

## EFL Teachers' ICT Literacy Acquisition to Online Instruction during COVID-19

Thebporn Kanchai

Thebporn.kan@msu.ac.th, Faculty of Humanities and Social Sciences,  
Mahasarakham University, Thailand

### APA Citation:

Kanchai, T. (2021). EFL teachers' ICT literacy acquisition to online instruction during COVID-19. *LEARN Journal: Language Education and Acquisition Research Network*, 14(2), 282-312.

Received  
02/04/2021

Received in  
revised form  
01/06/2021

Accepted  
18/06/2021

### Keywords

EFL learning,  
online EFL  
teaching, ICT  
literacy  
acquisition,  
language  
teaching in  
Thailand, COVID-  
19

### Abstract

Due to the global COVID-19 pandemic, educational systems, including teaching a foreign language, have been interrupted and classroom-based teaching paradigms have rapidly shifted to online platforms. Despite the emphasis of technology in language education, Thai tertiary educators are now in urgent need of identifying the best pedagogical approaches to foster this abrupt change in teaching platform. This study investigated how English as a foreign language (EFL) teachers acquired information and communication technology (ICT) literacy for online class delivery. Using a qualitative inquiry, the study employed an in-depth interview to gather data from three Thai EFL university teachers from three different north-eastern government universities in Thailand. The thematic analysis revealed that the acquisition of ICT literacy included three stages – before, during, and post-online teaching. Specifically, EFL teachers acquired ICT literacy through self-exposure to existing tutorials, peer-to-peer learning, student-to-teacher collaboration, ongoing teaching practice, expert-to-teacher learning, and engagement in formal workshops. EFL teachers also raised the issue of confidence

	in using technology and future integration of technology in a classroom-based paradigm. Pedagogical implications for other contexts encountering similar challenges are also discussed.
--	---

## 1. Introduction

Since late 2019, the novel Coronavirus (COVID-19) has severely impacted people's lives and caused worldwide devastation. The World Health Organisation (WHO) reported that the confirmed cases have globally reached beyond 44 million and the death toll has increased to 1.1 million worldwide (WHO, 2020). The governments of many countries, including Thailand, have tried to minimise the severe consequences of this epidemic by activating emergency responses and enacting various precautionary measures that include self-quarantine and physical distancing as the new normal. Education has also been greatly impacted as countries attempt to minimise chances of infection and transmission among students at all education levels (Bangkok Post, 2020). Educational institutions, schools, and universities were shut down, and classroom-based instruction was shifted to online teaching and learning. This meant that teachers needed to abruptly adapt and equip themselves with ICT literacy to conduct online lessons. Language teachers were therefore forced to alter their traditionally proposed lessons to fit this new online platform. Indeed, the beliefs language teachers hold about teaching and learning are often dissimilar to the beliefs and skills required to perform in an online teaching and learning environment. In addition, online teaching also involves distinct student reactions, teacher-and-student relationships, classroom dynamics and management, learning and teaching activities, and teaching approaches. Hence, teachers must significantly shift their teaching approaches for online classrooms.

In an EFL context like Thailand, English language teachers have faced challenges in integrating technology into their language classes (Ruangrong et al., 2014), which have been worsened by teachers' insufficient knowledge of ICT (Nomnian & Arphattanon, 2016). Indeed, language teachers require rudimental ICT-related skills to conduct their online deliveries (Inpeng & Nomnian, 2020) and, even prior to COVID-19, teachers experienced difficulties with educational technology, including a lack of hardware and software or the inability to effectively incorporate technology with pedagogical practice (Jinda & Bangthamai, 2016). When

the COVID outbreak occurred and schools shut down, the shift from traditional-face-to-face teaching to online platforms was extremely sudden. The current study investigates how EFL teachers acquired the ICT knowledge and skills to cope with this abrupt change in their teaching instruction.

Specifically, the present study was designed to investigate Thai EFL university teachers' acquisition of ICT literacy for online teaching during the COVID-19 pandemic. While some studies have begun to examine how EFL university teachers coped with their online teaching (Fu & Zhou, 2020), no studies have been conducted in a Thai EFL context. The results of this study are expected to increase our understanding of how Thai EFL university teachers acquired ICT literacy to deliver effective online classes, which may assist teachers in other contexts.

