Integration of Technology During the COVID-19 Pandemic: Experience, Challenges and Needs of Thai EFL Teachers

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Article information	Abstract
	COVID-19 has led to an abrupt change from traditional classrooms and face-to-face learning to emergency online learning. The outbreak of COVID-19 in Thailand in early 2021 forced school closures and increased online learning. Students were not given a choice but to study at home. This study reports on the experience and challenges of language teachers from Thai universities who taught in emergency online settings. It examined their needs for future professional development courses. An online survey was completed by 120 EFL teachers from 52 universities across Thailand. Of these, six also participated in an online semi-structured interview. The survey findings revealed that 108 teachers (90%) had never taught online previously. ZOOM and Google Meet were among the most popular virtual meeting platforms. Support from their universities, as reported in the survey, included providing basic information and communications technology (ICT) skills workshops (75.8%), and providing workshops on integrating technology into classrooms (51.7%). The main challenges relating to online learning are the absence of a physical setting and a lack of interaction between students and teachers. In terms of future professional development needs, the data indicated that most teachers do not need courses in fundamental ICT skills or courses that expose them to a range of online technology tools. They do, however, need additional approaches to enhance their online teaching abilities, as well as certain teaching techniques to enable them to apply their pedagogical expertise while using specific technological tools or applications with which they are familiar. On the basis of these findings, pedagogical implications are discussed.

INTRODUCTION

The COVID-19 pandemic and higher education

All human activities globally have been affected by the COVID-19 outbreak, resulting in major changes in human-related activities (Onyema et al., 2020). Worldwide university pedagogy has changed greatly in response to the global pandemic, and attempts to control the virus's spread have impacted higher education institutions, which have shifted away from face-to-face teaching toward digital learning (Oyedotun, 2020).

Thailand was the first country outside China to report a new case of COVID-19, which occurred in Bangkok on January 13, 2020 (Intawong et al., 2021). The need for educational reformation in response to the outbreak has risen exponentially in Thailand. Beginning in July 2020, blended learning (BL) consisting of online and onsite learning was released to serve the needs of technology integration in Thailand (SEAMEO Regional Centre for Higher Education and Development [SEAMEO RIHED], 2021). Since then, COVID-19 cases have continued to increase in Thailand (Charoensuthipan, 2021). Subsequently, students were not given a choice but to study at home.

From March 2021 to the writing of this article (as the pandemic continues), all higher education institutions (HEIs) in Thailand started running full-scale online learning systems to reduce congestion and the risk of disease transmission in accordance with a state of emergency declaration in Thailand (Jiang et al., 2021). This has a significant impact on teaching at all universities across Thailand. Prior to the declaration of the state of emergency, certain universities located distant from the COVID-19 incidents did not have an all-online teaching policy. Several universities began with distance classes and then switched to on-campus teaching. However, upon the declaration of an emergency, all teachers, without exception, are required to teach online.

Emergency remote teaching has emerged as a common alternative phrase used by online education researchers and educators to distinguish between emergency remote teaching and online teaching during the COVID-19 pandemic (Hodges et al., 2020). While online teaching is carefully planned, emergency remote teaching is a response to urgent situations. Online teaching also allows for scheduling flexibility, whilst emergency remote teaching allows for teaching and learning to continue even under lockdown, and students may not have a choice but to study online during the pandemic (Hodges et al., 2020).

Emergency remote teaching is a new concept for educators and practitioners. This phrase was not used by many researchers following COVID-19 (e.g., Bozkurt & Sharma, 2020; Green et al., 2020). During the pandemic, researchers still use the phrase Online Learning/ Online Teaching (Almazova et al., 2020; König et al., 2020) to denote teaching and learning. Thus, this study's review of the literature focuses on the use of the terms online teaching and online learning.

Clearly, not all teachers are prepared for the online classroom setting. Many instructors struggled with basic technology skills, with familiarity with new teaching platforms, with technology

integration, with online classroom management, and with how to engage online learners. And many continue to need professional development training. As a result, the aim of this study is to investigate more about the experiences and challenges of university teachers who have taught in emergency online settings, as well as their needs for future professional development courses. This research is comprised of two research questions.

1. What are the experiences and challenges of EFL teachers from Thai universities who have taught in emergency online settings?
2. What are their needs for future professional development courses?

LITERATURE REVIEW

Online education: Challenges in Thai contexts

The notion of online learning is not novel for Thai higher education as it has been studied and discussed previously by a number of researchers (e.g., Boonmoh et al., 2021; Kuama & Intharaksa, 2016; Thongsri et al., 2019). However, during the pandemic era, this learning approach has been revisited and discussed controversially among educators, scholars, administrators, and other stakeholders (e.g., students and their parents) relative to its implementation, benefits, and challenges.

In light of Thailand's pandemic, online education is introduced as a means of coping with the disruption. Online education is unavoidably related to the use of technology (i.e., web-based materials or software). Teachers in higher education are required to learn and internalise ICT skills for teaching students. Online education has provided several benefits to students; however, there are some challenges that are described in the next section.

Online education has been implemented in Thai university contexts; higher education teachers and students have been forced by the sudden COVID-19 pandemic to work and study at home entirely. Unavoidably, the stakeholders (i.e., teachers and students) have encountered both benefits and drawbacks of the use of online education (Jiang et al., 2021; Tadesse & Muluye, 2020). Based on previous studies (e.g., Jiang et al., 2021; Tadesse & Muluye, 2020), the global COVID-19 pandemic affects the ongoing health of higher education students in the Asia Pacific region, including Thailand, due to online learning challenges. Overall, anxiety was reported to be the most significant problem among the students, followed by depression and stress (Jiang et al., 2021). Tadesse and Muluye (2020) indicate that the COVID-19 pandemic has affected schools, students, teachers and parents in developing countries. Some disadvantaged students are from schools or rural areas with less ICT infrastructure and fewer educational resources. During online teaching, disadvantaged students then lack the appropriate digital infrastructure required to deliver teaching remotely. The results from the study revealed that during the closure of schools, levels of anxiety, depression disorders and stress were high among students.

