Journal of Education and e-Learning Research
Vol. 10, No. 3, 502-512, 2023
ISSN(E) 2410-9991 / ISSN(P) 2518-0169
DOI: 10.20448/jeelr.v10i3.4893

Proposing a process for training online teaching competence for lecturers at higher education institutions

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Abstract

Online teaching has become an inevitable trend in education as technology and engineering advance. It is necessary to train and foster online teaching competence for lecturers at higher education institutions. This article uses the literature review and the theoretical method to analyze the existing proposals on models and frameworks of online teaching competency by many different authors worldwide. Based on the discovery of the commonalities and gaps between these perspectives combined with analyzing the characteristics of online teaching at the university level, the article proposes a framework of online teaching competencies for the higher education faculty along with relevant knowledge related to these competencies. This framework includes eight competencies with specific performance criteria. This article also builds a process for training online teaching competence for lecturers at higher education institutions. According to the PDCA deeming cycle, this process consists of three stages: planning, implementation and improvement to support lecturers in adapting to the virtual teaching environment.

Keywords: Framework of online teaching competencies, Higher education lecturer, Online teaching competence, Online teaching, Process of training online teaching competence, Teacher training.

Citation | Chi, D. P., & Oanh, D. T. K. (2023). Proposing a process for training online teaching competence for lecturers at higher education institutions. *Journal of Education and E-Learning Research*, *10*(3), 502–512. 10.20448/jeelr.v10i3.4893
History:
Received: 27 March 2023
Revised: 16 June 2023
Accepted: 31 July 2023
Published: 10 August 2023

Publisher: Asian Online Journal Publishing Group

Funding: This research is supported by the Ministry of Education and Training, Vietnam (Grant number: CT2022.06.SPK.02)
Institutional Review Board Statement: The Ethical Committee of the Ho Chi Minh City University of Technology and Education, Vietnam has granted approval for this study (Ref. No. 03/DHSPKT-KHCN).
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: Abstract, introduction, literature review, research methodology, results and discussion and conclusion; D.P.C.; research methodology and results and discussion, D.T.K.O. Both authors have read and agreed to the published version of the manuscript.

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Contribution of this paper to the literature
This article proposes a framework of online teaching competencies for lecturers at higher education institutions and suggests a process of training online teaching competence for higher education faculty which can be applied in a long-term and circular manner at universities to meet teaching requirements in the context of the 4.0 industry.

1. Introduction

Human knowledge is increasing as a result of technological advancement. Human teaching and learning require more modern and effective forms of implementation to create convenient conditions for people to study anywhere, anytime. The fourth technology revolution (industry 4.0) with the development of the Internet of Things (IoTs), artificial intelligence (AI), big data and virtual reality (VR) has facilitated virtual classes. E-learning courses are taking place widely worldwide. In other words, the change from the traditional education model to online education is an inevitable trend to meet the requirements of the 4.0 industrial revolution.

Educational challenges play an important role in the COVID-19 pandemic (Sherbersky *et al.*, 2021; Trevisan *et al.*, 2023). A challenging issue for teachers is how to ensure that learners through online courses maintain learning effectiveness and quality in comparison to traditional teaching methods. Since digital pedagogy is still a relatively new field, research results in this field are still lacking and have limitations.

Teaching model 4.0 with the application of science and technology creates a change in the learning environment leading to a change in the way of learning and teaching. There are many factors affecting the quality of online teaching and learning. The teacher plays a key role and has a direct influence on the learners' learning, in order to have quality online courses; it is necessary to have qualified teachers to teach online and effective, feasible and easy-to-implement online teaching training programs. A detailed study of online teaching competencies (also known as a teacher's digital pedagogical capacity) is crucial to identify scientific and practical ways. The development of a process for training the online teaching competence of higher education faculty is also an important issue in order to contribute to the training and retraining of pedagogical human resources to meet the very urgent requirements of the education era and ensure the quality of online teaching in the context mentioned above.

2. Literature Review

2.1. Online Teaching Competence

Pelz (2010), (Professor of Psychology at Hermimer County Community College (USA), the winner of the Sloan Association's Award for Excellence in Online Teaching) offers three principles that lecturers should comply with to have effective online teaching: (1) The lecturer should let students do most of the work because the more students spend time on the content, the more they will learn. (2) The lecture needs to maintain interaction in asynchronous learning. (3) The lecturer should be present and promote presence including in social, cognitive and teaching settings.

According to O'Neil *et al.* (2009), online teaching is more than the delivery of learning content in a virtual environment. Online courses need to be implemented according to optimal pedagogical methods with the active assistance of technology to help students have a high-quality learning experience (McVay Lynch, 2002). The appropriate and effective pedagogy for online teaching requires a student-centered approach using active teaching methods and techniques that stimulate the interaction and presence of students and lecturers (O'Neil *et al.*, 2009). O'Neil's research team also believes that understanding the psychological foundations, educational theories can assist us in designing and operating an effective online teaching environment. Three psychological theories mentioned by the O'Neil group are: (1) Behavioral theory. (2) Social cognitive theory. (3) Constructivist theory.

Many teachers think that they must be computer experts to teach online. Ko and Rossen (2004) assert in their book "Teaching Online: A Practical Guide" that online instructors are not necessarily the best online instructors in terms of technology, "an interest in pedagogy should come first, technology second". It is important to make technology a tool to facilitate the learning of course content (O'Neil *et al.*, 2009). In terms of the pedagogical competencies of lecturers participating in online teaching, Roddy *et al.* (2017) identified the following skills and competencies: (1) Communication skills. (2) Technological competence. (3) Provision of informative feedback. (4) Administrative skills. (5) High responsibility for creating learning motivation for learners. (6) Provide support for students.

