Research Process (Source: Skulmoski et.al., 2007)

4. Findings

4.1. Round 1

In the first round, we organized an online discussion via Google Meet with 10 experts. The questionnaire included six discussion questions to explore issues related to the effectiveness of pedagogical training for university lecturers today. Experts discussed and agreed with the following general statements:

The first, training goals that university lecturers desired included issues related to education in general and higher education in particular; issues related to the psychology of students participating in the learning process; issues related to teachers' professional skills in the new context; and issues related to scientific research in the university.

The second, content that needs to be trained for university lecturers involved basic knowledge of teaching, basic skills of the teaching profession, scientific research capacity, capacity to plan and organize teaching, ability to assess learners' learning outcomes, classroom management capacity.

The third, methods and measures for organizing pedagogical training for lecturers needed to be flexible, diverse, increase positivity, and be suitable to learners' characteristics. Reporters in refresher courses the same to take timely measures to support trainees during the training process.

The fourth, facilities and learning materials for pedagogical training for lecturers need to be provided promptly, fully, and in accordance with the objectives, content, and form of training.

Then, the form of training organization could be face-to-face, online, or a combination of online and face-to-face. Besides, it is possible to use a training model through research and discovery, a training model through experience, or a training model that combines theory and practice.

Finally, Organizing the assessment of pedagogical training activities could diversify forms, methods, and assessment tools. Paying attention to the development of vocational competence in learners. An assessment record can be developed to track refresher activities.

4.2. Round 2

In round 2, we sent an online survey to 40 people who agreed to participate in the Delphi study. There were three parts to the questionnaire. The first part examined the personal characteristics of the participants (see Table 1). The second part of the survey included 34 five-point Likert scale items related to six factors affecting the effectiveness of fostering pedagogical competencies for lecturers (see Table 2). In the third part, the research team asked two open questions. The first question asked whether the terms in the 34 items in Part 2 need revision or adjustment. The second question asked respondents to suggest new items, in addition to the original 34 items, that could affect the effectiveness of cultivating lecturers' pedagogical competencies.

Table 1: Study Variables

Characteristics of Participants		**Round 2**	
		Frequency	%
Gender	Male	25	62.50%
	Female	15	37.50%

Number of years of work	Less than 5 years	0	0.00%
	From 5 to 10 years	17	42.50%
	Over 10 years	23	57.50%
Degree	PhD	6	15.00%
	M Master's Degree	34	85.00%
Workplace	Research agency	7	17.50%
	University	33	82.50%

Table 1 presents the personal characteristics of 40 survey participants. Thes characteristics constitute the study variables. Specifically, out of these 40 participants, 25 (or 62.5%) were men and 15 (or 37.5%) were female. Most of the participants have worked for more than 5 years, thus having enough experience in teaching and assessing the factors affecting the effectiveness of pedagogical was especially capacity building for teachers. In terms of qualifications, 34 people (or 85.0%) had a doctorate, while 6 people (or 15%) had a master's degree. As such, they were all qualified to teach at the university level. All participants joined to work at an institution related to higher education, such as a university or research laboratory in educational sciences. This important because, as required by the Delphi method, participants had to be experts or experienced in the research area.

Table 2: Results of the Delphi Round 2 and Round 3 of group of factors needed to meet the training objective

No.	Symbol	Item	Round 2 (n = 40)			Item	Round 3 (n = 40)		
			Mean	SD	% of Consensus		Mean	SD	% of Consensus
1	MT 1	Basic knowledge about the Vietnamese education system in general and university education in particular	3.5	0.78	32.50%				
2	MT 2	Vocational skills in a new context	4.8	0.46	97.50%	Vocational skills in a new context	4.75	0.49	97.50 %
3	MT 3	Ability to flexibly use teaching methods in organizing professional activities	4.85	0.43	97.50%	Ability to flexibly use teaching methods in organizing professional activities	4.875	0.40	97.50 %
4	MT 4	Ability to use teaching aids	4.825	0.45	97.50%	Ability to use teaching aids	4.85	0.43	97.50 %