## 2. Literature Review

### 2.1 Online Language Instruction

Technological advancements have increased the number of online resources and brought numerous benefits and inevitable constraints to language teaching. There is evidence that studying in an online mode engages students' learning, resulting in increased motivation and a student-centred approach (Chapelle, 2005). Language instruction has also been complimented by electronic devices, namely smartphones and tablets, which allow learners to go beyond the time and space limitations of the classroom and make language learning more enjoyable and interactive (Demouy et al., 2016). Indeed, mobile phones are convenient tools for teachers and can make teaching more effective (Evans, 2008; Liu et al., 2008). Given these benefits, mobile learning and teaching should be integrated into an EFL teaching context to encourage learner autonomy. Moreover, it has been argued that online language instruction is similar to on-site teaching in terms of students' academic outcomes (Magagula & Ngwenya, 2004) and satisfaction (Palmer, 2012). However, there are also some constraints related to teaching in an online mode including accessibility to the teaching and learning materials (Bates, 2005; Brown, 1997). Family matters and commitments as well as individual limitations, including age, are also factors that play a greater role in online versus on-

site teaching (Bailey et al., 2014; Johnson, 2015). Indeed, online teaching demands a more flexible and needs-oriented instruction.

Online instruction requires language teachers to have pedagogical knowledge and competencies related to ICT literacy. Online course and material development is complex and requires an extensive and careful planning process as well as technology integration to best facilitate individual differences, difference in schedules, other life commitments and educational assessment (e.g., Rovai, 2003; Grant & Thornton, 2007; Rovai & Downey, 2010). To deliver an online instruction effectively, a more flexible teaching method is needed (Bawane & Spector, 2009). There are several distinctions between the online and on-site teaching environments that necessitate the development of specific online teaching competencies (Roddy et al. 2017). Indeed, the teaching and learning modes in online instruction differ from those in on-site teaching (Hung et al., 2010) and rely on various online tools, practices, and software, which requires a significant level of ICT competence (Volery & Lord, 2000). Thus, the rapid shift to online classes during the COVID-19 pandemic is, on one hand, pivotal to students' learning and, on the other hand, overwhelming for language teachers.

For decades, the Thai government has emphasised the integration of ICT into its education system, as evident in the national policy framework. The government has established the inter-universities data system as the core infrastructure system to distribute educational e-resources and other related materials and teaching and learning software (Sombuntham & Khlaisang, 2013). As a result, there has been a proliferation of massive open online courses (MOOC) to accompany the e-learning policy (Thammetar & Duandchinda, 2013). Moreover, online learning in Thailand was primarily developed to serve distance learning purposes to allow Thai universities to offer online degrees, which led to business expansion and reduced costs (Tananuraksakul, 2016). Online learning in Thailand has been associated with the concept of the blended-classroom, which requires language teachers to instruct students to perform online learning tasks in conjunction with classroom-based instruction, with the assumption that this approach will better promote student learning (Intrapairote & Srivihok, 2003; Simasathiansophon, 2014; Tananuraksakul, 2016).

Several studies have explored the use of the technology in promoting language skills, including vocabulary (e.g., Boonchom, 2011;

Phetchmunee, 2004; Raksasab, 2010), reading (e.g., Jansangsri, 2007; Kongkapet, 2007; Malathong, 2010), grammar (Buangam, 2010; Inchai, 2011; Manyawech, 2012), writing (Lamjuanjit, 2009; Srinut, 2005; Vichaidit, 2012), listening (Homla, 2009; Jungsatidkul, 2012; Karnjanaboon, 2012), speaking (Khotmongkhon, 2011; Singsri, 2011; Srichom, 2011), and integrated skills (Chamkam, 2011; Jaturapol, 2012; Phooprasartporn, 2012). These studies have shown that using technology as a teaching tool in a Thai EFL classroom promotes student learning in the target language. However, due to the COVID-19 pandemic, current language instruction must be conducted solely through an online mode, regardless of geographical locations. As such, technology must be prioritised and effectively utilised by language teachers, not as a specific pedagogical tool, but rather as an entire learning and teaching process. This may cause some EFL teachers to experience anxiety and difficulties in performing online pedagogical tasks if they do not possess adequate ICT literacy.