According to the "*National Standards on Online Teaching Quality*" within the "Project of Quality Matters and Virtual Learning Leadership Alliance" based on the analysis and synthesis of resources from the Michigan Institute for Virtual Teaching Research the QM library (*Q*uality *M*atters Research Library) contains more than 1,200 references that have been focused by experts on the topic of online teaching from PhD dissertations, academic websites, the sources found by online search support tools, the virtual academic storage Research Gate and Academic.edu and the standards of the teacher's online teaching competencies have been arranged into the following competence groups: (1) The ability to master knowledge related to the basic concepts and structures of online instruction to create effective learning experiences for students. (2) The ability to use technologies including existing and emerging tools to conduct online teaching successfully. (3) The ability to plan, design and use active instructional strategies to encourage online participation, interaction and collaborative learning. (4) The ability to define learning goals and expectations clearly and respond quickly and frequently. (5) The ability to guide and promote the legal, ethical and safe use of technology in a virtual environment. (6) The ability to meet the diversity of student learning needs through the incorporation of facilities into the online environment. (7) The ability to assess learning outcomes in online learning environment with the validity and reliability of assessment tools and procedures. (8) The ability to provide standards-based assessments, projects and assignments to help students achieve the learning goals and to measure learning progress by determining of student's achievements in comparison with their learning goals. (9) The ability to use assessment data and other data sources to improve teaching content and support students in online learning. (10) The ability to interact effectively with colleagues, parents and other members of the community. (11) The ability to arrange media and content for effective teaching

in an online environment (Shattuck and Burch, 2018).

According to Spector and De La Teja (2001), online teaching competence has focused on skills related to the use of technology and requirements for successful coordination, creating favorable conditions for online discussions and conversations. In the online synchronous discussions, the online instructor should (1) establish the basic rules for the discussion, (2) create an interactive animation with the minimum intervention of the instructor, (3) imagine how online text messages can appear with remote learners and (4) be aware of cultural differences.

Albrahim (2020) asserts that online teaching skills for lecturers are based on reviewing the works of many colleagues worldwide which include six skill groups: (1) Pedagogical skills (2) Content skills (3) Design skills (4) Technological skills (5) Skills in management and organization (6) Social skills and communication. Albrahim's teaching skills still have some points that have not yet been clarified and fully expressed in an online teaching environment.

Farmer and Ramsdale (2016) have developed an online teaching competence matrix (OTC)including five areas of competence: (1) Community and communication ritual (2) Positive teaching (3) Teaching design (4) Tools and technology (technological competence) (5) Leadership and guidance. Accordingly, corresponding to each competence group, they divide the specific implementation criteria into three levels of operation: emerging level, developing level and proficient level. The competence matrix of Farmer & Ramsdale (in describing the expressions of each competency group) tends to be in the technical direction, i.e. it focuses on the application of technical technology without clarifying the online teaching strategies the pedagogical art in connection with positive teaching concepts and methods or the application of appropriate learning theories in teaching design. The scales of some competencies are not very complete and convincing such as technological competence or leadership and guidance competence. Even the leadership and guiding competencies described in this matrix can be integrated into active teaching competence.

Spector and De La Teja (2001) made a list of eight roles performed by online instructors: (1) technologist, (2) designer, (3) administrator or manager, (4) learning facilitators, (5) mentors, (6) evaluators, (7) researchers and (8) content facilitators. In defining these roles, the research team went on to identify the competencies that online instructors need for each of the roles they perform in the online teaching process. The online teaching competency framework proposed by the authors still has a theoretical "gap" on the expression criteria of mentoring competence. This competence has not been analyzed for performance criteria.

In a study of agricultural education, Dooley and Lindner (2002) identified the necessary competencies to succeed in online teaching in the form of synchronous and asynchronous learning. They proposed the core competency framework for online teaching lecturers which includes the following components: (1) Adult educational theory (2) Knowledge of technology and techniques (3) Teaching design (4) Communication skills (5) Graphic design (6) Administration issues. Each of these core competencies is expressed through specific low-to-high development rated behaviors. However, the behavioral manifestations for each of the proposed core competencies do not fully represent all aspects of competency. For example, the competence of "teaching design" only stops at the level of designing lesson plans, teaching lesson plans and determining teaching objectives. However, it has not been clarified what the relevant behaviors are to prepare effective online teaching lesson plans such as how to apply teaching models, theories and strategies in the online teaching environment, how to choose teaching methods and technical means or tools in online teaching and assessment etc. Moreover, the technology and technical competence described in behavioral manifestations are still imprecise, too brief and do not cover all the necessary technological capabilities of an online instructor. The communication competence in this proposal has not mentioned how to communicate between lecturers and students, how to advise, support, give feedback etc.

In addition, there are many other authors researching the online teaching competencies for lecturers such as Dubins and Graham (2009) who checked seventeen online learning programs. They proposed eight types of online teaching competence: (1) System management skills and content management skills. (2) Technical skills. (3) Teaching design competence. (4) Competence in being present during the online teaching and social processes. (5) Assessment of management competence. (6) Ability to guide learners. (7) Knowledge of institutions. (8) Pedagogical competence and teaching methods. The proposal of Dubins and Graham (2009) is quite comprehensive. However, some manifestations of the abilities of online lecturers such as ability to mentor , guide learners, their communication skills and their research capacity have not been recognized and emphasized in this proposal.