		in organizing professional activities				in organizing professional activities			
5	MT 5	Ability to develop professional expertise to improve professional competence	3.4	0.74	25.00%				
6	MT 6	Ability to apply information technology and advances in science and technology into professional activities	4.85	0.43	97.50%	Ability to apply information technology and advances in science and technology into professional activities	4.9	0.30	100.00 %
7	MT 7	Competence to perform scientific research tasks in the major	4.05	0.32	97.50%	Competence to perform pedagogical research tasks	4.225	0.48	97.50 %
8	MT 8	Ability to use foreign languages in carrying out professional activities	4.075	0.42	95.00%	Ability to use foreign languages in carrying out professional activities	4.125	0.46	95.00 %
9	MT 9	Ability to analyze, evaluate the current situation, and improve the practice of Vietnamese higher education	3.35	0.70	22.50%				
10	MT 10	Ability to self-study and self-train to improve professional competence	3.95	0.32	92.50%	Ability to self-study and self-train to improve professional competence	4.05	0.32	97.50 %
11	MT 11	Actively update achievements and development trends in higher education around the	4.2	0.41	100.00 %	Actively update achievements and development trends in higher education.	4.375	0.49	100.00 %

		world and in Vietnam.							
12	MT 12	Ready to support and help colleagues and learners in professional activities.	4.125	0.52	92.50%	Ready to support and help colleagues and learners in professional activities.	4.225	0.53	95.00 %
13	MT 13	Proactive, positive, confident in professional activities	4.05	0.32	97.50%	Proactive, positive, confident in professional activities	4.2	0.46	97.50 %

Table 3: Results of the Delphi Round 2 and Round 3 of group of elements on training content

No.	Symbol	Item	Round 2 (n = 40)			Item	Round 3 (n = 40)		
			Mean	SD	% of Consensus		Mean	SD	% of Consensus
1	ND 1	Basic knowledge of pedagogical profession	4.075	0.27	100.00%	Basic knowledge of pedagogical profession	4.225	0.42	100.00 %
2	ND 2	Basic skills in teaching profession	4.9	0.30	100.00%	Basic skills in teaching profession	4.9	0.30	100.00 %
3	ND 3	Pedagogical scientific research competence	4.875	0.33	100.00%	Pedagogical scientific research competence	4.9	0.30	100.00 %
4	ND 4	Competence to develop teaching plans	4.8	0.46	97.50%	Competence to develop teaching plans	4.85	0.36	100.00 %
5	ND 5	Competence to organize teaching activities	4.9	0.30	100.00%	Competence to organize teaching activities	4.925	0.27	100.00 %
6	ND 6	Competence to evaluate learners' learning outcomes	4.85	0.43	97.50%	Competence to evaluate learners' learning outcomes	4.825	0.45	97.50 %
7	ND 7	Classroom management competence	4	0.39	92.50%	Classroom management competence	4.225	0.53	95.00 %

Table 4: Results of the Delphi Round 2 and Round 3 of group of factors on fostering methods

No.	Symbol	Item	Round 2 (n = 40)			Item	Round 3 (n = 40)		
			Mean	SD	% of Consensus		Mean	SD	% of Consensus
1	PP 1	Flexible and diverse use of pedagogical training methods	4.925	0.27	100.00%	Flexible and diverse use of pedagogical training methods	4.9	0.30	100.00 %
2	PP 2	Methods of training promote the positive, active learning of learners	4.8	0.41	100.00%	Methods of training promote the positive, active learning of learners	4.85	0.36	100.00 %
3	PP 3	Training methods are suitable for learners' characteristics	4.875	0.33	100.00%	Training methods are suitable for learners' characteristics	4.85	0.36	100.00 %

Table 5: Results of the Delphi Round 2 and Round 3 of factors on means and training materials

No.	Symbol	Item	Round 2 (n = 40)			Item	Round 3 (n = 40)		
			Mean	SD	% of Consensus		Mean	SD	% of Consensus
1	PT 1	Means and equipment of teaching and learning materials suitable to forms of training.	4.9	0.38	97.50%	Means and equipment of teaching and learning materials suitable to forms of training.	4.875	0.40	97.50 %
2	PT 2	Training materials are provided fully and in a timely manner	4.85	0.43	97.50%	Training materials are provided fully and in a timely manner	4.9	0.38	97.50 %
3	PT 3	Training materials are consistent with training goals and content	4.85	0.43	97.50%	Training materials are consistent with training goals and content	4.85	0.43	97.50 %

