

Proposing an online pedagogical competency framework for university lecturers: evidence from Vietnam

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ABSTRACT

This study proposes an online pedagogical competency framework for university lecturers that covers teaching, research, and community service. The study was conducted in two phases. First, a two-round Delphi online survey was conducted with 20 Vietnamese experts, who reached consensus on an online pedagogical competency framework. Second, an online survey was distributed and collected 235 valid Vietnamese university lecturers about their perceptions of the importance and performance of each competence. Confirmatory factor analysis was employed to evaluate the suitability of the online pedagogical competence. Additionally, importance-performance analysis was used to identify the strengths and weaknesses of their competencies. The proposed framework consists of 39 online pedagogical competencies, which were consensually categorized into three groups: teaching, research, and community service. Vietnamese university lecturers demonstrated strengths in online teaching but faced limitations in research and community service. The results also reveal that they perceive the performance levels of these competencies as falling short of the required level of importance. The proposed framework could be used to assess university lecturers' online pedagogical competencies, providing valuable insights for developing plans and policies to enhance them.

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1. INTRODUCTION

The growth of information and communication technology has encouraged online learning in higher education institutions, such as blended learning, online learning, digital learning, and massive open online course (MOOC)-based learning. Also, online learning has become the “new normal” in higher education institutions after the COVID-19 pandemic [1], [2]. Previous studies have pointed out the benefits and drawbacks of online learning. The benefits include better learner engagement, easier access for learners [3], improved learning outcomes and effectiveness [4], higher learner satisfaction [3], and diverse and rich learning resources [5]. However, online learning also shows some limits. These included the need for good infrastructure and technical requirements [6], adaptability and readiness of university lecturers and learners for online learning [5], lack of support from higher education institutions [7], interaction between university lecturers and learners, pedagogical methods and online teaching experience of lecturers [3]. This means university lecturers need the appropriate online teaching competencies and environments.

Moreover, university lecturers need to have online pedagogical competencies (OPCs) to work well in their teaching, research, and service missions [8]. However, previous studies have mainly focused on the online teaching competencies of university lecturers. Research and community service competencies in the online environment have not received much attention from the research community. For example, Redecker and Punie [9] proposed a digital competency framework for European educators (DigCompEdu). The suggested competencies help educators in general to teach effectively in the digital environment, including pedagogical, professional growth, and learner support competencies. Similarly, Falloon's study [10] also suggested a digital competency framework to support university lecturers in teaching effectively. Falloon's model combines the technological pedagogical content knowledge (TPACK) model by Koehler *et al.* [11] and the digital competency model by Janssen *et al.* [12]. This model has four components including TPACK, personal-ethical, personal-professional, and general digital competencies for teachers. In another study, Oanh *et al.* [13] created an online teaching competency framework for university lecturers. The authors suggested an online teaching competency framework with five competencies: Understanding student learning, Online session administration, Digital content development and learning facilitation, technology, and online learning outcomes assessment. Thus, there is a lack of research on OPCs of university lecturers to meet the missions of university lecturers. Moreover, Pham *et al.* [14] also recommends this as a potential research direction for online teaching in the post-COVID-19 context. Therefore, this study attempts to fill the above research gap by proposing an OPC framework for university lecturers covering their missions.

2. BACKGROUND

2.1. Online learning in Vietnamese higher education institutions

As in other countries, online learning in Vietnam has been encouraged by the COVID-19 pandemic and has become a common teaching method at Vietnamese higher education institutions. Moreover, Vietnamese higher education institutions have also set up fully online courses. For example, the National Economics University offers bachelor degrees in Business administration, Accounting, Banking, Economic law (<https://neu.edu.vn>), Ho Chi Minh City University of Science, Vietnam National University offers Information technology (<https://e-learning.vn>), and Thai Nguyen University offers Industrial management, Industrial enterprise accounting, and Construction engineering (<https://tnu.edu.vn>).

The development of online education in Vietnam is underpinned by its established system of legal documents. Specifically, Circular No. 08/2021/TT-BGDĐT, dated March 18, 2021, which promulgates the Regulations on university courses, includes provisions regarding the organization of online classes. These circular permits training institutions to conduct online classes provided they meet current regulations and ensure a quality standard equivalent to that of in-person classes. The online modality is allowed to constitute up to 30% of the total training program for both full-time and part-time students.