Despite the proliferation of studies confirming the benefits of technology use in EFL classrooms, most Thai EFL teachers still lack ICT literacy. The technology use in online teaching requires fundamental knowledge of each online teaching application and understanding how to use such applications to teach all skills in English through an online platform (Jinda & Bangthamai, 2016; Nomnian & Arphattananon, 2018; Ruangrong et al., 2014). As previously mentioned, to date, technology has primarily been used as a tool in blended learning and teaching to promote students' learning engagement and to increase target language exposure outside classroom. However, the COVID-19 outbreak has demanded that a complete online teaching approach be rapidly adopted, and research is required to examine how language teachers acquire ICT literacy in order to shift their teaching paradigm from classroom-based instruction to a complete online mode.

## 2.2 Teachers' ICT Literacy

The COVID-19 epidemic has caused a rapid classroom-to-online-teaching paradigm shift, which requires the integration of technology into language teaching. To effectively manage this shift, language teachers must develop their own ICT literacy in order to conduct their classes through online platforms. Indeed, classroom-based instruction is distinct

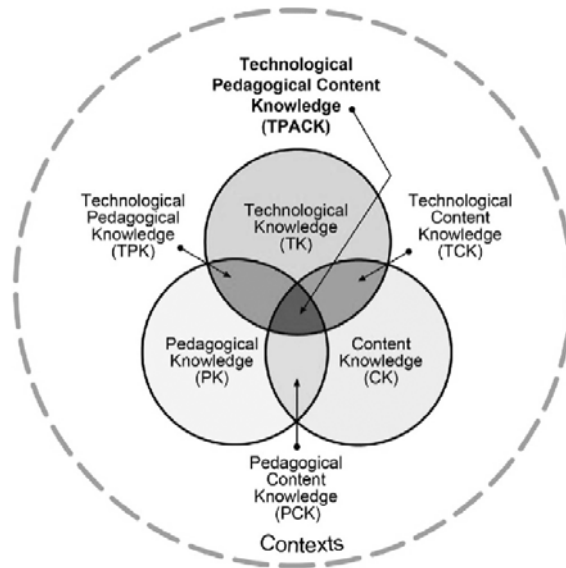
from online instruction and requires a different set of pedagogical knowledge integrated with technological knowledge. Although studying via an online mode promotes student-centeredness and self-exposure to technology (e.g., mobile learning), language learners still require supervision concerning what to use and how to use certain learning applications (Evans, 2008; Liu et al., 2008). That is, teachers are still required to assist learners in their language lessons (Bolliger & Martindale, 2004; Roddy et al., 2017) and, therefore, teachers must possess adequate ICT skills (Kukulka-Hulme, 2009) and sufficient knowledge of both technology and pedagogy (Tai et al., 2015).

The Technological and Pedagogical Content Knowledge (TPACK) model has been used to understand how language teachers acquire their ICT literacy. The TPACK model was proposed by Koehler and Mishra (2005) and was based on Shulman's (1986) model of Pedagogical Content Knowledge (PCK). The TPACK was established to draw a nexus among pedagogical knowledge (PK), content knowledge (CK), and technology knowledge (TK) within a certain pedagogical context. As illustrated in Figure 1, PK refers to how-to-teach knowledge, while CK is the subject matter of a target language (i.e., linguistics features and language devices). By contrast, TK refers to technology exploitation in teaching or facilitating pedagogic activities in the classroom with technology. Importantly, the three constructs also interact. Considering PK and CK, there is the area of Pedagogical Content Knowledge (PCK) in which language teachers execute their teaching pedagogies, approaches, and methods, to teach language contents or linguistic and discursive features of a target language. Another interaction occurs between PK and TK, which refers to Technological Pedagogical Knowledge (TPK), where language teachers can apply and even advance their teaching approaches with the use of technology to effectively deliver their lessons. Similarly, TK and PK interact to provide the construct of Technological Content Knowledge (TCK) where language teachers employ technology to assist the development and transformation of contents. Notably, there is also an interrelation among the three aspects, which is referred to as Technological Pedagogical Content Knowledge or TPACK. This interrelatedness is regarded as a core concept of the TPACK model. Despite its popularity among educational researchers

and scholars, research on the TPACK model remains limited, especially in English language teaching (Gao & Zhang, 2020).