Table 6: Results of the Delphi Round 2 and Round 3 of group of factors on the form of training

No.	Symbol	Item	Round 2 (n = 40)			Item	Round 3 (n = 40)		
			Mean	SD	% of Consensus		Mean	SD	% of Consensus
1	HT 1	Model of combined online and face-to-face training	4.975	0.16	100.00%	Model of combined online and face-to-face training	4.925	0.27	100.00 %
2	HT 2	Face-to-face training model	4.325	0.69	87.50%	Face-to-face training model	4.55	0.55	97.50 %
3	HT 3	Online training model	3.25	0.59	17.50%				
4	HT 4	Model of training through experience	4.075	0.27	100.00%	Model of training through experience	4.175	0.38	100.00 %
5	HT 5	The Training model combines theory and practice	4.925	0.27	100.00%	The Training model combines theory and practice	4.95	0.22	100.00 %

Table 7: Results of the Delphi Round 2 and Round 3 of group of factors for evaluating training results

No.	Symbol	Item	Round 2 (n = 40)			Item	Round 3 (n = 40)		
			Mean	SD	% of Consensus		Mean	SD	% of Consensus
1	ĐG 1	Diversify assessment forms	4.9	0.30	100.00%	Diversify assessment forms	4.9	0.30	100.00 %
2	ĐG 2	Assessment focuses on developing learners' vocational competence	4.85	0.43	97.50%	Assessment focuses on developing learners' vocational competence	4.875	0.40	97.50 %
3	ĐG3	Develop evaluation records to monitor training activities	3.775	0.80	55.00%				

The main results of Round 2 were presented in from Table 2 to Table 7. Along with the mean and standard deviation associated with each item, from Table 2 to Table 7 also presents the percentage of consensus, which was an integral part of

using the Delphi technique. As shown in Table out of 34 items, 29 reached a consensus level above 75%. The contents that did not achieve consensus is "basic knowledge about the Vietnamese education system in general and university education in particular", "ability to develop professional expertise to improve professional competence", "ability to analyze, evaluate the current situation, and improve the practice of Vietnamese higher education", "online training model," and "develop evaluation records to monitor training activities" (sections MT1, MT5, MT9, HT3, DG3). Sections MT7 and MT11 have received proposed terminology adjustments.

4.3. Round 3

In Round 3, the questionnaire included 29 items based on Round 2. The study further invited all 40 participants who participated in Round 2 to continue participating in Round 3. Since all respondents were positive about the research, they all accepted the invitation to participate in Round 3. The results of Round 3 are presented in Table 2. The results of Round 3 showed that all 29 items achieved a consensus of 95% or more.

5. Discussion

The pedagogical competence of university lecturers has received increasing attention in the field of higher education in Vietnam in recent years (Peeraer & Van Petegem, 2010; Tran, 2016; Thao et. al., 2022). This is the result of the higher education innovation process being implemented by the Vietnamese government and universities (Vietnam National Assembly, 2013). Traditionally, in Vietnam, universities mainly focus on teaching knowledge by the presentation method so that students can remember the specialized knowledge they study. Today, they are very aware of the importance of teaching to develop students' career capabilities. To do this, universities need to focus on developing the professional and pedagogical competence of their lecturers. To find out the factors that affect the improvement of lecturers' pedagogical competence when participating in professional development training courses, this study used the Delphi method to achieve consensus among experts on the issue. This hrough three rounds of surveying, we found 29 factors that might lead to improving pedagogical competence for university lecturers. The names of these elements all reflect their respective properties. We grouped elements that share common attributes together and classifled them into six element groups:

The group of factors needed to meet the training objective includes 10 elements: Vocational skills in the new context; ability to flexibly use teaching methods in organizing professional activities; ability to use teaching aids in organizing professional activities; ability to apply IT, advances in science and technology, and technology into professional activities; ability to perform pedagogical scientific research tasks; ability to use foreign languages in performing professional activities; ability to self-study and self-train to improve professional capacity; actively update achievements and development trends in higher education; willingness to support and help colleagues and learners in professional activities; proactive, positive, and confident in professional activities