Furthermore, Circular No. 30/2023/TT-BGDĐT regulates the application of information technology in online education for higher education. This circular emphasizes the importance of ensuring the quality of online education, mandating that training institutions continuously improve their processes and content, and adopt advanced technologies. In the realm of vocational education, Circular No. 09/2017/TT-BLĐTBXH, dated March 13, 2017, governs the organization and implementation of online education programs. This circular provides guidance to vocational education institutions on the deployment of online education, ensuring adherence to quality standards and educational effectiveness. Moreover, the 10-year assessment of the implementation of Resolution 29 by the Vietnam Politburo [15] summarizes the achievements and limitations of Vietnamese higher education institutions. Concurrently, this document identifies the ongoing implementation of Resolution 29 as crucial for the fundamental and comprehensive reform of education and training, aiming to meet the demands of industrialization and modernization within the context of a socialist-oriented market economy and international integration. This creates a conducive environment for Vietnamese higher education institutions to integrate new technologies, including online education, into their educational processes.

However, university lecturers still face challenges in effectively implementing online education activities. Some of these include readiness for online teaching [16], development of open educational resources [17], online professional development [18], implementation of results-based assessment [19], and pedagogical issues [20]. This requires university lecturers in Vietnam to be equipped with OPCs suitable for the current and future development of online education.

3. METHOD

3.1. Research design

We designed the study in two stages, as illustrated in Figure 1, to propose an OPC framework for Vietnamese university lecturers and investigate their perception about the importance and performance of its

competencies. The first stage is a literature review aimed at proposing a theoretical framework that meets the missions of university lecturers in the online environment. We applied a two-round Delphi method, according to the guidelines of Shelton *et al.* [21] to identify OPCs according to the proposed theoretical framework. Delphi method was chosen due to its suitability for exploratory research [21] and its ability to identify in-depth knowledge based on expert consensus [22]. The threshold value for achieving consensus is 80% according to the recommendation of Micallef *et al.* [23]. Additionally, we calculate Aiken's V value to assess the reliability of the experts' evaluations, with a minimum value of 0.6 required [24].

The second stage is to investigate the status of the OPCs of Vietnamese university lecturers. We collected 235 valid responses regarding performance and importance levels of OPCs among Vietnamese university lecturers. Then, we conducted confirmatory factor analysis to examine whether the proposed measurement model fits the collected data [25]. Additionally, the results of the importance-performance analysis (IPA) revealed the current state of OPCs by identifying the strengths and weaknesses of their competencies [26].

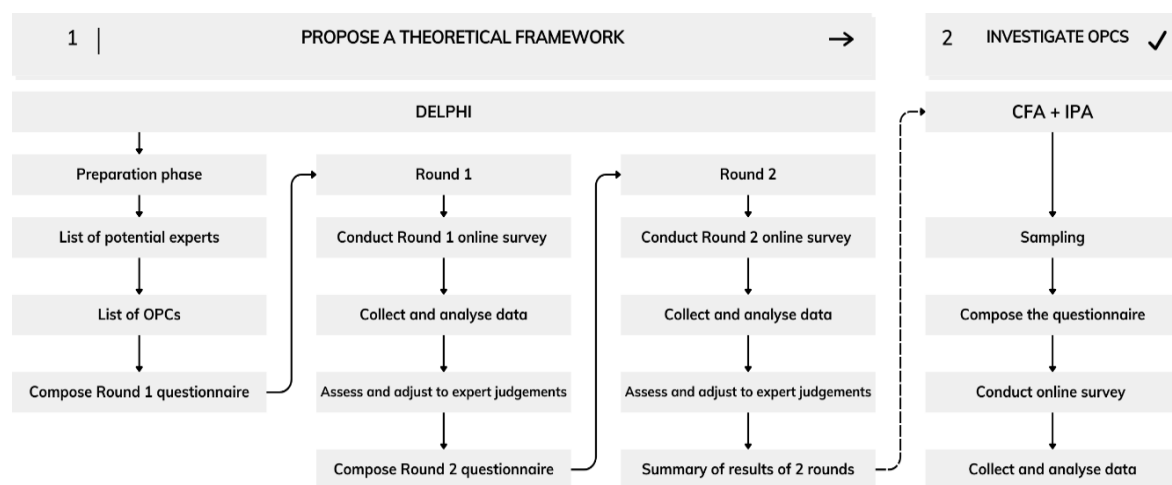


Figure 1. Research design proposing an OPC framework for university lecturers

3.2. Stage 1: proposal for theoretical framework

We proposed a theoretical framework for OPCs for university lecturers based on their missions, and focused on the teaching process. According to the American Association of University Professors [8], universities need to perform three missions: teaching, research, and service, with teaching as the fundamental one. For the teaching mission, we can consider various aspects such as roles [27], teaching activities [13], or the innovative teaching strategies of lecturers [28]. We approached teaching as a continuous process that is adjusted after activities during the teaching process; therefore, we apply Abdous's [28] model as the basis for proposing a theoretical framework for OPCs for university lecturers, as in Figure 2.