Bigatel *et al.* (2012) pointed out seven types of competence needed to perform successful online teaching tasks including: (1) Positive learning competence. (2) Management and leadership competence. (3) Abilities for conducting positive teaching and giving feedback. (4) The ability to use multimedia technology. (5) Classroom decoration competence. (6) Technological competence. (7) Policy enforcement competence. Bigatel's proposal has overlapping parts for example, technological competence already includes the ability to use multimedia. Furthermore, the competence related to the use of learning theories has not been mentioned while decorating the classroom is listed as a necessary competence.

The Maryland Online organization proposes nine competencies to teach online successfully including: (1) the ability to orient students to study online. (2) Technological skills. (3) LMS skills (skills related to the online *L*earning *M*anagement *S*ystem). (4) Knowledge of basic teaching design principles (5) Pedagogical competence and teaching methods. (6) Ability to be present (in the online teaching process and social processes). (7) Capacity to ensure internet safety. (8) Competence of management on assessment. (9) Competence related to understanding and applying specific legal and institutional policies and procedures (MOL-Maryland Online, 2014).

The Turkish authors Zmirli and Kırmacı (2017) in their research identified the following competencies related to online teaching: (1) The ability to engage students and encourage presence (2) Capacity to develop social, teaching and awareness presence (3) Competence to prepare digital resources, materials and related instructions (4) The ability to explore ideal methods for developing effective communication (5) Pedagogical competence related to learning contents (6) Technical capacity (7) The ability to observe individual differences (8) Mastery of adult learning theory. The identification of the online teaching competencies by the authors Zmirli and Kırmacı (2017) has not mentioned or considered the teaching design competence, abilities regarding management, administration and institutions, leadership capacity or competence relating to advising and supporting learners.

In Vietnam, studies on online teaching and digital pedagogy are still relatively limited. Studies focusing on the difficulties of online teaching began only five years ago. Hop (2022) has proposed a digital pedagogical competency framework for vocational education teachers including four competence groups: (1) Determining teaching strategies in the digital environment. (2) Making teaching plans in the digital environment. (3) Implement teaching in a digital teaching environment. (4) Cooperation in the development of online courses. However, this competency framework is aimed at vocational training teachers so it does not cover all the aspects of online teaching competencies.

Each proposal from different authors has its own strengths and weaknesses. The following groups are identified: (1) Pedagogical competence related to teaching organization. (2) Pedagogical competence related to teaching content. (3) Teaching design competence. (4) The competence to use techniques and technology. (5) Competence related to management and institutions. (6) Social competence is related to communication and being present. (7) Leadership and guidance competence. (8) Abilities of advisory, orientation and support for learners. (9) Research competence. (10) Competence in mastering pedagogical theories. (11) Ability to evaluate and facilitate the evaluation. (12) Competence related to graphics design.

2.2. Training of Online Teaching Competence

Spector and De La Teja (2001) argue that teacher training and the issue of certification are confirmations that a person has acquired the competencies related to the teaching profession and online instructors need to be trained in teaching competencies that focus on the online environment.

Méndez *et al.* (2022) conducted a study in Spain on the digital competence of teachers and the digital competency training program that they received through a survey. The survey results show that the training for the online teaching competency they received was mainly through instructions on the internet and consultation with colleagues. Therefore, the Méndez team argues that formal training in digital competence is required for instructors to ensure quality education.

The study by Pinto-Santos *et al.* (2022) in Latin America analyzed and evaluated four levels of development of digital teaching competency (DTC) among 252 faculty members at the University of La Guajira in Colombia. The research results show that up to 78.2% of 252 instructors identify that their DTC is only at the first two levels (beginner and intermediate). The Pinto-Santos group has argued that the teacher training process must include training in digital teaching competency to promote the professional development of university lecturers.

Ersin *et al.* (2020) from two different universities in Istanbul and Turkey designed an e-practicum (e - pedagogical internship) course for pedagogical students who are pre-service teachers in the COVID-19 period. A virtual classroom consisting of twenty five pedagogical students and six pedagogical students acted as teachers conducting synchronous online teaching through Zoom for other pedagogical students who acted as students under the mentorship of a university supervisor (e-mentor). After the online pedagogical practice session, the pedagogical students acting as students gave feedback to the "teachers". This is a peer-review process in a virtual environment. The e-mentor (university faculty) also provided e-counseling for "teachers". This is an assessment from the instructor or coach. Finally, each "teacher" (i.e. pedagogical student) reflects on his or her own online teaching experience. This is a self-assessment process. Research results show that pedagogical students find e-practicum useful because it helps them overcome their fear of teaching online.

Another study by Zmirli and Kırmacı (2017) in Turkey revealed the necessity of online teaching competency training and how to train online teaching competencies for lecturers. Thirty lecturers participated in the study. In the majority (f=24, 80%) of universities, the need for online teaching competency training is determined in some way. In addition, almost all universities (f=27) offer online competency-based training activities. Most universities (f=26) organize this competency training for their own faculty. There are twenty one universities that give priority to *synchronous teaching*. Twelve universities have these mandatory training courses for their lecturers. Four universities said they *issued certificates* at the end of the training. Eleven universities presented their training courses through an *asynchronous platform*. Furthermore, twenty three universities provided *technology subjects* in online teaching competence training, eight universities provided *pedagogical subjects* and only four universities taught *both*. Zmirli and Kırmacı (2017) argued that universities need to teach both subjects and commented that the contents of the training activities lack systematic pedagogical theories and social, perception and teaching presence.

In 2019, Ho Chi Minh City University of Technology and Education (HCMUTE) in Vietnam collaborated with the University of Arizona (US) to provide training on how to conduct MOOCs (*M*assive *O*pen *O*nline *C*ourse*s*) for lecturers. However, lecturers at UTE still have to learn and develop other aspects of online teaching competencies without any formal training from the university (Nguyen, 2023).