Group of elements on training content: included elements: Basic knowledge of pedagogical skills; Basic skills of the teaching profession; Pedagogical scientific research competence; Competence to develop teaching plans; Competence to organize teaching activities; Competence to assess learners' learning results; Classroom management competence. Group of factors on fostering methods, including three elements: Flexible and diverse use of pedagogical training methods; Methods of training promote the positive, active learning of learners; Training methods are suitable for learners' characteristics. Group of factors on means and training materials, included 3 elements: teaching means, equipment, and learning materials suitable for forms of training; training materials were provided in full and in a timely manner; training materials are consistent with training goals and content. Group of factors on the form of training: included 4 factors: Training model combining online and face-to-face; Face-to-face training model; Model of training through experience; The training model combines theory and practice. Group of factors for evaluating training results: includes 2 factors: Diversifying assessment forms; Assessment focuses on developing learners' vocational competence.

5.1. Factors related to meeting training goals

An important factor that contributes to the design of courses in higher education environments is clearly defined learning objectives that are aligned with learning activities and course assessments (Barthakur et.al., 2022). Determining the goals of a course or curriculum and then focusing the educational process on those goals facilitates management and improves the quality of the course. Therefore, the experts in our sample emphasized the role of factors related to meeting goals in the effectiveness of training pedagogical competence for university lecturers. The training course set out the goals as follows "ability to apply information technology, apply advances in science and technology into professional activities," and "actively update achievements and development trends of higher education," which achieved the highest consensus of the respondents with a rate of 100%. This emphasizes the necessity of using up-to-date educational trends, information technology, and other scientific and technological applications in teaching. The remaining elements of the group that met the training goals all had a consensus rate of over 95%, which showsed that pedagogical competence training courses needed to meet the requirements related to the subjects of the program teaching process, such as teaching media, teaching methods, pedagogical research, and the qualities of the teacher.

Elements such as "basic knowledge of the Vietnamese education system in general and higher education in particular"; "ability to develop professional expertise to improve professional competence"; "the ability to analyze, evaluate, and improve the practice of higher education in Vietnam" could not reach consensus, which was understandable. Because updating achievements and trends in world development will provide a more general overview to help researchers and policymakers find ways to implement education in Vietnam. And that will also help improve the professional competence of teachers.

5.2. Factors related to training content

When choosing to participate in a training course, most learners will learn about the content of that course. Vlasenko (et. al., 2020) point out the content that helps learners find out their level of awareness about using the teaching method of interest. Guldana (2019) pointed out the need in the content of pedagogical competence building for teachers: often effective methods of teaching, designing, and evaluating educational programs; evaluating student learning outcomes; meeting the diverse needs of students in the classroom; using information technology in the learning process; and providing content on topics and subjects. These contents are also completely consistent with the training contents that the research results have found. The content on teaching methods, providing content on topics and subjects, was also the way to build teaching plans and organize teaching activities. The content of meeting the diverse needs of students in the class was also part of the competence of the lecturer's classroom management. The use of information technology in the teaching/learning process is one of the basic skills of the teaching profession. Thus, the research findings presented were content factors that affect the effectiveness of training. Particularly, the elements of basic knowledge about the pedagogical profession and research competence were the factors proposed by this research because they were the factors promoting the process of self-study and self-improvement of lecturers. teacher at the university level.

5.3. Factors related to forms, methods, means and training materials

The factors of training methods, training forms, training facilities, and learning materials directly impact whether learners actively participate in the learning process or not. Although many studies have shown that teaching models combining face-to-face and online are quite effective in the current period. But Ashraf, (2021) stated: "Blended learning was used for 19 in-service teachers during their summer degree program at a Chinese university." (Jain & Singh, (2021) also pointed out that "Ed-Tech solutions are not relevant for hard-to-reach students or teachers in schools that serve hard-to-reach communities".

However, Laato et al., *(2019)* stated, "Employee training courses on pedagogy are offered via contact teaching, thus excluding potential students who are too busy to attend sessions at a specific time and place" and this system of course seems to be a promising way to support the pedagogical training of teachers. Thus, our research results partly confirm that the appropriate form of training to improve the effectiveness of training pedagogical competence for teachers is the direct training model. In the case of overcoming geographical distance or busyness at work, a model of face-to-face training combined with online learning can be used. We also affirm that experiential training models and training models combining theory and practice will create conditions for flexible and diverse use of training methods. At the same time, these are teaching forms that help teachers use teaching methods to promote the activeness of learners.