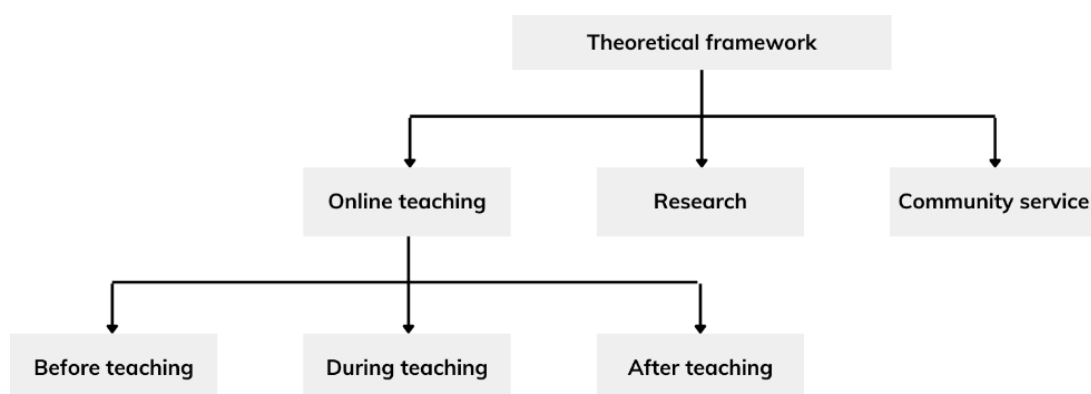


Figure 2. Proposed theoretical OPC framework

3.2.1. Preparation for Delphi survey

Before conducting the Delphi survey rounds, we carried out three preparatory steps. First, we proposed a set of criteria for identifying experts and listed 30 qualified experts. Second, we obtained a list of 48 OPCs for the expert judges. Third, a questionnaire was designed based on these OPCs and delivered in the first Delphi survey round. Detailed descriptions of these steps are presented in the following subsections.

a. List of experts

To prepare for the Delphi survey rounds, we followed three steps: proposing a list of experts, identifying the corresponding OPCs based on the proposed theoretical framework, and designing the questionnaire for the first Delphi survey round. We proposed a list of 30 experts who have participated in online training across various fields of study. Potential experts need to meet criteria to educational level, job position, university's location, online teaching experience, and training fields, as shown in Table 1. The number of experts was determined based on the recommendations of Shah *et al.* [29] and Riva *et al.* [30] to ensure reliability and relevance to the scope of the study. Additionally, we planned to collect expert evaluations in two rounds, with the number of experts withdrawing or not participating in each round being less than 40%, as reported in the study by Niederberger *et al.* [31].

Table 1. Criteria for proposing experts

ID	Criteria	Inclusion
1	Educational level	Doctor
2	Job position	University lecturer
3	Location	Vietnam
4	Online teaching experience	At least a year of online teaching
5	Training field	Education; art and humanities; natural sciences; business and management; information technology
6	Age	No limitation
7	Work experience	No limitation
8	Gender	No limitation

b. List of OPCs

To propose a list of OPCs, we conducted a literature review of the documents filtered by the study of Pham *et al.* [14]. A compilation of 328 pedagogical competencies relevant to online education for university lecturers was listed. Each competency underwent a process of review, evaluation, and subsequent categorization within the proposed competency framework. For example, “encouraging and motivating learners” was categorized under the competency group “during teaching”, “developing theories and models of online teaching and learning” was categorized under the competency group “research,” and “using digital technology and social media consciously” was categorized under the competency group “community service”.

Then, we consolidate the competencies based on their similarities. For example, the competency “motivate learners” is synthesized from the following competencies: Encouraging students to participate in online learning forums and share their knowledge and skills with classmates, Encouraging and motivating students in the digital environment, promote collaboration among learners in the digital environment, Promote learning through group activities with the contributions of participants, Promote interaction among learners in the digital environment, Motivating students in the digital environment, Encourage students to research, discuss, explore, present, demonstrate, and propose solutions to real-life situations in small groups. We obtained a list of 48 OPCs after this process.

c. Design of the first-round survey

The first-round survey was designed in a three-part structure. Part 1 provided information about the research topic, judgment guidelines, confidentiality commitment, and contact information of the research team. Part 2 collected demographic information of the experts, including full name, gender, age, educational level, job position, online teaching experience, training field, work experience, and teaching methods. Part 3 listed the competencies according to the proposed theoretical framework. Experts not only assess the relevance of each competency using a 5-point Likert scale (agree), but also provide feedback on expressing competencies and describing competency manifestations, and propose OPCs not yet included in the survey to the research team. The survey was compiled using Microsoft Word software.