Especially, high impacts on teachers due to online learning were frequently mentioned during the COVID-19 pandemic (Almazova et al., 2020; König et al., 2020). Almazova et al. (2020)

reported the challenges and opportunities for Russian higher education amid COVID-19 as the teachers had problems with computer literacy level, the university electronic environment and support, academic staff readiness and students' readiness for online learning. König et al.'s 2020 study demonstrated that teachers in Germany need to adapt to online teaching during COVID-19 school closures. The teachers from the study were required to have digital competence as well as teaching competence in order to teach online. From all of the above, the teachers in the COVID-19 were led to prepare themselves in terms of needed skills and competence in teaching online.

From these circumstances, online learning seems to be considered a trigger to force teachers to have competence in online teaching (Almazova et al., 2020; König et al., 2020). During online learning, the evaluation, assessment, and teaching pedagogy are expected to be well-designed to engage the learners and promote learning (Ally, 2004). Teachers, who are also stakeholders, need to be well prepared for online learning. Essential skills for online language teachers need to be highlighted.

Skills needed for online language teachers

Technological Pedagogical Content Knowledge (TPACK): Basic knowledge

To become an effective and proficient online language teacher, technological pedagogical content knowledge (TPACK) needs to be the focus of online language teachers (Koehler & Mishra, 2009). TPACK is not a novel concept in higher education, on the other hand, it has been heavily focused by educators. Previous scholars (Aisyah et al., 2021; Mishra & Koehler, 2006; Niess, 2011; Shulman, 1986) have addressed how TPCAK covers content, pedagogy, and technology knowledge. In order to teach, teachers need to know when, where, and how to combine these three sets of knowledge harmoniously and proportionately. In particular, Aisyah et al. (2021) clearly pointed out that TPACK is needed for teachers because pedagogical content knowledge represents the knowledge in teaching and content, while technology knowledge represents the knowledge in technology, including its adaptation, organization, and integration in class. TPACK refers to basic knowledge, such as when a teacher learns and teaches the subject matter and comprehends how technology can be incorporated into their teaching to improve students' learning experiences (Koehler & Mishra, 2009).

However, teachers seemingly are expected to have advanced skills to enhance their online teaching competence. Compton (2009) clearly addressed the framework adapted from Hampel and Stickler (2005) for clarifying the skills needed for online language teaching, as seen in Figure 1.

Framework of skills needed for online language teaching: Advanced skills

Hampel and Stickler (2005) presented their online teaching skills in the form of a pyramid to indicate that the skills "build on one another, from the most general skills forming a fairly broad base to an apex of individual and personal styles" (p. 316). In other words, the model indicates that the lower-level skills have to be achieved before the higher-level skills can come to fruition.

To gain a better understanding, the clarification of each level of the model is presented in the following sections.

Level 1: Basic ICT competence: On the first level, one must be competent in the use of networked computers, including the use of keyboard and mouse, and have familiarity with common commands and applications. For example, using the basic functions of Microsoft Word or PowerPoint.

Level 2: Specific Technical Competence for the Software: At the second level, one must possess skills in using specific software. One must know how to apply any software before using it, for example, knowing the differences between the features of Zoom and Microsoft Teams (Hampel & Stickler, 2005).

Level 3: Dealing with Constraints and Possibilities of the Medium: At the third level, one must be able to deal with the constraints and possibilities of the medium they use. One has to make the best of a program by adapting his/her teaching materials and content to it. One also has to deal with students' expectations, for example, identifying the strengths and weaknesses of Zoom and Microsoft Teams, and knowing that Zoom can be used for discussion activities via breakout rooms (Hampel & Stickler, 2005).

Level 4: Online Socialization: At the fourth level, one must create a sense of community in the classroom. It involves online protocols or netiquette rules that students need to follow, for example, turning on cameras when entering the Zoom room, showing facial expressions or non-verbal language through online conference-based software (Hampel & Stickler, 2005).

Level 5: Facilitating Communicative Competence: At the fifth level, one must be able to encourage learners to communicate and socialize as a group. This can be achieved through a task, assignment design, and teacher-facilitation, such as assigning students to work in groups in breakout rooms or assigning writing group work via Google Docs (Hampel & Stickler, 2005).

Level 6: Creativity and Choice: One must be able to select appropriate content for their students from available online resources. One can be creative by customizing materials or tasks to their classroom contexts as well as designing their own online activities, for example, by creating online teaching materials that are interactive or integrating technological tools/applications into classroom lessons (Hampel & Stickler, 2005).

Level 7: Creating Their Own Style: One must create their own teaching style, maximize the use of media and materials, build up a rapport with their students, and use resources creatively to promote active and communicative language learning, for example, by having empathy with students focusing on both emotional and academic aspects when teaching online and building up a good rapport so that students trust their teachers when studying online (Hampel & Stickler, 2005).

Figure 1 Skills pyramid by Hampel and Stickler (2005) as cited in Compton (2009)

Compton (2009) proposed an adapted model for online language teachers, as she recommended that the skills need not have to be developed sequentially based on Skills Pyramid by Hampel and Stickler (2005). Instead, Compton (2009) suggested that teachers' skills regarding technology, pedagogy, and it can be developed synchronously.

According to Compton's (2009) model, the seven skills from the skills pyramid by Hampel and Stickler (2005) can be organized into three levels of expertise (novice, proficient, and expert), based on three aspects of teaching (technology, pedagogy, and evaluation). The skills within each level can be developed individually or simultaneously, but it is necessary to achieve the essential skills in order to proceed to the next level of expertise (Compton, 2009). For instance, any skills listed in any of the three sets (technology, pedagogy, and evaluation) under the novice level can be developed in any order and combination. However, these skills have to be developed before an individual can proceed to the skills at the proficient level (Compton, 2009). The model shows only the main skills for online language teachers, but other skills, such as discipline skills and emotional interactions skills (Nussbaum, 1992) can be added later from further studies.