When using any form or method of training, the teaching media and learning materials must be appropriate and timely. These are the factors that help teachers fulfil their teaching role well, and learners are convenient in completing teaching tasks. Therefore, these factors achieved a very high consensus among experts participating in the survey. The factor that the "online training model"

not reach consensus is understandable. Because both previous studies and experts who participated in our survey said that it is not advisable to train pedagogical competence for university lecturers through the online form at all. In order to improve pedagogical competence, it is necessary for learners to practice in mock classes or real classes. This is not effective when learners participate entirely online

5.4. Factors related to assessment training results

Evaluating the training results of learners is a final stage of the educational process. However, in current practice, this is a factor that directly affects the form and method of teaching. O'Neill (2022) stated, "Educators reported that many students succeeded with unfamiliar assessments." Therefore, the results of our research on the factor "diversification of assessment forms" that affects the effectiveness of training pedagogical competence for teachers are consistent with previous studies. In addition, the organization of training is aimed at developing the pedagogical competence of university lecturers, so the process of evaluating the training results must be a competence assessment with the goal of creating opportunities for competence development.

The factor "building a record of assessment and monitoring of training activities" did not reach consensus. The reason was that refresher courses to improve the competence of teachers often take place in a short time with a large number of learners. Therefore, it is difficult to use assessment records to track refresher activities.

6. Conclusions

Pedagogical competence is one of the core competencies of university teachers and lecturers. Presently, new standards have been imposed on the teaching profession, centred on pedagogical ability to manage, run, and arrange productive classrooms, due to the growth of society and the vast body of information. However, the majority of university lecturers in Vietnam often do not receive formal training in pedagogical skills but rather learn them through personal self-study. Therefore, it is necessary to organize training to improve pedagogical competence for university teachers. How to organize such courses effectively is a question many researchers and policymakers in Vietnam ponder. Faced with that situation, the purpose of this study was to investigate the main factors that make up the effectiveness of fostering pedagogical competence for teachers. This study identified 29 elements influencing the efficacy of university lecturers' efforts to develop their pedagogical competence through the use of the Delphi technique to gather comments from 40 experts. These 29 elements are divided into six categories: group of variables that satisfy training objectives; group of variables regarding training content; group of variables regarding training techniques; group of variables regarding facilities and training resources; group of variables regarding the nature of training; group of variables for assessing training outcomes.

The results of this study provide information for a range of stakeholders. Specifically, they can serve as a basis for higher education researchers in the

direction of faculty competence development research. In addition, they can be the basis for policymakers and educational institutions to put forward institutions to improve the pedagogical competence of university lecturers. First, researchers in higher education should have research directions on the pedagogical knowledge and skills required of each lecturer, thereby offering training programs and contents on pedagogical competence for university lecturers. Second, the Vietnamese government and universities should invest more deeply in training for university lecturers, find ways for them to provide regular, long-term, and continuous training. For example, allowing teaching staff to access knowledge about pedagogical science through electronic resources or needing instructions for teachers to practice their own pedagogical competence. Every year, there should be a period of time for teachers to directly participate in courses or experience new pedagogical knowledge and skills.

Although the Delphi method helps to explore the factors affecting the effectiveness of university lecturers' pedagogical competence building, it cannot estimate the relative importance of these factors. In this direction, further studies can apply methods other than the Analytical Hierarchy Process (AHP) or Structural Equation Modelling (SEM) to quantify the relative weights of different factors, with status being a factor that affects the effectiveness of training the pedagogical competence of university lecturers.

7. Acknowledgment

This study is financially supported by the Vietnam Ministry of Education and Training under project B.2023-SP2-04.