3.2.2. Round 1 Delphi survey

We contacted the experts before sending the electronic survey via the Zalo application, a popular instant messaging service in Vietnam. The authors monitored the survey progress and contacted experts who had not submitted their evaluation forms after one week. For the experts who do not return the evaluation

forms after two weeks, we will contact them to confirm their willingness to participate in the survey. In round 1, four experts did not continue to participate in the survey. A total of 26 survey forms were collected, with a participation rate of 87%.

We compiled the evaluations and feedback from the experts using Microsoft Excel. Based on the experts' feedback, the authors reviewed and adjusted the competencies accordingly. The Aiken's V values of the competencies range from [0.72, 0.88], ensuring the reliability of the experts' level of consensus. 31 OPCs have achieved expert consensus. The remaining competencies were used to design the second-round survey. The second round survey consists of only two parts: research topic information and the competencies that did not reach consensus in the first round. In the project information section, we have included the results of the survey's first round.

3.2.3. Round 2 Delphi survey

Experts who participated in the first round of the survey continue to participate in the second round. The survey forms continue to be sent via the Zalo application. The authors remained in contact with the experts, communicating with them after one week of without receiving the evaluation forms and reconfirming their involvement after two weeks. A total of 20 experts participated in the second round of the survey, with a participation rate of 77%.

The experts' judgments and feedback were compiled in Microsoft Excel. Based on the experts' feedback, the authors reviewed and adjusted the relevant competencies. The Aiken's V values of the competencies range from [0.60, 0.93], ensuring the reliability of the experts' consensus. 8 OPCs achieved consensus among the experts. Summarizing the results after two rounds of surveys, 20 experts participated in both rounds, for a 67% participation rate. A total of 39 OPCs reached consensus among the experts. The number of competencies according to the proposed framework was described in Subsection 4.1.

3.3. Stage 2: investigate the status of OPCs of Vietnamese university lecturer

3.3.1. Questionnaire

The questionnaire was structured into three parts. The first provided information on the research topic, research objectives, instructions for answering, a commitment to confidentiality, and the research team's contact information. The second includes questions to collect demographic information from the respondents, including full name, gender, age, educational level, job, online teaching experience, training field, work experience, and teaching methods. The third lists 39 OPCs, gathering perceptions of both importance and performance using a 5-point Likert scale (1: not at all important/performance; 5: important/performance). The survey was created using the online platform SurveyMonkey (<https://www.surveymonkey.com/>). The survey was distributed through online platforms. We used the collected demographic information to exclude lecturers with no online teaching experience. After two months of data collection, from March 01 to April 29, 2025, 235 valid responses were collected. The demographic information of the respondents was presented in Table 2.

Table 2. Demographic and professional characteristics of respondents

Characteristics	n	Percent	Characteristics	n	Percent
Gender	235	100	Field of expertise	235	100
Male	86	36.6	Educational sciences	63	26.81
Female	148	62.98	Natural sciences	58	24.68
Other	1	0.43	Social sciences and humanities	47	20
Age	235	100	Business and management	38	16.17
26-30 years	8	3.4	Information technology	39	16.6
31-40 years	78	33.19	Other	27	11.49
41-50 years	117	49.79	Duration of online teaching	235	100
Above 51 years	32	13.62	Less than 1 year	32	13.62
Teaching experience	235	100	1-3 years	69	29.36
2-4 years	10	4.26	3-5 years	61	25.96
5-9 years	24	10.21	More than 5 years	73	31.06
10-14 years	50	21.28	Teaching modality	235	100
15-19 years	80	34.04	Blended/hybrid teaching	152	64.68
More than 20 years	71	30.21	Fully online teaching	145	61.7
Academic position	235	100	Digital competence	235	100
Administrative staff	49	20.85	Low proficiency	16	6.81
Lecturer	186	79.15	Relatively proficient	148	62.98
Academic title	235	100	Proficient	71	30.21
Professor	0	0	Professional training participation	235	100
Associate Professor	39	16.6	Attended at least one course	139	59.15
None	196	83.4	Did not attend	96	40.85

3.3.2. Data analysis

We conducted confirmatory factor analysis to examine whether the proposed measurement model fits the collected data [25]. Additionally, the results of the confirmatory factor analysis were used to measure the convergent and discriminant validity of the competencies in the proposed framework, according to study [32]). The analysis results need to meet the criteria for the chi-square, root mean square error of approximation (RMSEA), and comparative fit index (CFI) indices, as described in Table 3.