Thus, it can be seen that the online teaching competence training for university lecturers lacks professionalism. In some places, lecturers mainly have to self-educate, self-study on the internet and exchange with colleagues. On the other hand, training may take place either in synchronous form or on an asynchronous platform. However, this training is still focused on technical competency but has not been comprehensively combined with pedagogical competence in online teaching. The training of online teaching competence is also fragmentary according to each locality and region. There have not been formal studies on the process of training online teaching competence for university lecturers.

3. Research Methodology

3.1. Research Subjects

This study aims to identify (1) a framework for the core competencies of lecturers who teach online at higher education institutions. (2) A process for training online teaching competence for lecturers at higher education institutions.

3.2. Research Strategies

We use the following process to standardize the core competencies of lecturers who teach online at higher education institutions:

Step 1: Review some proposals for online teaching competencies for lecturers according to some existing research worldwide carefully analyze, compare and evaluate these options and detect gaps in reasoning to supplement and enrich the literature.

Step 2: Analyze the characteristics of students and lecturers who participate in online learning and teaching at higher education institutions to identify the requirements for the online teaching competence of lecturers.

Step 3: Based on the researched contents in steps 1 and 2, propose a framework for the online teaching competence of lecturers at higher education institutions including defining the components of the competence framework and the performance criteria of each competence component.

Step 4: Propose a process of training online teaching competence for lecturers based on modern pedagogical and scientific basics including (1) The Addie instructional design method. (2) Events of instruction and their relation to processes of learning (Gagne *et al*., 1992). (3) A four-step process of organizing active and experiential training methods (Oanh, 2022) in cohesion with the Deming cycle (plan, do, check, act) for continuous improvements.

3.3. Research Method

This study uses the *theoretical research method* to systemize the concepts and conclusions of previous research regarding the research topics and give arguments on the gaps and similarities between these perspectives. Analysis, generalization and synthesis will be employed to search for terms related to the research subjects such as online teaching competence models or frameworks, issues of training online teaching competence. This study supplies a systematic description of dialectical relationships between problems and gives solutions for proposing a process of training online teaching competence for lecturers at higher education institutions based on a comprehensive understanding of terms and concepts related to the research problem.

4. Results and Discussion

4.1. Propose a Framework of the Core Competencies of Lecturers Who Teach Online at Higher Education Institutions

4.1.1. Review Existing Proposals for Online Teaching Competencies

Some perspectives and reasoning on the online teaching competencies of lecturers were carefully analyzed, compared and evaluated in the aforementioned literature review. The research team identifies the clusters of competencies that are widely accepted by international scholars as the basis for proposing a competence framework. This comparison is demonstrated in Table 1.

Although each view or models of different authors has its own strengths, weaknesses and theoretical gaps, it is possible to identify some of the competencies required for instructors to carry out successful online teaching such as: (1) Ability to use technology and techniques. (2) Ability to design online teaching (including grasping pedagogical theories, learning theories. (3) Ability to organize active online learning. (4) Ability to evaluate and facilitate the assessment in the online teaching environment. (5) Social competence, communication and being present in the online teaching environment. (6) Competence related to management, governance and institution. (7) Ability to mentor, guide and support learners.

4.1.2. Features of Online Teaching at Higher Education Institutions

The characteristics of online teaching at higher education institutions are analyzed as one of the bases for the recommendation of a framework of core competencies for lecturers.

4.1.2.1. The Characteristics of Students

Online teaching has advantages over traditional learning for example, it has the ability to break down geographical barriers, offers the potential for a more flexible, tailored learning environment that can adapt according to students' knowledge and skills and their preferred learning styles (Sambrook, 2003).

Undergraduate students are capable of self-control and self-regulation when participating in online learning (İzmirli and Kırmacı, 2017) and basically understand how to use the necessary technical tools for the online learning process.

During the learning process, they have a need to be respected, to communicate and to exchange ideas.

They need clear instructions and a variety of digital learning resources.

4.1.2.2. The Characteristics of Higher Education Faculty (Lecturers)

Lecturers are supposed to have competence related to doing scientific research in the process of working at higher education institutions. Besides, doing research is a tool for life-long learning while as "life-long learning as a response to ongoing globalization and the shift towards knowledge-based economies" was recognized by the European Commission (Napal *et al*., 2018).

Lecturers at universities are advisors, orientators and facilitators for students to study by themselves in deep thinking, questioning, discussion and creative problem solving with the help of technological tools in an online learning environment.

Lecturers are responsible for building a positive online learning environment, promoting the role of students in participation and interaction in the learning, assessment and self-assessment processes through their regular presence and active communication through various technology channels.

Lecturers understand the institutional policies of higher education institutions, organize online learning management in accordance with them.

Research competence is an important specific competency that must be possessed by university lecturers. As science and technology advance continuously so the digital technologies used to deliver online instructions. Additionally, educational science is also constantly changing to suit global demand. Lecturers of the 21st century must possess skills that allow them to guide students through technology- enabled learning (Cantón Mayo *et al*.,

2020; Garzón *et al.*, 2020). Thus, it is necessary to add *"research competence"* to the identification of core competencies for lecturers who teach online at higher education institutions.

Table 1. Compare the views or models of online teaching competence discussed by a number of different authors in the world.