In conjunction with the skills proposed by Compton (2009), the ability to substitute, augment, modify, and redefine technology into teaching is implied in the skill sets (Hamilton et al., 2016; Puentedura, 2006). In concordant with the proposed skills by Compton (2009), the ability to substitute, augment, modify and redefine technology into teaching is implied in the skill sets (Peuntedura, 2006; Hamilton et al., 2016). The ability entitled Substitution, Augmentation, Modification, and Redefinition or SAMR can be a part of the skills that online language teachers should have.
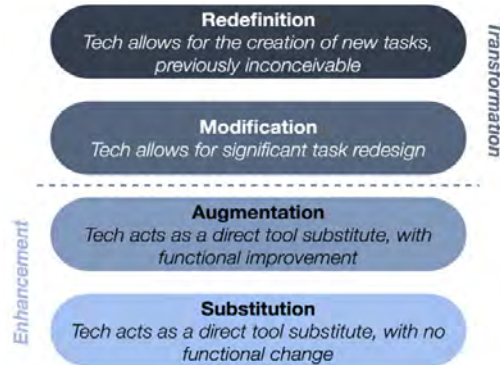
Figure 2 Puentedura's (2006) SAMR model (retrieved from http://www.hippasus.com/rrpweblog/)

Hamilton et al. (2016) clarified the SAMR model as the ability of teachers when enhancing technology in teaching. The substitution is the basic level and the redefinition is the highest level of ability. The substitution and augmentation levels can be categorized as the enhancement category, while modification and redefinition belong to a higher category, the transformation.

According to Compton's (2009) proposed model, there are three levels of expertise: novice, proficient, and expert based on three aspects of teaching (technology, pedagogy, and evaluation). Thus, to proceed to higher levels of expertise, each teacher needs to acquire the SAMR ability levels step-by-step starting from the Substitution level.
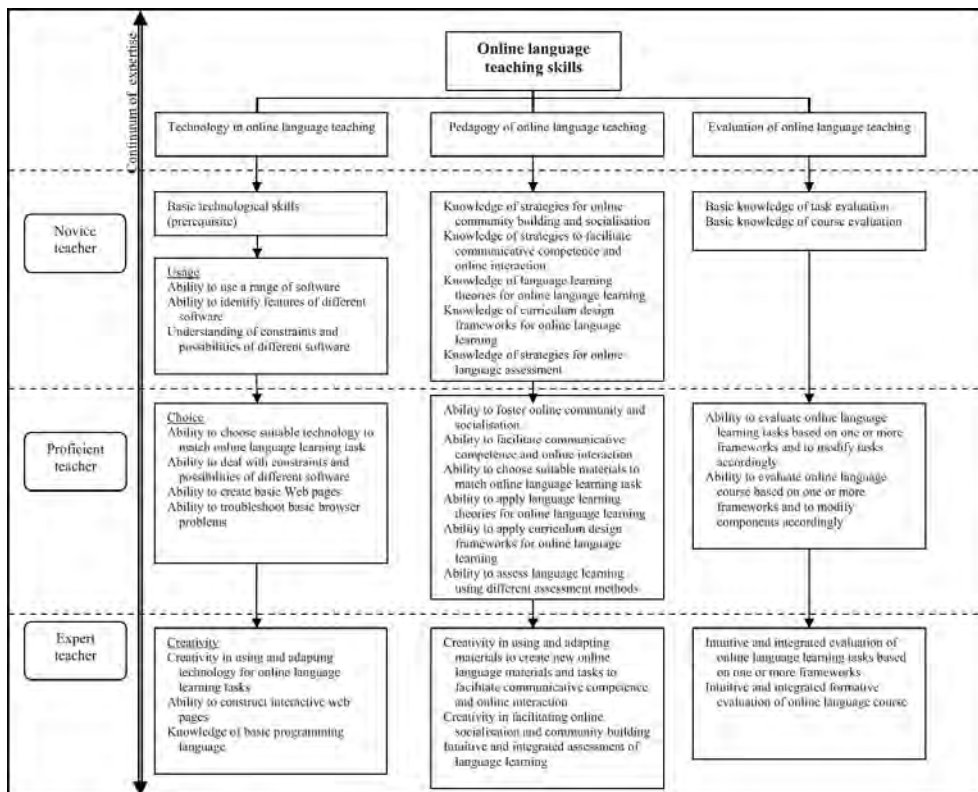

Figure 3 Proposed framework for online language teaching skills (Compton, 2009)

EMPIRICAL STUDIES

Teachers' attitudes towards online teaching

Similar to other parts of the world, Asian countries, namely China, Indonesia, and Iran implemented online teaching into their curriculum. Previous studies conducted in Asia have pointed out the challenges and difficulties when students study online (Jiang et al., 2021; Tadesse & Muluye, 2020). Some scholars have indicated that teachers have struggled to teach online (Atmojo & Nugroho, 2020; Hedayati & Marandi, 2014; Lu et al., 2020).

According to Lu et al.'s (2020) study, 354 teachers from 23 primary and secondary schools in central Guangxi, China completed the surveys and stated that the stability of network speed and the online teaching platform were the main factors that affected the teaching performance and students' learning experiences. The teachers also encountered a lack of interactions and participation from students while teaching online. Many teachers from the study struggled to adjust to teaching online at first, implying that it increased the weight of lesson preparation and psychological stress. The researchers suggested that the student's online learning ability should be enhanced. Consequently, the teachers need to find ways to enhance students' abilities.

Similar to China, Indonesian teachers from Atmojo and Nugroho's (2020) study reported that there were challenges when they taught online during the pandemic. The teachers from the study revealed that many issues arose from the students, teachers and students' parents. As a result, online learning did not function efficiently due to a lack of preparation and planning. The findings also encouraged scholars to realise that online learning requires more time than face-to-face classes. Thus, teachers must be properly trained and equipped with the necessary information and skills in order to maximize their online learning activities.

Iranian EFL teachers perceived difficulties and challenges from implementing computer-assisted language learning (CALL) in their classrooms. Hedayati and Marandi (2014) revealed that EFL teachers who completed the survey (n = 100) and interview (n = 12) regarding CALL implementation encountered difficulties (e.g., teacher technology integration competency, limited facility, and learner constraints) in technology integration in their classrooms. This study indicated that teachers' difficulties and challenges were based on how to implement CALL into classes. Consequently, teachers need to prepare themselves to have adaptability in integrating technology into their classes during online teaching.