Table 3. Criteria for confirm factor analysis of the OPC framework

ID	Criteria	Source
1	χ^2/df (CMIN/df)<5	Backhaus <i>et al.</i> [25]
2	CFI $\geq$ 0.8	Kim <i>et al.</i> [33]
3	RMSEA $\leq$ 0.08	Backhaus <i>et al.</i> [25]
4	Cronbach' Alpha $\geq$ 0.7	Backhaus <i>et al.</i> [25]

We then applied IPA, proposed by Sun and Han [34], to determine the effectiveness and importance levels of the competencies in the proposed framework. The results of the IPA were presented in a two-dimensional diagram, with the vertical axis representing importance and the horizontal axis representing performance. Cut-off lines are determined based on the means of importance and performance, dividing the matrix into four areas: i) concentrate here (high importance-low performance); ii) keep up the good work (high importance-high performance); iii) low priority (low importance-low performance); and iv) possible overkill (low importance-high performance). For each OPC, a paired-samples t-test was used to investigate whether the performance level of a competency significantly differs from its importance level.

4. RESULTS AND DISCUSSION

4.1. OPC framework for Vietnamese university lecturers

After two rounds of evaluation, the experts reached a consensus on 39 online teaching competencies for university lecturers in Vietnam. Based on the theoretical framework, there are 29 competencies in the online teaching group, five competencies in the research group, and five competencies in the community services group. Thus, the number of competencies was concentrated in the online teaching group, which emphasizes the role of teaching duties in the teaching profession, as in Table 4 (see Appendix). Among the 29 online teaching competencies, 12 were before-teaching, 13 during-teaching, and 4 after-teaching. It can be said that the activities before and during teaching play an important role in the online teaching process.

We use Aiken's V value to assess the reliability of expert consensus. All values in the range [0.73, 0.93] exceed 0.6, indicating the experts' consensus. The competency with the lowest Aiken's V value is developing digital learning resources (S.5). On the contrary, the competency with the highest Aiken's V value is respect for culture (T2.12), as shown in Table 4.

Additionally, the frequency index of ratings 4 or 5 on the 5-point Likert scale and the percentage rate are used to assess the level of agreement among experts in the survey rounds. Table 4 summarizes these indicators for the competencies that achieved consensus among the experts. The results of the analysis of these indicators from the first and second rounds of the survey are summarized in Table 4.

Although the competencies in Table 4 all achieved consensus among the experts, the OPCs had varying levels of opinion dispersion. There are two OPCs with evaluation levels in the range of [4, 5], 19 competencies with evaluation levels in the range of [3, 5], 11 competencies with evaluation levels in the range of [2, 5], and seven competencies with evaluation levels in the range of [1, 5]. This indicates that there are still conflicting evaluations in many competencies, for example, prepare for online session (T1.1), respect the differences (T2.13), and support learners to study effectively (T3.3).

We included the competency of research organization (R.2) despite not reaching a consensus among experts in both rounds. We recognize this as an important competence, indispensable in the research activities of lecturers. This competency is essential for lecturers' professional growth [35], improving teaching methods and students' educational experience [36], and is stipulated as a duty of lecturers at higher education institutions in Vietnam [37]. Other competencies that did not reach a consensus were not included, for example, design assessment tools, analysis of learning outcomes data.

4.2. Status of OPCs of Vietnamese university lecturers

To investigate the state of OPCs of Vietnamese university lecturers, we surveyed online platforms. A total of 381 responses were received, of which 235 (61.68%) were valid, and 146 (38.32%) were invalid due to non-compliance with the respondent criteria, as in Table 1. We performed confirmatory factor analysis

(CFA) analysis on these valid responses. The measurement model was determined based on the OPC framework, which includes online teaching, research, and community service competencies. The minimum input for a good model fit was illustrated in Table 3. Our research results indicated a satisfactory model fit, with $\chi^2/df=2.512$, $CFI=0.817$, and $RMSEA=0.08$. The reliability values for the online teaching, research, and community service competencies scales were 0.95, 0.82, and 0.88, respectively. These values meet the minimum criteria for a good model. This indicates that the collected data is consistent with the proposed framework.

The results of the IPA analysis for the OPCs of Vietnamese university lecturers were conducted, and the IPA diagram was shown in Figure 3. The analysis results indicate that the importance levels of online pedagogical competencies range from [4.14, 4.68], with the competency of developing a learning community (S.04) having the lowest importance level, and the competency of lesson planning (T1.03) having the highest importance level. On the other hand, the lecturers' performance levels range from [3.86, 4.43], with Developing a learning community (S.04) having the lowest value, and Selecting lesson planning (T1.03) having the highest value.