### Figure 1

*The TPACK model (Koehler & Mishra, 2005) (Source: tpack.org)*



In a Thai EFL context, there are very few studies investigating how Thai EFL university teachers develop their ICT literacy, based on the TPACK model. In Niyomsap et al.'s (2013) study, a TPACK approach was utilised to enhance social studies teachers' competency in producing a digital courseware. The results show that applying PCK, TCK and TPK helped preservice teachers, to some extents, improve their competency levels in digital media production. Their results may not be taken to account how EFL teachers developed their ICT Literacy in delivering lessons under an online circumstance. Similarly, Kaitbanditkul and Wongwanich (2015) investigated the effects of a teacher education programme based on knowledge of instructional design and TPACK knowledge in 157 preservice teachers. A structural equation modelling analysis revealed that the "design of instructional knowledge benefited from the experience gained

through teacher-training programs and indirectly through the involvement of self-efficacy perception and TPACK framework knowledge” (p. 163). Their study, however, did not make an attempt to identify how teachers acquired knowledge of TPACK and how they applied this knowledge to classroom applications. More recently, Inpeng and Nomnian (2020) explored how Facebook was used in a TEFL programme by teacher trainers to promote pedagogical knowledge and skills related to ICT. Using a mixed methods approach, the findings revealed that preservice teachers were able to utilise Facebook to accompany their teaching; however, most teacher trainers appeared unable to use Facebook as a formal teaching platform. This indicates that improvements in ICT skills are still needed to supplement pedagogical and content knowledge.

To date, only one empirical study by Gao and Zhang (2020) has investigated how EFL university teachers cope with pedagogical challenges related to conducting online lessons due to COVID-19. Using a qualitative inquiry approach, the study revealed that language teachers agreed on the benefits, limitations and characteristics of online teaching. The in-depth interviews also revealed that language teachers in China developed their technological competences through analysing students’ needs in terms of language content and technological support, learning to teach online classes, and understanding the necessity to integrate technology to drive their online lectures (Gao & Zhang, 2020). However, the results may not generalise to the Thai EFL context where technology has not been readily adopted by educators and tertiary language teachers. Moreover, the role of online instruction in Thailand has been restricted to blended learning, rather than delivering lessons through complete online modes (Intrapairrote & Srivihok, 2003; Simasathiansophon, 2014; Tananuraksakul, 2016).

### 3. Research Methodology

This qualitative research was designed to explore Thai EFL university teachers’ acquisition of ICT literacy to conduct online lectures. The study used the constructivism theory to construct meanings from university teachers’ responses that are based on experiences, perceptions, and other thoughts. The constructivism approach views realities as



meanings that are constructed by individuals within a community based on their cultural understanding, historical background, and perspectives on society (Creswell, 2014; Denzin & Lincoln, 2011). A qualitative research design is suitable for inquiries dealing with complex, multi-layered meanings (Merriam, 1998).

### 3.1 Participants

The participants were three EFL university lecturers from three different universities in the Northeast of Thailand. All participants were Thai and had an average of 13 years in the field of English language teaching. Two of the lecturers were currently pursuing their doctoral degree in ELT at the same university and the other lecturer was a lecturer of ELT with more than 19 years of teaching experience. The participants were chosen using the convenience sampling technique (Merriam & Tisdell, 2016; Creswell, 2014). All participants were contacted via emails containing information related to the research project and a participant consent form. To protect participants' personal information, all data were kept inaccessible to the public and pseudonyms were used during the data collection period. Table 1 presents the demographics of the participants.

### 3.2 Research Instrument

An in-depth interview was used as the main research instrument to investigate EFL university teachers' acquisition of ICT literacy during the COVID-19 epidemic. The responses were collected through a semi-structured interview via Zoom and Google Meet+. Semi-structured interviews were used as they allow participants to "answer the question in any way they want and encourages them to do so in a relatively extended manner" (Borg, 2015, p. 496). Indeed, these interviews have been effectively used in many educational research studies and are considered an effective tool for in-depth investigations (Miles et al., 2014). The interview (see Appendix) was designed to gather participants' personal information using open-ended questions followed by extended questions relevant to the research question (Creswell, 2014). However, it should be noted that semi-structured interviews are time consuming (Dörnyei, 2007) and, therefore, the participants were asked to select their time of availability to avoid disturbing their online teaching.