Professional training before and during COVID-19

During 2010–2020, research papers describing new literacies and teachers' professional development have been published (Tafazoli, 2021). Digital literacy is a necessary component of teachers' survival skills in the twenty-first century, and it must be considered while enhancing the capabilities of teachers, particularly language teachers.

To facilitate teachers gaining skills and abilities in online teaching, professional training is one

of the major keys. Studies before and during the COVID-19 period (2010–2021) illustrate perceptions of teachers' needs for professional training at each point in time.

Thai teachers' need for professional training before COVID-19

Considering teachers' needs in Thai educational contexts, Khamprem and Boonmoh (2019) have clearly demonstrated that all English vocational teachers from their study would like to motivate students to learn, help students practice language skills, create a relaxing classroom environment, help in assessing student learning, increase student engagement and participation, help to check student comprehension, keep records of student learning and save time for marking quizzes or exams. The study also shows that teachers were more inclined to use technology in their classrooms if the training originated from a bottom-up rather than a top-down policy and was based on teachers' expressed needs. The study revealed that successful technology integration in classrooms was determined by the teachers' stated needs and willingness to learn, rather than their age or years of teaching experience.

In 2021, Boonmoh and Khamprem extended their study on teachers' needs. Boonmoh and Khamprem's (2021) study revealed that all 11 teachers from a private high school employed technological tools to enhance classroom learning materials. The most popular applications were Kahoot and Quizizz, as teachers indicated that these applications could stimulate and support their students' learning. There were positive perceptions towards technological training programmes before COVID-19.

Furthermore, a variety of applications were the focus of the training programmes. The teachers also implied from previous studies (e.g., Boonmoh & Khamprem, 2021; Khamprem & Boonmoh, 2019) that to make classes relax, a variety of tools and applications was the key. However, there have been some changes in the requirements for teacher training during COVID-19, which will be detailed in the next section.

Teachers' need for professional training during COVID-19

There were pieces of teacher training conducted during the COVID-19 pandemic due to the urgent need of educational administrators worldwide. Pedagogical needs were taken more into account, as teachers had needs for organizing training programmes regarding technology integration (Llerena-Izquierdo & Ayala-Carabajo, 2021; Nguyen & Kieuthi, 2020). The role of online teachers was highlighted more compared to pre-COVID training programmes. Llerena-Izquierdo and Ayala-Carabajo (2021) have clearly demonstrated that the purpose of training during the COVID-19 pandemic was to prepare teachers to design, practice and use ICT tools for online teaching and learning. The results from their study showed that the training programmes could strengthen the teachers' ability to use ICT tools and open new spaces for simultaneous communication that helped teachers begin the new online academic period positively.

New trends in technology applications in education were emphasized in Nguyen and Kieuthi's (2020) study. The researchers highlighted the shifting role and capacity of university lecturers

to adapt to the trends during the pandemic. The ability to apply information technology in teaching was marked as a necessary competency for teachers. By integrating digital literacies into teachers' development training, non-traditional methods of education were hoped to promote better learners' learning experiences.

Regardless of the time period (before or during COVID-19), there were numerous workshops regarding online teaching (Boonmoh & Khamprem, 2021; Khamprem & Boonmoh, 2019; Llerena-Izquierdo & Ayala-Carabajo, 2021; Nguyen & Kieuthi, 2020). However, the teachers' needs were not fully implemented into the training workshops in order to cover all the skill sets or abilities, according to the proposed models of Compton (2009), and Hampel and Stickler (2005). Furthermore, the training workshops were not adequately designed based on the teachers' needs as it did not provide teachers with the skill sets they required. Thus, this research aimed to seek ways to discover teachers' needs for their professional development according to the proposed models for online language teaching. The implications of the research would be guidance for future teacher training regarding online language teachers' skills.

METHODOLOGY

Research design

The current study used a mixed-methods methodology to investigate the experience, problems, and professional development needs of Thai EFL university teachers, allowing the researchers to approach such perspectives from a triangulated standpoint. A mixed-method design was used to address the research outcomes, as quantitative and qualitative data can help each other in explaining the phenomenon being studied (Creswell and Plano, 2011). First, an online survey was used to collect 120 teachers' responses. This was followed by more in-depth questioning about the responses through the use of semi-structured interviews. The primary goal of the study was to investigate these teachers' views of their future professional development courses.

Participants

The participants of this study were 120 Thai tertiary teachers of English from 52 institutions and universities across Thailand who had taught English subjects in the past three months. The 120 teachers were those who responded to an online survey on 'Integration of Technology During the COVID-19 Pandemic'. The respondents were contacted by using a snowball sampling technique. They were assured of their confidentiality and anonymity and that they had the right to withdraw from participation at any time. Table 1 presents the demographic profile of the 120 respondents.

Table 1
Demographic profile of the respondents

	Categories	Participants (N = 120)	Percentage
Gender	Male	46	38.3%
	Female	74	61.7%
Age	20–30	17	14.2%
	31–40	64	53.3%
	41–50	34	28.3%
	51–60	3	2.5%
	More than 60	2	1.7%
Teaching experience	0–5 years	34	28.3%
	6–10 years	39	32.5%
	11–15 years	32	26.7%
	16–20 years	11	9.2%
	More than 20	4	3.3%
Experience in teaching online	Yes	108	90%
	No	12	10%

Of these 120, six participants were selected through a purposive sampling technique to participate in an online interview (see Table 2). These six teachers were selected for the interview because they indicated an interest in participating in further interviews and provided contact information in the survey. Additionally, each of them is a teacher of a different university representing a different region of Thailand.

Table 2
Demographic profile of the interviewees

Pseudonym	Age	Teaching Experience	Highest degree
Anon (M)	29	4	Master's degree
Lalita (F)	33	7	Master's degree
Arthit (M)	37	7	Doctoral degree
Nantana (F)	42	10	Doctoral degree
Sunisa (F)	47	15	Doctoral degree
Sukanya (F)	51	22	Master's degree

Instruments

For the survey, an online questionnaire was used to elicit information on the teachers' experience of their use of technology, the challenges of their technology use and their needs for future development courses. The questionnaire consisted of 18 items that were divided into five main parts: the teacher's background, experience in online teaching, challenges in online teaching,

needs for future professional development courses and contact details. Following the creation of the survey, it was piloted with three instructors. Changes were made to the questions to increase their clarity and alignment with the research questions. While the survey was the primary instrument used in this study, data triangulation was accomplished via a semi-structured interview with six teachers. The semi-structured interview was used to elicit the participants' experience in their online teaching classes, with a particular emphasis on their needs for future development courses. The interview questions were designed based on the research questions, and they were open-ended so that the researchers could ask follow-up questions in order to further explore the details of the answers provided. Consent forms were given to the participants before the interviews were conducted. They were informed that they were free to participate in this study or to withdraw at any time. In order for them to speak freely, they were interviewed in an individual session in their first language (Thai).