8. References

Akhmetova, G., Hendrixson, V., Nuralieva, U. (2019). Faculty Development Framework: Experience of Kazakhstani Medical Schools. *Universal Journal of Educational Research*, 7(11), 2278-2286. http://doi.org/10.13189/ujer.2019.071105

Ana, A. (2022). Defining Vocational Teacher Competencies in Industry 4.0 from the Perspective of Teachers and Lecturers. *Journal of Engineering Education Transformations*, 35(2), 39–46. https://journaleet.in/articles/defining-vocational-teacher-competencies-in-industry-40-from-the-perspective-of-teachers-and-lecturers

Antikeyeva, S., Snapkova, A., Xembayeva, S., Aubakirova, R. Z., & Sultanova, N. (2021). Formation of Psychological and Pedagogical Competencies of Social Workers through Professional Development Courses. *Cypriot Journal of Educational Sciences*, *16*(4), 1858-1877. https://orcid.org/0000-0003-4604-5661

Ashraf, M. A., Tsegay, S. M., & Meijia, Y. (2021). Blended Learning for Diverse Classrooms: Qualitative Experimental Study With In-Service Teachers. *SAGE Open*, *11*(3). https://doi.org/10.1177/21582440211030623

Barthakur, A., Joksimovic, S., Kovanovic, V., Richey, M., & Pardo, A. (2022). Aligning objectives with assessment in online courses: Integrating learning analytics and measurement theory. *Computers & Education*, *190*, 104603. https://doi.org/10.1016/j.compedu.2022.104603

Biryuk, L. A. (2014). Research activity as means of teacher's professional and expert growth. *Life Science Journal*, *11*(SPEC. ISSUE 8), 62-65. http://www.lifesciencesite.com/lsj/life1108s/011_24767life1108s14_62_65.pdf

Bonnemaizon, A., Cova, B., & Louyot, M. C. (2007). Relationship marketing in 2015:: a Delphi approach. *European Management Journal*, *25*(1), 50-59. https://doi.org/10.1016/j.emj.2006.12.002

Bulmann, U., Billerbeck, K., & Bornhöft, S. (2020). Creating a flexible pedagogical qualification program at a German university of technology. In *48th SEFI Annual Conference 2020* (pp. 1233-1238). SEFI. https://tore.tuhh.de/entities/publication/9107763b-5091-428b-b38b-7c16632d3804/publicationdetails

Chadha, D. (2022). How do we prepare to teach? Exploring science lecturers' authentic approaches to teaching in higher education. *Research in Science Education*, *52*(2), 635-653. https://doi.org/10.1007/s11165-020-09972-4.

Chen, L., Ng, E., Huang, S. C., & Fang, W. T. (2017). A self-evaluation system of quality planning for tourist attractions in Taiwan: An integrated AHP-Delphi approach from career professionals. *Sustainability*, *9*(10), 1751. https://doi.org/10.3390/su9101751

Duc Bui Minh et al (2017). Developing professional competence for pedagogical students. *Vietnam Education Publishing House*, p. 16.

Emilio, R. P. (2020). Relevancia del profesorado universitario en la formación pedagógica/ Relevance of university teaching staff in pedagogical training. *Revista De Ciencias Sociales*, *26*(4), 419-432. https://doi.org/10.31876/rcs.v26i4.34671

Ezechil, L., & Coman, P. (2012). Analysis of didacticians' psycho-pedagogical competences. *Procedia-Social and Behavioral Sciences*, *33*, 233-237. https://doi.org/10.1016/j.sbspro.2012.01.118

Guldana, A., Hendrixson, V., Nuralieva, U., (2019). Faculty Development Framework: Experience of Kazakhstani Medical Schools. *Universal Journal of Educational Research*, 7(11), 2278 - 2286. http://doi.org/10.13189/ujer.2019.071105

Habibi, A., Sarafrazi, A., & Izadyar, S. (2013). Delphi technique theoretical framework in qualitative research. *International Journal of Engineering Science*, *3*(4), 8–13. https://www.researchgate.net/publication/272177606_Delphi_Technique_Theoretical_Framework_in_Qualitative

Irvine, F. (2005). Exploring district nursing competencies in health promotion: the use of the Delphi technique. *Journal of clinical nursing*, *14*(8), 965-975. https://doi.org/10.1111/j.1365-2702.2005.01193.x

Jain, S., Lall, M., & Singh, A. (2021). Teachers' Voices on the Impact of COVID-19 on School Education: Are Ed-Tech Companies Really the Panacea? *Contemporary Education Dialogue*, *18*(1), 58–89. https://doi.org/10.1177/0973184920976433

Jensen, J. L. (2011). Higher Education Faculty versus High School Teacher: Does Pedagogical Preparation Make a Difference?. *Bioscene: Journal of College Biology Teaching*, *37*(2), 30-36. https://files.eric.ed.gov/fulltext/EJ972012.pdf