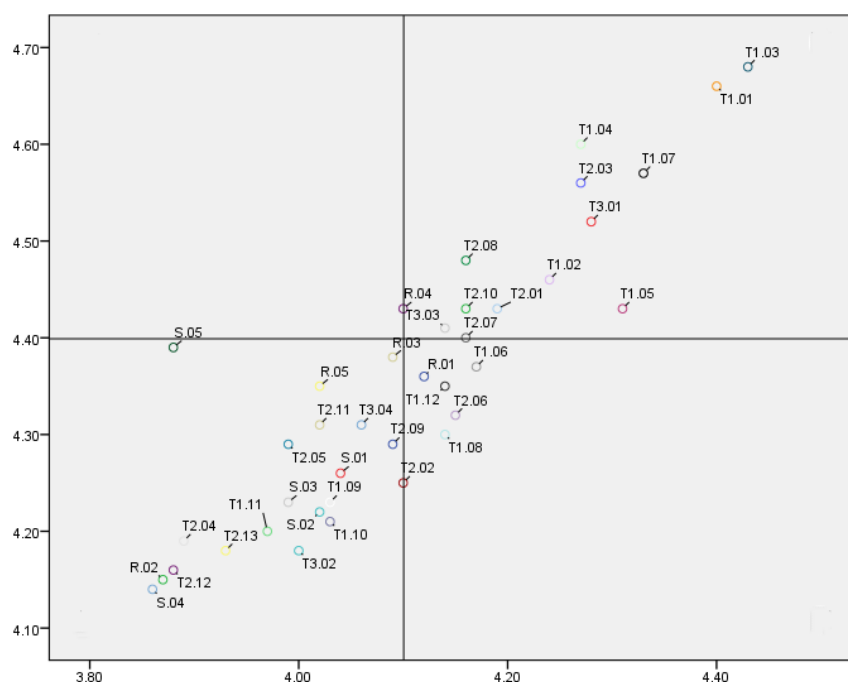


Figure 3. IPA diagram of OPCs of Vietnamese university lecturers

The difference between the importance and performance values for the competencies ranged from [0.13, 0.50], and this difference is statistically significant based on the paired sampling t-test. The lowest difference was found in the competency of information and communication technology (ICT) skill (T1.05), while the greatest difference was observed in the competency of developing digital learning resources (S.05). All values are greater than 0, indicating that lecturers consistently rate the importance of OPCs higher than theirs.

Based on the IPA results, OPCs were grouped as presented in Figure 3. Quadrant II (high important-high performance) included 13 competencies that need to be maintained: T1.01, T1.02, T1.03, T1.04, T1.05, T1.07, T2.01, T2.03, T2.07, T2.08, T2.10, T3.01, T3.03. Quadrant I (high important-low performance) included 1 competency that Vietnamese university lecturers should improve in performance: R.04. Quadrant IV (low important-high performance) included 19 competencies that Vietnamese university lecturers put more effort into implementing than necessary: T1.09, T1.10, T1.11, T2.04, T2.05, T2.09, T2.11, T2.12, T2.13, T3.02, T3.04, R.02, R.03, R.05, S.01, S.02, S.03, S.04, S.05. Quadrant III (low important-low performance) includes 6 competencies that were less important and performed worse than others: T1.06, T1.08, T1.12, T2.02, T2.06, R.01.

When considering the groups of OPCs, the online teaching competency (T) were placed in Quadrant IV, with the before teaching competency (T1) in Quadrant II, the during teaching competency (T2) in

Quadrant III, and after teaching competency (T3) in Quadrant IV. The research (R) and community service competencies (S) were both in Quadrant III. When comparing the importance and performance levels across the groups, the online teaching competencies were the most effectively implemented. Within the online teaching competencies group, those competencies assessed as highly important and highly effective (falling in Quadrant II) appear at different stages throughout online teaching process. These competencies were highly valued and effectively executed, and it was essential to encourage the continued maintenance of these competencies, for example, prepare for online session (T1.01), Provide feedback on assessment results (T2.01), and Support learners to learn effectively (T3.03).

Among the competencies in OPC framework, only one competency was rated with a higher level of importance than performance (Q1), which was critical thinking (R.04). This suggested that Vietnamese university lecturers need to improve the effectiveness of this competency to align with its level of importance. The OPCs with a higher level of performance than importance (Quadrant IV) was primarily concentrated in the online teaching competencies group, for example, Management and exploitation of digital resources (T1.08), and use online assessment tools effectively (T2.06).