Authors	Pedagogical competence related to active teaching	Competence related to the design of teaching content	Competence related to teaching design	Competence is related to the technological tools.	Competence in management, administration and institutions	Social competence is related to communication, community ritual and presence	Competence in leading and giving instructions	Competence in advisory, orientation and support for learners	Competence in doing research	Competence related to pedagogical theory (adult learning theory, learning theories	Competence related to evaluation, feedback and facilitation of evaluation	Competence is related to graphics design
Albrahim (2020)	x	X	X	x	x	x				X	x	
Shattuck and Burch (2018)	x	X	X	x		x	x				x	
Roddy *et al.* (2017)				x	x	x		x			x	
İzmirli and Kırmacı (2017)	x	X		x		x				X	x	
Farmer and Ramsdale (2016)	x		X	x		x	x					
MOL-Maryland Online (2014)	x		X	x	x	x		x			x	
Pelz (2010)	x		X			x		x				
O'Neil *et al.* (2009)	x	x		x		x				X		
Dooley and Lindner (2002)			X	x	x	x				X		x
Spector and De La Teja (2001)	X			x	x	x	x					
Goodyear *et al.* (2001)	X	x	X	x	x			x	x		x	

4.1.3. Proposing a Framework of Core Competencies for Lecturers Teaching Online at Higher Education

Many online teaching competency models have been proposed by researchers worldwide to evaluate these options: supplementing and enriching the theory. The researchers propose *a framework of core competencies for lecturers teaching online at higher education institutions.* This set of core competencies includes eight groups with specific behavioral performance criteria for each competency. This proposal can be a reference tool as a basis for further research on training processes and measures fostering the online teaching capacity of lecturers at higher education institutions. This framework is demonstrated in Table 2.

Table 2. A framework of core competencies of lecturers teaching online at higher education institutions.

Nr.	Core competencies	Behavioral manifestations of competence	Relevant pedagogical knowledge
1	*Ability to use technology and techniques*	1.1. Using many types of technological equipment for online teaching: Desktops, laptops, smartphones, tablets, camcorders, cameras etc. 1.2. Using basic and popular technology tools as the foundation for online teaching such as PowerPoint design, email, internet browsers, LMS, text chat applications, common teaching software and applications (such as Zoom, Google Meet, MS Teams, etc.). 1.3. Using diverse extended or advanced software and tools supporting online teaching and evaluation (such as Kahoot, Google Form, Canvas, Padlet, Quizzes, Moodle, Camtasia, etc.). 1.4. Coordinating many different technology channels to create maxim bbnbbbum conditions for online learning (such as Zalo, Messenger, YouTube, E-Porfolio, Blog, Google Meet, Google Classroom etc.) 1.5. Handling situations arising in the process of teaching online using technologies. 1.6. Using software to check for plagiarism, determine	*Teaching technology: Knowledge of hardware; The knowledge of software, tools and applications used to teach online; Knowledge of LMS.* *Knowledge of information technology and related computers.*

Nr.	Core competencies	Behavioral manifestations of competence	Relevant pedagogical knowledge
		scientific integrity (Such as turnitin). 1.7. Understanding the function, scope of use and limitations of different technological tools and means.	
2	*Ability of online teaching design*	2.1. Understanding students and identifying their characteristics: motivation, learning needs, psychological characteristics and physical age, background knowledge, online learning circumstances, social characteristics (gender, field, local. 2.2. Designing learning goals according to the principle of SMART (*S*pecific, *M*easurable, *A*chievable, *R*ealistic, and *T*ime bound) and according to the revised cognitive Bloom taxonomy. 2.3. Selecting teaching strategies in an online learning environment based on analysis, selection, coordination and application of learning theories (behavioral theory, cognitive theory, constructive theory, connection theory, learning theory for adults, cognitive load theory, learning style etc.) and online teaching models (synchronous teaching, asynchronous teaching, blended teaching, teaching through MOOCs, CoI model, online cooperation learning model OCL etc.). 2.4. Building a course outline and design learning content based on learning goals, characteristics of learners, scientific logic, pedagogical logic and learning conditions (online learning equipment) of learners. 2.5 Selection of teaching methods and forms of learning organization in interaction direction, taking learners as a center (learner - centered teaching), suitable for the selected online teaching model and conditions of technical tools, equipment, technology application. 2.6. Designing learning tasks that motivate students to learn, discover debate, explain, present, handle situations, solve problems and create. 2.7. Selecting methods and forms of learning results assessment and designing tools to evaluate in the direction of competence development in accordance with the conditions of technical tools, equipment and applications. 2.8. Designing a variety of digital learning resources that are accessible and meet many different learning styles.	*Pedagogical psychology.* *Learning theories: behavioral theory, cognitive theory, constructive theory, connection theory, cognitive load theory, learning style, learning theory for adults etc.* *Didactics:* *Designing learning objectives;* *Designing learning content;* *Teaching methods, forms and techniques.* *Assessment methods, forms.* *Digital pedagogy:* *The models or forms of organizing teaching online.*
3	*Ability to organize active online learning*	3.1. Using teaching methods that promote positive learning, the students' inquiry, discovery and problem-solving ability and stimulate their interaction and participation in the online learning process. 3.2. Organizing individual or group learning activities using digital media and tools. 3.3. Facilitating and maintaining discussions, exchange and cooperation among students. 3.4. Using simulation software, virtual reality and technology tools to support students' online practice. 3.5. Giving timely and regular feedback to students during online learning through many channels (e-mail, LMS, sms, Zalo, Zoom, Google Meet, etc.)	*Didactics* *Pedagogical content knowledge (PCK)* *Teaching technology*
4	*Ability to evaluate and facilitate assessment in the online teaching environment*	4.1. Selecting an assessment strategy to evaluate learning results that is appropriate to the learning objectives, learning content and based on the use of appropriate and feasible digital tools and devices; 4.2. Using criteria and assessment tools that are clearly designed and made available to learners. 4.3 Encouraging learners to self-assess and participate in peer assessment, open assessment in the online learning environment.	*Assessment in education* *Didactics* *Teaching technology*
5	*Social competence, communication and being present in the online teaching environment*	5.1 Applying the "ice breaking" technique to create a warm and attractive learning atmosphere. 5.2 Maintaining friendly and interactive dialogue in written or spoken language through technology applications (e-mail, LMS, Zalo, Zoom, Google Meet, video, etc.). 5.3 Creating a sense of regular presence through various	*Pedagogical psychology* *Pedagogical communication* *Building MOOCs*