Keeney, S., Hasson, F., & McKenna, H. (2006). Consulting the oracle: ten lessons from using the Delphi technique in nursing research. *Journal of advanced nursing*, *53*(2), 205-212. https://doi.org/10.1016/S0020-7489(00)00044-4

Laato, S., Salmento, H., Heinonen, N., Lipponen, E., Vilppu, H., Virtanen, H., & Murtonen, M. (2019). Solving diversity issues in university staff training with UNIPS pedagogical online courses. In *2019 IEEE Learning With MOOCS (LWMOOCS)* (pp. 138-144). IEEE.

https://doi.org/10.1109/LWMOOCS47620.2019.8939634

Linstone, H. A., & Turoff, M. (Eds.). (1975). *The delphi method* (pp. 3-12). Reading, MA: Addison-Wesley.

Luppertz, C., Himmel, Ouehrani, N., & Winzker, M. (2016). Sharpening the educational toolset—Promoting professional development of university lecturers. In *2016 IEEE Global Engineering Education Conference (EDUCON)* (pp. 100-104). IEEE. https://doi.org/10.1109/EDUCON.2016.7474538

Mahajan, V., Linstone, H. A., & Turoff, M. (1976). The Delphi Method: Techniques and Applications. *Journal of Marketing Research*, *13*(3), 317. https://doi.org/10.2307/3150755

McKenna, H. P. (1994). The Delphi technique: a worthwhile research approach for nursing?. *Journal of advanced nursing*, *19*(6), 1221-1225. https://doi.org/10.1111/j.1365-2648.1994.tb01207.x

Ödalen, J., Brommesson, D., Erlingsson, G. Ó., Schaffer, J. K., & Fogelgren, M. (2019). Teaching University Teachers to Become Better Teachers: The Effects of Pedagogical Training Courses at Six Swedish Universities. *Higher Education Research & Development*, *38*(2), 339-353. https://doi.org/10.1080/07294360.2018.1512955

O'Neill, G., & Padden, L. (2022). Diversifying assessment methods: Barriers, benefits and enablers. *Innovations in education and teaching international*, *59*(4), 398-409. https://doi.org/10.1080/14703297.2021.1880462

Okoli, C., & Pawlowski, S. D. (2004). The Delphi method as a research tool: an example, design considerations and applications. *Information & Management*, *42*(1), 15–29. https://doi.org/10.1016/j.im.2003.11.002

Peeraer, J. & Van Petegem, P. (2010). Factors Influencing Integration of ICT in Higher Education in Vietnam. In Z. Abas, I. Jung & J. Luca (Eds.), *Proceedings of Global Learn Asia Pacific 2010--Global Conference on Learning and Technology* (pp. 916-924). Penang, Malaysia: Association for the Advancement of Computing in Education (AACE). Retrieved September 9, 2023 from https://www.learntechlib.org/primary/p/34284/

Pekkarinen, V., & Hirsto, L. (2017). University Lecturers' Experiences of and Reflections on the Development of Their Pedagogical Competence. *Scandinavian Journal of Educational Research*, *61*(6), 735-753. https://doi.org/10.1080/00313831.2016.1188148

Perveen, S., Kamruzzaman, M., & Yigitcanlar, T. (2017). Developing Policy Scenarios for Sustainable Urban Growth Management: A Delphi Approach. *Sustainability*, *9*(10), 1787. https://doi.org/10.3390/su9101787

Popov, V., Jiang, Y., & So, H. J. (2020). Shared lessons in mobile learning among K-12 education, higher education and industry: an international Delphi study. *Educational Technology Research and Development*, *68*, 1149-1180. https://doi.org/10.1007/s11423-019-09731-x

Postareff, L., Lindblom-Ylänne, S., & Nevgi, A. (2007). The Effect of Pedagogical Training on Teaching in Higher Education. *Teaching and teacher education*, *23*(5), 557-571. https://doi.org/10.1016/j.tate.2006.11.013

Reznik, S. D., & Vdovina, O. A. (2018). Regional University Teacher: Evolution of Teaching Staff and Priority Activities. *European Journal of Contemporary Education*, *7*(4), 790-803. http://doi.org/10.13187/ejced.2018.4.790