Research procedure

First, survey questions were developed, piloted, and revised. The survey was then distributed online between May 1 and 15, 2021. Following an initial review of the survey results, participants who showed an interest in participating in a follow-up interview and supplied contact information were contacted. Individual semi-structured interviews were conducted to collect data in order to clarify further information from the survey. Each participant was interviewed individually by telephone or teleconference tool (ZOOM) and was requested to sign an informed consent form before participating. They were interviewed individually for approximately 15-20 minutes between May 26 and 28, 2021.

Data analysis

The responses from the online survey were analyzed through the use of frequency counts and percentages. The participants' answers were also listed and categorized into themes to address three aspects: experience in, challenges of and needs for future online teaching.   For the semi-structured interview, the participants' responses were transcribed. The data were analyzed using Hampel and Stickler's (2005) Pyramid of Skills Framework and Braun and Clarke's Framework of Thematic Analysis (2006). To align with the thematic analysis, we prepared the data for analysis first. The data were presented in numbers from questionnaires and transcripts from interviews. Then we became acquainted with the data by reading through the data to gain a general sense of the information and an opportunity to reflect on its overall meaning (Braun & Clarke, 2006; Creswell & Creswell, 2017). The next major step is coding and generating themes. The coding process is the process of breaking down segments of text data into smaller units, and then examining, comparing, conceptualising and categorizing the data (Rossman & Rallis, 2012). The coding guided us in generating descriptions and themes (Braun & Clarke, 2006; Creswell & Creswell, 2017). Then we interrelated the data with theoretical aspects e.g., SAMR, the skills pyramid by Hampel and Stickler (2005), and Proposed Framework for Online Language Teaching Skills (Compton, 2009). Finally, we reviewed the themes and their descriptions and finally presented the data in a scholarly report (Braun & Clarke, 2006). The keywords from their responses were collected and presented in a narrative quotation form. One set of interview transcripts was sent to an external coder to verify the reliability of the analysis.

FINDINGS

The purpose of this study was to explore the experiences and challenges of EFL instructors at Thai universities who taught in emergency online settings, as well as their future professional development needs.

Survey findings

The data from the survey were categorized into themes based on teachers' responses. The following are the themes:

- Support from the university, online platforms and applications used by the participants
- Challenges encountered by the participants in the online teaching
- Needs for professional development

Table 3 displays the teachers' perceptions towards support from their organisations and their use of online platforms and applications during COVID-19.

Table 3
Support from the university, online platforms and applications used by the participants

Categories	Description	Frequency	Percentage
Support from your institution	Using university email address to gain access to different tools/ programs	106	88.3 %
	Providing training workshops on basic ICT skills	91	75.8%
	Providing training workshops on new learning tools/ applications	62	51.7%
	Providing technical assistance (Helpdesk)	32	26.7%
	Loaning laptops, notebooks to support you in teaching from home	26	21.7%
	Loaning webcams	21	17.5%
Platforms you used to teach	Zoom	87	72.5%
	Google Meet	71	59.2%
	Microsoft Team	45	37.5%
	Line Video Call	30	25%
	Facebook Live	10	8.3%
	Messenger Video Call	4	3.3%
	Skype	3	2.5%
	Webex	2	1.7%
Applications you often use in teaching	Microsoft Word	100	83.3%
	Microsoft PowerPoint	82	68.3%
	Canva	69	57.5%
	Google Form	66	55%
Applications you never use	YouTube	87	72.5%
	Kahoot!	78	65%
	Quizizz	75	62.5%
	Mentimeter	65	54.2%

Overall, the participants stated that the main support they received from the organizations was related to basic ICT programs/skills. One hundred six participants stated that the university provided email addresses to gain access to different tools/ programs. Participants reported that equipment assistance was offered to a lower extent than basic ICT skills help (91 participants) and support on new technical tools or applications (62 participants). Only 32 participants responded that their universities provided Helpdesk, a service providing information and support to computer users, as a part of the teachers' technical assistance. Similarly, university policies for loaning laptops, notebooks, and webcams were mentioned by only 26 participants.

In terms of platforms used, they are classified according to their functions. Zoom, Google Meet, and Microsoft Teams were often used among participants because they were mainly designed for online conferencing. Online social media platforms such as Line Video Call, Facebook Live, and Messenger Video Call, on the other hand, were used less often than online conference-based tools. Notable is the latter, which has been popular in Thailand from the pre-COVID-19 era. As a result, the teachers were already familiar with the use of these platforms in the classroom.

In terms of frequently used applications, participants indicated that they relied heavily on Microsoft Office products such as Word and PowerPoint. Similar to PowerPoint, Canva, a graphic design platform for creating graphics, presentations, posters, papers, and other visual material, was ranked third as the most often used program during class. Google Forms, a survey administration tool, is the least used program, according to surveys. Finally, when asked about their non-used applications, participants most often stated YouTube, Kahoot!, Quizizz, and Mentimeter.

Table 4 shows the challenges encountered by participants in online teaching.

Table 4
Challenges encountered by participants in online teaching

Categories	Frequency	Percentage
Students not turning on their camera	103	85.8%
Students not being engaged in the classroom	101	84.2%
No interaction between students and teacher or students and students	96	80%
How to create interesting lessons or activities	85	70.8%
Assigning students to work in pairs or groups	62	51.7%
Reliability and transparency of online classroom test	37	30.8%
Teachers not being familiar with platform/applications	24	20%
Stability of the internet connection	23	19.2%
How to check student attendance	17	14.2%
Receiving an assignment from students	16	13.3%
Providing feedback to students	12	10%

As shown in Table 4, the top three most difficult issues associated with online teaching were classroom interactions in which students did not turn on their video cameras (85.8 %), difficulty engaging students in online learning (84.2%), and a lack of interaction between the teacher and students and between students themselves (80%). The distinction between engagement and interaction is that engagement entails maintaining students' attention during class, whereas interaction entails cooperating with or communicating with other students or the teacher.