### 3.3 Data Collection Procedures

The data were collected over a five-month period (June to November 2020). The participants were contacted via email before the data collection began and they selected their own preferred period of interviews. There were three main interviews related to ICT literacy acquisition. The first interview was conducted to explore ICT literacy acquisition during the preparation of online teaching, the second interview assessed ICT acquisition during the semester, and the final interview explored ICT literacy acquisition after online teaching. The interview length varied due to the preferred duration of the participants. During the interviews, the participants' first language (Thai) was used as it has been argued that "the relation between subjective experience and language is a two-way process; language is used to express meanings, but the other way round, language influences how meaning is constructed" (Wang et al., 2020, p.313). As such, the use of L1 in the interviews avoided language barriers and ensured a mutual understanding between the interviewer and the participants. Only the statements used in results and discussion section were translated into English. The translation work was certified by the centre for translation at Mahasarakham University, Thailand.

### 3.4 Data Analysis

The current study used Creswell's (2009) procedures to analyse the qualitative data obtained from the semi-structured interviews. The interviews were transcribed and reread carefully and extensively to ensure accuracy. After each interview, the data were analysed to explore different themes emerging from the interviews. A member-checking technique was also performed as suggested by Creswell (2014). This was conducted by returning the complete transcripts to the participants for accuracy checking before each data analysis. Three rounds of data analysis were completed due to the number of interviews, and data-triangulation was conducted at the end to assess all emerging themes.

**Table 1***Participants' Demographics and Data Collection Procedures*

Name	Gender	Age	Qualification	Univ.	Teaching Exp.	Course	Teaching Platform	Interview/Topics	Length (mins)	Date (2020)	Interview Platform
Chaiyeen	Male	43	Ph.D. (TESOL)	A	19 years	Preparatory English	Google Meet	1. Preparation for online teaching	49	July	Google Meet
								2. During-semester teaching	40	Aug	Google Meet
								3. Post-semester online teaching	40	Nov	Zoom
Thanan	Female	39	Ph.D. (ELT) (continuing)	B	13 years	Fundamental English	Zoom, Google Meet	1. Preparation for online teaching	46	July	Google Meet
								2. During-semester teaching	40	Sep	Google Meet
								3. Post-semester online teaching	40	Nov	Zoom
Bussaya	Female	39	Ph.D. (ELT) (continuing)	C	6 years	General English	Zoom, Google Meet	1. Preparation for online teaching	54	July	Google Meet
								2. During-semester teaching	42	Sep	Google Meet
								3. Post-semester online teaching	31	Nov	Google Meet

---

---

## 4. Findings and Discussion

As shown in Table 3, the ICT literacy acquisition of Thai EFL university teachers was categorised into three different stages – before, during and after online teaching. Thai EFL university teachers acquired ICT literacy before online teaching began through self-exposure to existing tutorials. During the semester of online teaching, ICT literacy was further acquired by performing college-to-college learning, student-to-teacher collaboration, expert-to-teacher learning, ongoing teaching practices based on students’ needs and more self-exposure to online tutorials. At the end of the semester, EFL teachers continued to develop their ICT literacy through participation in formal workshops offered by their university and other institutions. Teachers also reported an increase in confidence and optimistic views towards the future use of technology.

### 4.1 ICT Literacy Acquisition Before Online Teaching

Before starting online teaching, Thai EFL university teachers developed their ICT literacy via self-exposure to existing online tutorials. Specifically, Thai EFL university teachers acquired and developed their ICT skills by performing self-study to facilitate their online teaching. At the beginning of the COVID-19 pandemic, some stated that they had only a short period of time to plan and think about online teaching. They could not consult other academic colleagues as they all encountered similar hardships and difficulties in swiftly moving their classes online. As a result, language teachers needed to be autonomous and explore feasible alternatives to solve problems when turning their classroom-based instruction into online instruction. All participants also agreed that videos available on YouTube were beneficial for developing and delivering their online classes:

I did some self-studies by watching YouTube VDOs to see how people do teaching in other similar contexts. I spent such a huge amount of time watching and digesting the how-to knowledge. Due to the novel COVID-19, we cannot rely on just ourselves because we are facing the same problem and having the same challenging tasks (Thanan).

Some issues I found in my teaching are not the same as those of my fellows. This might be because we teach different

subjects and the focus of each subject differs. Some teachers teach speaking while some teach writing. I think it's better somehow to study on our feet first and solve the problems ourselves (Chaiyeon).