Nr.	Core competencies	Behavioral manifestations of competence	Relevant pedagogical knowledge
		technology channels such as video presence (in synchronous teaching), answering questions, sending instructions, announcements, feedback, video lectures etc. regularly through LMS (in asynchronous teaching) and active support throughout learning process through multiple channels (e.g. e-mail, video chat, text messaging, etc.). 5.4. Using clear and understandable language. 5.5. Creating a warm, friendly learning atmosphere, showing enthusiasm and humor (if possible). 5.6. Respecting cultural diversity and differences. 5.7. Promoting an environment of respect and equality in the classroom, and resolving conflicts in a friendly manner. 5.8. The ability to role-play and act with fluent, warm language in front of the camera to create vivid lecture videos. 5.9. The ability to communicate and collaborate in a friendly way with the video production team (videographers, directors, graphic artists, etc.)	
6	*Competence related to management, governance and institutions*	6.1. Establishing and declaring rules and regulations for participation, assignment submission and communication protocols. 6.2. Managing the course time and apply time-saving techniques. 6.3. Demonstrating commitment to the institutional policies of the higher education institution. 6.4 Complying with copyright, scientific ethics and legal issues. 6.5. Maintaining a non-authoritarian, democratic and inclusive style in the classroom.	*Classroom management.* *Scientific research methodology.*
7	*Ability to mentor, guide and support learners.*	7.1. Orienting students on how to communicate online, how to interact, work in groups and study attitudes. 7.2. Consulting, discussing with students during the implementation of individual or group learning tasks. 7.3. Giving support and advice to students when they encounter technological problems during their studies.	*Pedagogical psychology* *Pedagogical communication*
8	*Competence in doing research*	8.1 Performing scientific research on online teaching. 8.2 Carrying out educational and scientific studies. 8.3 Doing research and updating the knowledge and skills to use new software, tools and equipment in online teaching.	*Scientific research methodology*

4.2. Proposing the Process of Training Online Teaching Competence for Lecturers at Higher Education Institutions

4.2.1. Scientific Basics for Proposing the Process of Training Online Teaching Competence for Lecturers

Training is an activity deployed at identified times to support individuals in revising, updating and developing professional knowledge, skills and attitudes for implementing working tasks at their current position or in the future. Training activities should be organized according to a scientific process with closed linkage steps to achieve the highest purpose of developing professional competencies for the individual. This study proposes a process of training online teaching competence for lectures based on scientific basics as follows:

(1) The Addie instructional design method is a method used to create educational and training programs. Addie is an abbreviation for the five stages of development: analysis, design, development, implementation and evaluation. The Addie instructional design technique requires that each stage be completed in the correct order with an emphasis on reflection and iteration. This sequence does not require a precise linear progression through the steps (Spatioti *et al.*, 2022) and it is conceivable to integrate "design" and "development" into a shared step (Shelton and Saltsman, 2006). The Addie instructional design method is used for both face-to-face and online learning design and instruction (Shelton and Saltsman, 2006), English courses online (Balanyk, 2017) and blended learning (Yao, 2021) in higher education and vocational education at the college level.

(2) Instructional steps (Gagne *et al.*, 1992) include gaining attention, informing the learner of the objective, stimulating recall of prerequisite learning, presenting the stimulus material, providing learning guidance, eliciting the performance, providing feedback about performance correctness, assessing the performance and enhancing retention and transfer.

(3) A four common step process of organizing active and experiential training methods (Oanh, 2022) are: 1) Transfer learning tasks. 2) Engage learners in solving learning tasks. 3) Encourage learners to present or report outcomes. 3) Assess and summarize.

(4) The Deming cycle (plan, do, check, act) is used for continuous improvements: The quality of training in online teaching competence for lecturers could be continuously improved through planning, doing, checking and

acting. While "plan" and "do" are integrated into planning and organizing, "check" and "act" are immersed in "improving" the quality of training online teaching competence for lecturers.

The scientific basics for the design, instruction and organization of active and experiential teaching mentioned above are of great insight in shaping a process of training online teaching competence for lectures. To meet the demand for developing online teaching competence for lecturers, the process of training online teaching competence for lecturers consists of three main stages, including (1) Plan (2) Organize and (3) Improve. "Plan" is the directional and supportive stage. "Organize" and " improve" are two intrinsic stages of the process of training online teaching competence for lecturers and directly affect the quality of training this competence. The "organize" stage engages with two steps of a teaching and training process namely "implement" and "improve" directed by continuous improvements based on two stages namely "check" and "act" of the PDCA (*Plan*, *Do*, *Check*, *Act*) cycle. The process of training online teaching competence for lecturers shows the interaction through the three stages of steps, activities and actions. Specific steps, activities and actions corresponding to each stage of the process of training online teaching competence for lecturers are presented in Figure 1.