The following two most significant issues are associated mainly with students' engagement and interactions. As a result, almost 70.8 percent of participants voiced worry about how to make their lectures more engaging, while more than half (51.7 percent) felt difficulty assigning students to work in pairs or groups in such an online environment.

Twenty-four participants (20%) reported not being familiar with the teaching and learning platforms while 23 participants (19.2%) reported having problems with the internet connection. The least reported challenging issues were related to students' evaluation and assessment, which are checking students' attendance, receiving an assignment from students, and giving feedback to students.

Table 5 represents the needs for professional development.

Table 5
Needs for professional development

Workshops on	Frequency	Percentage
Motivating students and increasing engagement	98	81.7%
Online language teaching skills	91	75.8%
Integrating application in teaching and learning	90	75%
Promoting group interaction and collaboration	79	65.8%
Creating online learning activities	66	55%
Online assessment	58	48.3%
New applications for teaching and learning	45	37.5%
Learning and sharing on technology use	38	31.7%
Basic ICT skills	24	20%

Table 5 represents the needs for professional development. The findings in Table 5 are obviously linked with the findings in Table 4 because engagement, interactions, and interactive lessons are considered as challenges in online teaching. When asked about their needs, the participants said that they require workshops on encouraging students and enhancing engagement, as well as workshops on online language teaching abilities. With regards to lesson design, the participants addressed that they need workshops on integrating application in teaching and learning, promoting group interaction and collaboration, and creating online learning activities. The least mentioned needs were related to basic ICT skills. It can be concluded that the participants thought that they had adequate knowledge of basic ICT skills.

Interview findings

The data from the interviews were divided into topics based on teachers' expressed needs for professional development courses. Their expressed needs were then classified using Hampel and Stickler's seven-tiered skill pyramid (2005).

According to the analysis, all six participants did not require basic ICT skills (Level 1), since no one cited basic ICT skills as a part of their needs. This is self-evident because all of the participants have prior experience teaching online and should at the very least be proficient at this level.

Only one participant, Sukanya, stated that she requires particular software technical skills (Level 2) since she has a real and urgent need to learn more about them. Despite the fact that Sukanya was the oldest of the six participants, her motivation for wanting to learn more about new apps and technologies was justified, as there was no practical need for online teaching in her job environment, as the interview excerpt demonstrates.

> *Last year [2020], my classes were not 100% online. Since my university is not located in Bangkok and the number of COVID-19 cases in my province was not high, we taught online for just only a month and then we taught face-to-face as usual. But this year, the situation is getting worse; all classes must be online. I am not prepared for it.*
>
> *I heard my (younger) colleagues mention application tools like Kahoot! or Mentimeter, but I never used them before. So, I think having a workshop on introducing new technological applications will be a good idea for me too.*

This may demonstrate that Sukanya had no intrinsic need in her situation. In other words, the COVID-19 pandemic had an external effect on her needs. If she had been permitted to teach in onsite classrooms during the pandemic, she would not have integrated technology tools into her courses.

Except for Arthit, five participants expressed a need for the future professional development course to incorporate abilities in coping with the constraints and opportunities of technology tools (Level 3). According to the interview, teachers have been exposed to new technology tools or have attended multiple workshops on the introduction of new technology tools, indicating that they are quite competent. However, these teachers stated that rather than learning new technologies, it would be more advantageous if they could improve their use of existing tools.

> *I think it is not really about the tools, but it is about what the tools can offer. For example, I use Microsoft Teams as a platform for teaching. At first, I didn't know how to check attendance or how to download the report. And recently, I just found out that I can put students into smaller groups using the 'breakout room' function. Well, it's either they (Microsoft Teams) had this feature and I didn't know about it or they just added this feature. So for me, a future professional development course will be about how to make the best use of the existing tools.*
>
> Excerpt from Arnon's interview

I did not know many features of Zoom. I just learned how to schedule a meeting in Zoom a few weeks ago. Also, I just learned that I could use the "annotation tools and breakout room" in Zoom. I think if I know how to use these features, I will be confident and can make the class more interactive. So, I think that if there is to be a workshop, I think I need a workshop that can explain what features in Zoom or other platforms like Google Meet or Microsoft Teams are, how to use those features and in what situations.

Excerpt from Sukanya's interview

Some interview extracts from participants may suggest that in order to teach online, one must not only understand the many types of tools accessible, but also how to fully utilize all of the capabilities available in each tool.

The next stage of preparation required for online teaching is online socialization (Level 4). Participants who expressed worry about this were concerned about the manner in which communication occurs during the actual online classes as well as the factors that contribute to good communication. When teaching is conducted regularly in a face-to-face setting, the teacher and students share the same environment, allowing them to see both spoken and nonverbal communications. Teachers may use all of their teaching skills to ensure that classes go smoothly, including asking questions, checking students' comprehension, assigning students to work in groups, providing feedback, and analyzing and responding to students' input. However, while teaching online, these teachers said that they still need all of these skills but have a better understanding of how to use them in an online context. Excerpts from Anon, and Arthit clearly support the above points.

In a classroom setting, you can walk around, you can see if students are paying attention or they are doing some other things, you can monitor the students easily, you can talk to the students. But for online teaching, I think the online teaching skills are very important. I don't know if they just wake up or they are not ready to learn. I don't see their reactions their facial expressions. So think what I need for the future profession development course is about the skills or techniques for teaching online. It can be something like how check their understanding, how to give clear instructions, how to create an opportunity for them to discuss or to interact with each other… well I mean the same teaching techniques like we teach in classrooms… but just how to do them online.

Excerpt from Arnon's interview

So, the future workshop can focus on ways to increase their awareness of successful communication, how to react, or respond in online settings, the importance of turning on cameras, or writing us back on the chat, or using annotation tools, using emoticons. Instead of the teachers always saying that they should turn on the camera, they should not be silent. The training can include a list of activities that can help the students see the value of interaction… you know… of communication.