The remaining competencies fell into the group with low importance and low performance (Quadrant III). These competencies appear across various groups of OPCs and were primarily concentrated in the community service competence, for example, learn new technology (T1.11), create a friendly learning environment (T2.09), manage and monitor learning activities (T3.04), organizing research (R.02), and developing a learning community (S.04). These competencies were focused on helping Vietnamese university lecturers establish a friendly and effective learning environment.

4.3. Discussions

The form of online teaching at the higher education is gradually becoming popular worldwide, requiring university lecturers to equip themselves with appropriate pedagogical competencies to effectively carry out their professional activities. This study has proposed an OPC framework that met the missions of university lecturers. Vietnamese experts in various training fields reached a consensus on 39 competencies, moreover, CFA results showed that OPC framework fit the professional activities of university lecturers in Vietnam. This means the OPC framework is not only suitable theoretically but also relevant to Vietnam's practical context. Vietnamese university lecturers focus primarily on teaching; while research and community service missions may be limited, they are integral components of a lecturer's profession. Additionally, the findings also indicated that proposed framework was suitable for various fields of training. Specifically, the training fields involving experts included education, art and humanities, natural sciences, business and management, and information technology.

On the other hand, the research evaluates expert consensus across various fields, so there is both concentration and dispersion in expert opinions on OPCs. Consensus-based competencies among experts are essential in training fields. Conversely, competencies that lack expert consensus are not entirely suitable for specific training fields. There are 11 competencies rated in the range of [2, 5] and seven competencies rated in the range of [1, 5], as in Table 3. This shows that different training fields require different OPCs. The fields of natural sciences and engineering require higher competencies in using simulation tools, virtual experiments, specialized software, and complex visualization methods, while the fields of social sciences and humanities emphasize the ability to coordinate in-depth online discussions, encourage critical thinking, facilitate multidimensional interactions, and utilize rich digital resources [38], [39]. In addition, the level of technology integration and the use of various online tools lead to the specificity of training fields [40].

On the other hand, experts engage in various forms of teaching, including blended learning and online teaching. This shows that the pedagogical competency framework is not only suitable for fully online teaching but also for blended online and face-to-face teaching. We suggest that educational researchers investigate OPCs specifically among university teachers in each group.

The number of online teaching competencies predominates over other competencies in the proposed OPC framework. This aligns with the teaching role in the professional activities of university lecturers, which is a fundamental mission as mentioned in the document [8]. On the other hand, Vietnamese university lecturers have not emphasized research competencies. The evidence shows that experts did not reach consensus on the capacity to organize research. This is a suggestion for educational institutions to enhance their research capabilities in the online environment for university lecturers, to improve the quality of education and training, and to enhance the rankings of educational institutions in global university rankings.

Additionally, the strengths of Vietnamese university lecturers' OPCs are focused on effectively conducting teaching activities in online environments. However, competencies within the community service, which support the creation of a friendly and effective educational environment, are limited. This suggests that educational administrators and lecturers should enhance the quality of online education by strengthening the role of these competencies and/or improving their performance levels in this group.

The research results also indicate that Vietnamese university lecturers have not yet fully adapted to the online environment, as reflected in the performance levels of related competencies such as Management and exploitation of digital resources, Adjusting the pace of online teaching, and using online assessment tools effectively. This highlights the need to improve the performance of lecturers' competencies through professional development activities in the online environment. Higher education institutions can implement policies to encourage lecturers to actively participate in training activities and/or develop training plans that meet the specific requirements for their online education.

5. CONCLUSION

Online education is becoming increasingly popular among higher education organizations. To perform their jobs effectively in an online setting, university lecturers must possess pedagogical competencies. This paper proposes an OPC framework for university lecturers encompassing teaching, research, and service. Using a two-round Delphi survey, Vietnamese experts' consensuses on 39 OPCs, including 29 online teaching, 5 research, and 5 community service competencies. The Aiken's V index was used to guarantee the research was reliable. CFA results show that OPC framework is appropriate for Vietnamese university lecturers. They have strengths in online teaching competencies but limitations in research and community service. The results also indicate that they perceive the level of performance of these competencies as not meeting the required level of importance. Higher education institutions can use the research findings to assess their faculty's OPCs, resulting in capacity-building strategies and policies that encourage them to engage in self-professional development.

Based on the findings, we recommend that researchers and university managers continue concern following directions: i) develop an OPC framework for university lecturers in fields of study not covered by this research; ii) develop an OPC framework specifically for instructors in specialized training fields; iii) implement an assessment of the current state of OPCs for university faculty; iv) develop criteria for evaluating the levels of OPCs for university lecturers; v) develop training programs for university lecturers; vi) propose policies to encourage university lecturers to enhance their OPCs; and vii) investigate the impact of lecturers' cognition on the OPC framework.