Ritchey, K. A., & Smith, S. (2019). Developing a training course for undergraduate teaching assistants. *College Teaching*, *67*(1), 50-57. https://doi.org/10.1080/87567555.2018.1518891

Saalman, E. (2018). How do teachers reflect upon their teaching in teaching portfolios?–Analysis of teachers' portfolios at seminars on how to document your pedagogical qualifications and skills at the chalmers university of technology. In *International Symposium on Project Approaches in Engineering Education* (Vol. 8, pp. 148-154). https://research.chalmers.se/en/publication/509092

Silva, J. C., Pipa, J., Renner, C., O'Donnell, M., & Cefai, C. (2018). Enhancing teacher resilience through face-to-face training: Insights from the ENTREE project. *Resilience in education: Concepts, contexts and connections*, 255-274. https://link.springer.com/chapter/10.1007/978-3-319-76690-4_15

Skulmoski, G.J., Hartman, F.T., & Krahn, J. (2007). The Delphi Method for Graduate Research. *J. Inf. Technol. Educ., 6*, 1-21. https://www.learntechlib.org/p/111405/

Tacconi, G., Tūtlys, V., Perini, M., & Gedvilienė, G. (2021). Development of pedagogical competencies of the vocational teachers in Italy and Lithuania: implications of competence-based VET curriculum reforms. *European Journal of Training and Development*, *45*(6/7), 526-546. https://doi.org/10.1108/EJTD-03-2020-0041

Thao, N. P., Kieu, T. K., Schruefer, G., Nguyen, N. A., Nguyen, Y. T. H., Vien Thong, N., ... & Van Hanh, N. (2022). Teachers' Competencies in Education for Sustainable Development in The Context of Vietnam. *International Journal of Sustainability in Higher Education*, *23*(7), 1730-1748. https://www.emerald.com/insight/content/doi/10.1108/IJSHE-08-2021-0349/full/html

Tran, H. (2016). Professional learning and development (PLD) in higher education: The experiences of teacher educators in Vietnam. http://researcharchive.vuw.ac.nz/handle/10063/5137

Tyurina, V. O., Shevchuk, H. Y., Kriukova, Y. D., Lukashchuk, M. M., & Savishchenko, V. M. (2022). The impact of the project method on the development of leadership skills in students. https://doi.org/10.5430/JCT.V11N9P49.

Veniger, K. A. (2016). University Teachers' Opinions About Higher Education Pedagogical Training Courses in Slovenia. *CEPS Journal*., 6(4), 141–61. http://doi.org/10.25656/01:12763

Vietnam National Assembly. Resolution No. 29-NQ/TW dated November 2, 2013 of the 8th Central Conference of Faculty XI on Fundamental and Comprehensive Innovation in Education and Training. (2013). Available online: https://thuvienphapluat.vn/van-ban/Thuong-mai/Nghi-quyet-29-NQ-TW-nam-2013-doi-moi-can-ban-toan-dien-giao-duc-dao-tao-hoi-nhap-quoc-te-212441.aspx (accessed on 23 August 2023).

Vilppu, H. (2019). The effect of short online pedagogical training on university teachers' interpretations of teaching–learning situations. *Instructional Science., 47*(6), 679-709. https://doi.org/10.1007/s11251-019-09496-z

Vlasenko, K., Kondratyeva, O., Khyzhniak, I., Chumak, O., & Volkov, S. (2020). Developing Training Materials for the On-Line Course" Project Method in Teaching Higher Mathematics". In *ICTERI Workshops* (pp. 756-769). https://ceur-ws.org/Vol-2732/20200756.pdf

Winberg, C., & Winberg, S. (2017). Pedagogical competence for engineering educators: Re-conceptualizing teaching portfolios. In *2017 IEEE Global Engineering Education Conference (EDUCON)*, 431-436. IEEE. https://doi.org/10.1109/EDUCON.2017.7942882

Zvarych, I. M. (2013). Evaluation of Faculty Pedagogical Skills by Students at the Institutions of Higher Learning in Ukraine and USA. *Middle East Journal of Scientific Research*, *14*(1), 47-52. https://www.idosi.org/mejsr/mejsr14(1)13/9.pdf