Excerpt from Arthit's interview

Arthit continued to emphasize the necessity of having a positive classroom environment that encourages students to communicate with one another as well as offering genuine opportunities for them to speak and work in pairs or groups. This set of requirements can be classified as Level 5: Facilitating communicative skills.

> *I think the class is dynamic when students enjoy talking to each other. In a normal classroom setting, students don't only come to university to learn but they meet their friends they talk they laugh they work together. I tried to motivate my students. So I think the future professional workshop should be related to how to increase interaction, how to create good online atmosphere, how to increase teamwork and collaboration.*

Apart from these needs, participants stated that future workshops should cover not only how to use all of the functions of a technological tool, but also how one technological tool can be used for a variety of different teaching purposes or which tool is better suited to teaching specific language skills. The training should inspire teachers to think creatively about how to design various online learning activities. These participants' stated needs are categorized as Level 6: Creativity and Choice.

> *"The future professional development workshop should be specific, something like the skills for teaching online, the ways teachers can incorporate technology (tools) for specific language skills like for speaking, writing, or reading. For example, I find it difficult to teach a writing class online. Or maybe having a trainer to train or to share the experience of how to use the applications in various teaching steps, what works, what didn't work or tips to avoid like do's and don't(s) will be a good idea."*
>
> Excerpt from Nantana's interview

> *I think I am quite competent with technology, so I only attended one workshop about technological applications. I knew a lot of new technological applications. It's good to know, but I want to know more about how I can use them in different situations. For me, "…being able to integrate one technological tool in different stages of teaching" is more important than just knowing a great number of tools.*
>
> Excerpt from Lilita's interview

Interestingly, only one participant, Nantana, expressed a desire for a profession workshop to focus on how to develop positive relationships between teachers and students, techniques for building students' trust in the teacher, and even additional psychology knowledge so that teachers can better deal with students who have psychological difficulties as a result of learning online at home.

> *But for me, the second point is more important. The second point is how to have a good relationship with the students. How to make them feel trust in you or how to show them that you care… you know. How to keep their well-being and good mental health. Well, as I told you, COVID-19 hit us very hard. And it changes everything. I have some students whose parents lost their jobs or are very sick from COVID-19. For a situation like this, apart from training how teachers make use of the tools, how to*

integrate technology, I think training should be something that can keep students motivated… how they can have fun and laugh. Maybe, including basic psychology courses for teachers like how to handle students who have problems … can be helpful.
Excerpt from Nantana's interview

Again, basic ICT skills were not required of teachers. They expressed a range of needs, based on their prior experience with and exposure to technology. Each teacher exhibited characteristics of individuality in their claimed demands for online language teaching. Each teacher showed the traits of individual differences in their stated needs regarding online language teaching.

DISCUSSION AND CONCLUSION

The findings from the survey showed a broad general view of what higher education teachers need to utilize particular online tools to customize their own activities and tasks as well as increase students' engagement and interactions. Overall, the actual stated use of technology, challenges, needs, and beliefs regarding technology integration from the survey were interconnected. In other words, the teachers had encountered a lack of interactions and engagement in online classes, so they did not need too many applications or tools to teach online. However, they need some teaching techniques to be able to apply their pedagogical knowledge with the use of particular technological tools or applications with which they are familiar with. From the survey results, teachers used technology in accordance with two main models, namely the skills pyramid by Hampel and Stickler (2005) and Proposed Framework for Online Language Teaching Skills (Compton, 2009).

Similar to the survey's results, during the interviews, the participants stated their needs regarding online language teaching skills based on the skills pyramid by Hampel and Stickler (2005). According to the analyzed findings, all six participants had experiences in online teaching and their prior technology knowledge. Consequently, the most often-mentioned need was dealing with the constraints and possibilities of the medium. Therefore, it is not surprising that they expected to make the best use of the applications/tools by adapting their teaching materials and content to the technological medium (e.g., Kahoot!, and Quizzizz). There was one participant who requires particular software technical skills since intrinsic motivation has played an important role in urging teachers to learn and use technological tools. In other words, teachers' intrinsic motivation, which is defined as behaviour motivated by internal rewards (Dörnyei, 1994) drives them to use or not use technology in their classes.

Overall, the findings were consistent with previous studies (Boonmoh & Khamprem, 2021; Khamprem & Boonmoh, 2019) in that future teachers' training should originate from teachers' stated needs rather than focusing on just including new applications and tools. In addition, future teacher training is required to highlight ways to broaden the ability to apply information technology in teaching because university lecturers desire to change their roles and capacities to fit the trends of the technology era (Nguyen & Kieuthi, 2020).

With regards to pedagogy, apart from the skills pyramid model, Compton's (2009) proposed

framework for online language teaching skills (see Figure 3) was taken into account because the participants from this current study mentioned pedagogy, technology and evaluation while being interviewed. The teachers from this study barely mentioned evaluation and assessment of online language learning. However, they stated their need regarding the pedagogy of online language teaching, especially as a means to increase students' interactions and engagement in classrooms. The findings are concordant with Compton's (2009) study in a way that teachers need to have all three skillsets, namely pedagogy, technology and evaluation synchronously while teaching online.

For the challenges of online language teaching, the results from this study were not consistent with the results of some previous studies regarding limited facilities in classes (Boonmoh et al., 2021; Nim Park & Son, 2009), which stated that the insufficiency of facilities could affect the use of technology in the classroom. In contrast, only about 19% of the participants in this study reported having problems with facilities. In particular, the findings of this study were not in line with Boonmoh et al.'s (2021) study in that there was a mismatch between the challenges of higher education lecturers and secondary lecturers. The 126 Thai secondary teachers in Boonmoh et al.'s (2021) study reported that one main barrier to technology integration in classrooms was the insufficiency of facilities, such as computers and the internet. It can be inferred that Thai teachers in different levels of education (elementary, secondary and tertiary levels) encountered problems in different dimensions. Taking a look at the Thai educational support system, the Office of the Basic Education Commission of Thailand has funded primary and secondary schools in Thailand based on their sizes (Office of the Teacher Civil Service and Educational Personnel Commission, 2011). Thus, several schools in Thailand have not been adequately supported in terms of facilities. In contrast with Thai schools, the facilities of universities in Thailand were readily available even before COVID-19, especially in rural contexts, or small schools contexts (Buaraphan, 2013; Kantabura & Tang, 2006).