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C : **C**onceptualization

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O : Writing - **O**riginal Draft

E : Writing - Review & **E**diting

Vi : **V**isualization

Su : **S**upervision

P : **P**roject administration

Fu : **F**unding acquisition

CONFLICT OF INTEREST STATEMENT

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

This is to confirm that the participants have provided the necessary informed consent. During the distribution of the questionnaire, the respondents were explicitly notified of the voluntary nature of their involvement. The individuals were notified that the data provided would exclusively be utilized for academic purposes.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [D-HL], upon reasonable request.

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APPENDIX

Table 4. List of OPCs of Vietnamese university lecturers

Code	Competence	Min	Max	Mean	SD	f(4,5)	%f(4,5)	Aiken's V
T	Online teaching competency (29 competencies)							
T1	Before teaching (12 competencies)							
T1.1	Prepare for online session	1	5	4.23	0.86	24	92.31	0.81
T1.2	Provide online course information	3	5	4.50	0.65	24	92.31	0.88
T1.3	Lesson planning	3	5	4.31	0.68	23	88.46	0.83
T1.4	Choosing a method to evaluate learning outcomes	3	5	4.35	0.69	23	88.46	0.84
T1.5	ICT skill	1	5	4.31	0.97	22	84.62	0.83
T1.6	Program development	3	5	4.30	0.66	18	90.00	0.83
T1.7	Developing teaching content	2	5	4.40	1.00	20	80.00	0.81
T1.8	Management and exploitation of digital resources	3	5	4.23	0.59	24	92.31	0.81
T1.9	Teaching process and criteria	1	5	3.96	0.87	21	80.77	0.74
T1.10	Set up course rules	3	5	4.31	0.68	23	88.46	0.83
T1.11	Learn new technology	3	5	4.19	0.69	22	84.62	0.80
T1.12	Compliance with teaching regulations	4	5	4.58	0.50	26	100.00	0.89
T2	During teaching (13 competencies)							
T2.1	Provide feedback on assessment results	3	5	4.46	0.65	24	92.31	0.87
T2.2	Adjusting the pace of online teaching	3	5	4.50	0.65	24	92.31	0.88
T2.3	Effective communication	2	5	4.50	0.81	23	88.46	0.88
T2.4	Identify and handle conflicts	2	5	4.27	0.83	22	84.62	0.82
T2.5	Manage online sessions	2	5	4.31	0.88	21	80.77	0.83
T2.6	Use online assessment tools effectively	2	5	4.35	0.80	23	88.46	0.84
T2.7	Use effective teaching methods	3	5	4.35	0.75	22	84.62	0.84
T2.8	Motivate learners	2	5	4.44	0.96	21	84.00	0.82
T2.9	Create a friendly learning environment	2	5	4.46	0.81	23	88.46	0.87
T2.10	Organizing assessment activities	3	5	4.27	0.67	23	88.46	0.82

Table 4. List of OPCs of Vietnamese university lecturers (continue)

Code	Competence	Min	Max	Mean	SD	f(4,5)	%f(4,5)	Aiken's V
T2.11	Effective learning organization	2	5	4.27	0.96	21	80.77	0.82
T2.12	Respect culture	4	5	4.70	0.47	20	100.00	0.93
T2.13	Respect the differences	1	5	4.55	1.15	19	95.00	0.89
T3	After teaching (4 competencies)							
T3.1	Adjust teaching content	3	5	4.52	0.65	23	92.00	0.84
T3.2	Online presence	1	5	4.38	1.06	24	92.31	0.85
T3.3	Support learners to learn effectively	1	5	4.50	1.07	24	92.31	0.88
T3.4	Manage and monitor learning activities	3	5	4.40	0.76	21	84.00	0.81
R	Research (5 competencies)							
R.1	Information competence	3	5	4.29	0.55	23	95.83	0.74
R.2	Research organization*	1	5	3.80	1.01	13	65.00	0.70
R.3	Respect copyright and intellectual property rights	2	5	4.54	0.71	25	96.15	0.88
R.4	Critical thinking	3	5	4.38	0.70	23	88.46	0.85
R.5	Applying research to practice	3	5	4.08	0.74	20	76.92	0.77
S	Community service (5 competencies)							
S.1	Digital security and effective use of digital technology	3	5	4.36	0.81	20	80.00	0.80
S.2	Sharing expertise	3	5	4.46	0.58	25	96.15	0.87
S.3	Active cooperation	3	5	4.35	0.63	24	92.31	0.84
S.4	Developing a learning community	2	5	4.23	0.95	21	80.77	0.81
S.5	Developing digital learning resources	2	5	3.90	0.85	16	80.00	0.73

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