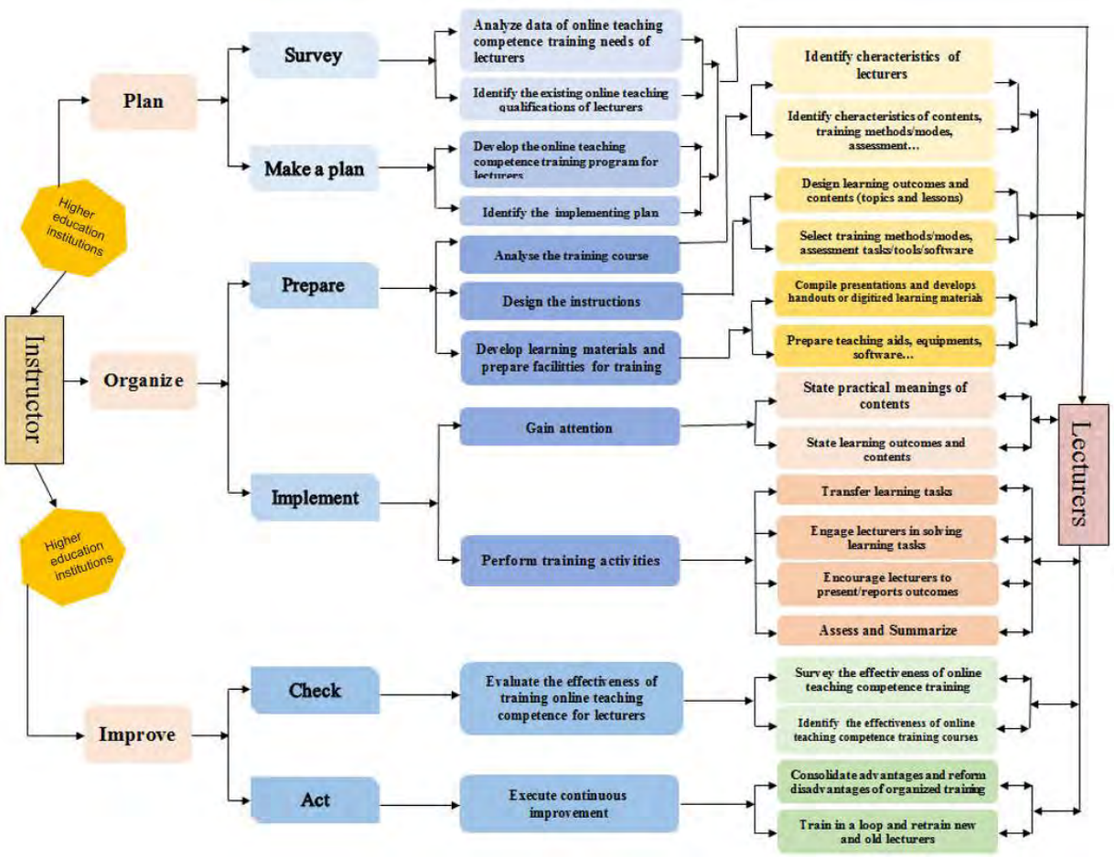

Figure 1. Process of training online teaching competence for lecturers.

4.2.2. The Process of Training Online Teaching Competence for Lecturers

The three stages, steps and activities of training online teaching competence that can be applied in face-to-face and online training are further analyzed in the following section.

Stage 1: Plan training for online teaching competence for lecturers

The first stage includes two main steps namely " survey" and " make a plan". Before training online teaching competence for lecturers, higher education institutions (HEIs) conduct a survey of online teaching competence training needs and the existing online teaching qualifications of lecturers through a questionnaire (with a large number of lecturers) an interview (with a small number of lecturers) or a combination of both questionnaire and interview. Qualitative and quantitative data is carefully analyzed to identify the needs of contents, training methods and modes as well as the existing online teaching qualifications of lecturers. These findings provide a practical basis for making a specific plan for training online teaching competence for lecturers with an online teaching competence training program. HEIs have to develop a specific syllabus consisting of: (1) Target groups: young or old lecturers, levels of online teaching qualification of lecturers. (2) Objectives, learning outcomes, contents, training methods or modes, theory and practical time, forms and methods of assessment. (3) Training time and facilities. Apart from the syllabus, the implementing plan such as time, place, and requirements for training is also clearly identified.

Stage 2: Organize training for online teaching competence for lecturers

"Prepare" and "implement" are the main steps of the second stage. The activities and actions of these two steps are similar to a teaching process. This statement will explain by describing activities and actions in every step as follows:

Step 1: Prepare: To prepare for online teaching competence training, the instructor analyzes the training course, designs instructions, develops learning materials and prepares facilities for training.

Regarding the training course analysis, the instructor should focus on some characteristics such as (1) the characteristics of learners (knowledge, skills, experience in face-to-face and online teaching). (2) Course purposes and course learning outcomes. (3) Training contents associated with component competencies of online teaching

competence. (4) Training modes (online teaching, hybrid teaching and blended teaching). (5) Training methods (self-directed group work, Socratic dialogue, demonstration, case study, project-based learning). (6) Assessment (assessment tasks and tools such as checklist, rubrics, grading or online assessment software such as Quizzes, Mentimeter, Poll Everywhere, Edmodo. (7) Course administration (organize subjects or lessons according to module structure on LMS and online learning platforms, manage components of LMS and online learning platforms, track or monitor student participation and interaction in synchronous and asynchronous online and face-to-face learning activities). (8) Time (for the entire training course or theory and practice for each content) and training support conditions (classrooms, equipment and facilities).