According to the findings, teachers' needs were thematized based on skills pyramid by Hampel and Stickler (2005) and Proposed Framework for Online Language Teaching Skills (Compton, 2009). Thus, a professional learning community (PLC) should be implemented by the administrators of each university. Regarding future professional development training for higher education teachers, administrators and educators need to focus on existing applications and tools that the teachers are using and with which they are familiar rather than introducing new tools and applications. Making the best use of existing applications should be taken into account to save time and costs allocated by the organizers. More importantly, future training should be organized to serve the teachers' actual needs. Thus, the key concepts underlying the objectives of each teacher training would be in line with the concepts of individual differences and precision language education (Lian & Sangarun, 2017).

Furthermore, future training should be focused not only on basic knowledge of technology, but on more advanced level of competency, such as approaches for online language teachers to use technological tools/applications to show empathy or mutual understanding to their students during challenging times, such as a dreadful outbreak (e.g., COVID-19) or deadly natural disasters. By showing empathy to students via online platforms, the teachers will be able to build a deep rapport with students when teaching online. As a result, the students will

be able to trust teachers and learn with less anxiety. Online learning during the global COVID-19 pandemic has negatively affected the mental health and well-being of students (e.g., Jiang et al., 2021; Tadesse & Muluye, 2020). To reduce students' anxiety during school closures, teachers should learn how to express their deep empathy to their students via an online medium.

With regards pedagogical implications, administrators should consider adding lessons on how to teach online in teacher education programmes. Thus, student teachers will be able to acquire skills for online language teachers to teach effectively. With regards to students, there should be a training program that teaches new students how to communicate effectively while studying online. Thus, online classroom etiquette introduction should begin at the start of the term. Teachers should be responsible for advising students on how to convey messages by using different communication strategies via online platforms, such as using emojis, stickers or annotate functions when studying, unmuting their microphones when being asked by teachers and using emoticons when interacting with friends and teachers.

In terms of the study's limitations, this research relied on in-depth interviews with only six participants from a large-scale sample (120 EFL teachers from 52 universities across Thailand). Therefore, the results may not be suitable to generalize to all Thai higher education teachers that differ to a greater degree in their use, need and perception of technology. For further studies, the researchers want to investigate teachers' integration of technology during the COVID-19 pandemic by using in-depth interviews and classroom observations with larger scale samples. By doing so, the results may be more suitable to generalize to Thai higher education lecturers.

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Appendix 1

Survey form (on Google form)

Integration of technology during COVID-19 pandemic: Challenges and needs of Thai EFL teachers

This research is aiming at understanding teachers' experiences of technology integration during the COVID-19 pandemic. It also explores challenges and needs of teachers in EFL classrooms. All responses will be treated confidentially. If you require more information, please feel free to contact me at: Email: atipat.boo@kmutt.ac.th, thidaporn.j@sut.ac.th, titirut.r@litu.tu.ac.th, or sawitree.sae@kmutt.ac.th

1) Gender: Male/Female

2) Age: __ 20-30   __ 31-40   __ 41-50

                                        __ 51-60   __ more than 60 years old

3) Years of teaching experience: _____

4) Affiliation: _____

5) Have you ever taught online prior to the spread of the COVID-19 pandemic?   Yes/No

6) Have you taught an English class online over the last six months?   Yes/No

7) Which platforms for teaching and learning did you use in the previous semester? You may tick multiple items.

         __ Zoom   __ Google Meet   __ Microsoft Team

         __ Facebook Live   __ Line Video Call   __ Messenger Video Call

         __ Other (s) please specify

8) Which platforms were you encouraged to use by your university?

9) Please identify the support you receive from your university to ensure the class runs smoothly.

         __ using university email address to gain access to different tools/ programs

         __ providing training workshops on basic ICT skills

         __ providing training workshops on new learning tools/ applications

         __ providing technical assistance (Helpdesk)

         __ loaning laptops, notebooks to support you in teaching from home

         __ loaning webcams

10) How frequently did you use the following web applications during the previous semester when teaching English subjects?

	Never	1-4 times	5-7 times	More than 7 times
YouTube				
Kahoot!				
Quizizz				
Mentimeter				
Google Drive				
Google Form				
Canvas				
Microsoft PowerPoint				
TED, TEDTalk				
Microsoft Word				

11) Apart from those mentioned in question 10, which additional applications did you use and how frequently when teaching online?

12) What challenges did you have when teaching English online?
 __ students not turning on their camera
 __ students not being engaged in the classroom
 __ no interaction between students and teacher or students and students
 __ how to create interesting lessons or activities
 __ assigning students to work in pairs or groups
 __ reliability and transparency of online classroom
 __ teachers not being familiar with platform/applications
 __ stability of the internet connection
 __ how to check student attendance
 __ receiving an assignment from students
 __ providing feedback to students

13) Apart from those mentioned in question 12, what additional difficulties did you have when teaching online?

14) Which of the following trainings or workshops do you need in order to teach effectively online during the COVID-19 pandemic? Having a training or workshop on
 __ Motivating students and increasing engagement
 __ Online language teaching skills
 __ Integrating application in teaching and learning
 __ Promoting group interaction and collaboration
 __ Creating online learning activities
 __ Online assessment
 __ New applications for teaching and learning
 __ Learning and sharing on technology use
 __ Basic ICT skills

15) Apart from those mentioned in question 14, what additional trainings or workshops do you need?

16) Are you available for a follow-up interview?

17) If yes, please provide your email address.

18) And your mobile phone number.

Appendix 2

Semi-structured interview questions

1. Describe your online English teaching experience in the context of your university.
2. Share your experience in teaching students online during the COVID-19 pandemic.
3. Please discuss the difficulties you encountered when teaching online.
4. If professional development courses are to be conducted, which courses do you need to help you teaching English more effectively online?
5. Could you outline what these course would entail?