The results of the course analysis provide the basics for the instructor to design instructions in more detail. Instructions should be well prepared including (1) learning outcomes based on the SMART principle (specific, measurable, attainable and timely). (2) Learning contents (basic and advanced contents corresponding to theory or practical time to foster online teaching competence for lecturers). (3) Select training modes and methods. (4) Design assessment tasks or tools and consider whether online assessment software will be matched with assessment tasks or tools. (5) Conditions and teaching aids. (6) Design the interface and overall structure of the online course. Based on the learning objectives and contents stated in the course outline, the instructor: (1) Compiles multimedia presentations (audio, images, video and graphics. (2) Develops handouts or digitized learning materials in multimedia form (text, textbook, images, graphics, video clips). (3) Constructs learning tasks, plans to organize learning activities corresponding to each learning task (time, location, means and internet connection). In addition, the instructor uploads learning materials on the training website which can be integrated into the existing learning management system. With practical contents, the instructor needs to build samples, practice situations or instructions for software installation, equipment use and prepare facilities for training such as teaching aids, equipment and software. The preparation step has an influence on the formation of the active learning mind for lecturers: With SMART learning outcomes and logical, clear instructions and easily accessible learning materials, lecturers will self-construct a flexible study plan to participate in and fully implement the learning tasks of the course.

Step 2: Implement: The scientific orientation for the implementation step of training online competence is based on the learning characteristics of lecturers who have experience in learning and professional activities. So, activities are carried out based on the lecturer (learner-centered teaching) to foster lecturers' ability to study proactively and experientially. There are two main activities namely "Gain attention" and "Perform training activities" and actions corresponding to each activity. These activities and actions are not only a combination of nine events of instruction and their relation to processes of learning (Gagne *et al*., 1992) with the 4-common step process of organizing active and experiential training methods (Oanh, 2022) but also the integration of assessment of learning outcomes into training activities. The following suggestions should be considered to get the attention of lecturers: (1) Point out the relationship between the lesson and the formation of the ability to solve difficulties and obstacles in online teaching. (2) Encourage lecturers to share good practices or experiences in online teaching (3) Discuss with lecturers situations or difficulties in online teaching. (4) State real-life situations arising in the design, teaching and assessment of learning outcomes in online teaching through stories, images, and videos. In addition, learning outcomes and a lesson content structure also need to be explained clearly and concisely.

Specific actions to perform training activities are closely linked with the four step process of organizing active and experiential training methods (Oanh, 2022) as below:

(1) Transfer learning tasks: Depending on learning topics (basic, advanced, specialized online teaching topics), lecturers will require new knowledge and skills through performing various learning activities corresponding to learning tasks (case study, mini-project, practice, presentation). These learning tasks enhance lecturers to study in-depth theoretical aspects through solving case studies, practicing online interaction software or online course administration. The instructor needs to clearly explain clearly learning tasks, criteria for assessment and allotted time while transferring learning tasks to lecturers. On the other hand, digital learning resources should be delivered to support lecturers in doing learning tasks individually or in-groups.

(2) Engage lecturers in solving learning tasks: individuals or groups perform tasks according to the allotted time. In the process of performing tasks, the instructor monitors and provides timely support. The close interaction among the instructor and lecturers helps the process of training online teaching competence without wasting time and achieving learning outcomes. The instructor needs to form interactive channels (in person or online) to facilitate lecturers to perform learning tasks more effectively.

(3) Encourage lecturers to present or report outcomes: individuals and groups report on the results in the form of presentations, product displays. Lectures comment on, supplement and discuss the results. The instructor gives feedback on the performance and outcomes of individuals and groups, emphasizes strengths and limitations and gives suggestions for adjustments and supplements.

(4) Assess and Summarize: the instructor assesses the performance and outcomes of individuals and groups based on the informed criteria. The instructor emphasizes the basic and advanced, specialized online teaching knowledge and skills applied to solve the learning task. Lecturers summarize the learning content, adjust it and add satisfactory aspects when performing tasks.

Stage 3: Improve the quality of training in online teaching competence for lecturers

"Improve" is a crucial activity in every training process. "Improve" will be executed based on the " check" and " act" of the Deming cycle (plan, do, check, act). To improve the quality of training online teaching competence for lecturers, HEIs identify the effectiveness of online teaching competence training courses for lecturers by conducting (1) a survey of the evaluation of trained lecturers on the advantages or disadvantages and levels of applying knowledge and skills of online teaching competence training courses for lecturers in online teaching. (2) A survey of the evaluation of students participating in online learning taught by trained lecturers about the quality of online teaching by these lecturers. Based on findings about the effectiveness of online teaching competence training courses, HEIs will (1) consolidate advantages of organized training courses. (2) Reform and revise the disadvantages of organized training courses. (3) Remove or add new training contents according to the development of technology in education. (4) Train in a loop and retrain new and old lecturers based on the needs of

training online teaching competence. In summary, the process of training online teaching competence for lecturers begins with the " plan" followed by the " organize" and finally the " improve" stage. Each stage has specific steps, activities and actions to be taken by the instructor and the lecturers in interactive and reciprocal relationship. Activities in the "plan" stage and activities or actions in the "prepare" stage affect the preparation and learning mindset of the lecturers. This process of training online teaching competence is proposed not only based on modern pedagogical and scientific basics but also immersed in the four step Deming cycle for continuous quality improvement.

5. Conclusion

With the development of science and technology, the trend of online teaching has grown increasingly popular with the development of science and technology. Virtual universities have appeared and could become one of the forms of education in the future in higher education. The training of online teaching competencies for university lecturers requires professionalization and a methodical training process based on understanding of online teaching competencies and pedagogical theories of teaching organization. The online teaching competency framework and the process of training online teaching competency for lecturers at higher education institutions proposed in the article could be a reference tool for higher education institutions in improving the quality of online teaching competence training as well as improving the quality of online teaching to cope with the explosive digital teaching era.

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