Skill-related subjects also require a different set of ICT literacy. As mentioned in the participants' responses, speaking and listening subjects required a certain set of technology knowledge while writing and reading required a different type of knowledge. As such, EFL language teachers may face various challenges that require extensive self-exposure and teachers need to develop certain ICT skills based on the specifications of each subject being delivered. This illustrates how the Thai EFL university teachers applied both their PK and CK to shift their class onto online platform, which suggests that the participants successfully applied the TPACK model (Koehler & Mishra, 2005).

Thai EFL university teachers further stated that, to comply with the learning management system (LMS) provided by their universities, they needed to extensively study how to use various online platforms (e.g., Google Meet+, WebEx, and Zoom) to facilitate their online teaching. It is important to note that each university uses different LMS. Indeed, each LMS platform carries different teaching and learning advantages and limitations of which language teachers need to be aware when delivering online language lessons. Some teachers also stated that:

At first, I studied a lot about how to use the teaching platforms (e.g., Google Meet+, Cisco WebEx) that the university offered. For some software, I do not know how to use it. I ended up watching tutorial VDOs from the computer centre staff (Thanan).

This statement demonstrates that, at the beginning of online teaching, Thai EFL university teachers urgently acquired ICT literacy by exposing themselves to the existing online tutorials through various online platforms. EFL university teachers also needed to be as autonomous as possible to effectively carry out their online lessons. Not only did they have to build up their TK and PCK by exposing themselves to online teaching tutorials to draw the nexus between the content and teaching with technology, they also had to cope with the demands and expectations of the institutions regarding the provided online teaching platforms. This finding confirms that the constructs on the TPACK are interrelated (Koehler & Mishra, 2005).

Another crucial reflection identified by the analysis is the insufficient integration and application of technology in Thai EFL classrooms. The participants expressed that they had been insufficiently exposed to technology use in language classrooms and that there was an unwillingness to integrate technology into their pedagogical activities, as illustrated in the excerpts below. This might have resulted from preservice-teacher education and professional development programmes that fail to address technology issues.

Every time I have to teach online I feel uncomfortable and afraid that I cannot help my students with learning problems. Even I, myself, am still struggling with how to effectively use it in my teaching (Bussaya).

During my college life, we studied a lot about technology in education, but, when it comes to real practice, it is not easy. Sometimes we felt face-threatening to ask my students to help me solve technical problems. It is also going against my roles as a teacher (Thana).

Previous studies have shown that integrating technology into pedagogic activities is not a favoured approach of Thai EFL teachers due to the predominantly used traditional teaching approach (Kanchai, 2019; Manajit, 2008). Moreover, several studies have shown that, in Thailand and similar EFL contexts, technology has not been extensively used in language classrooms (Jinda & Bangthamai, 2016; Nomnian & Arphattananon, 2018; Ruangrong et al., 2014). This indicates the need to promote TK in teacher education and other professional development programmes to upskill future teachers for 21<sup>st</sup> century teaching and learning. Moreover, adequate TK would guarantee the success of online instruction requiring technological applications.

## 4.2 ICT Literacy Acquisition During Online Teaching

The analysis indicated that Thai EFL university teachers developed their ICT literacy skills through peer-to-peer learning. At the beginning of the COVID-19 epidemic, all EFL university teachers had to move their language classes to online platforms and they were in desperate need of guidance and advice from their colleagues. All participants admitted that they sought technology-related assistance from their academic colleagues

concerning how to conduct an online class, technical preparation, and how-to knowledge in dealing with ongoing problems caused by technology. Some also stated that:

At first, I called for help from my college at the university where I work, asking what to do, which platform to use, how to teach, what to prepare and how to cope, with technical errors. I felt really overwhelmed once I knew that I needed to move my lectures online (Bussaya).

I am an old teacher who have left the teacher education programme for a big while. I needed to turn to younger colleges who have just started their teaching career to help me do the teaching during COVID-19. They helped me choose teaching platform(s), how to upload teaching materials and record my lecture for self-study for students who could not attend my online lecture (Thanan).

Thai EFL university teachers also noted that, at the initial stage of online instruction, they relied considerably on their academic colleagues and their interactions were based on experience-sharing as well as exploring alternatives to perfect their teaching and promote their students' learning. Often, language teachers disclosed that they could not understand the contents of the VDO tutorials they had watched during their preparation stage of teaching and it was better to have colleagues share their experiences with technology use in online classes. For example:

We created a chat group to share our lessons learnt from online teaching. When we need help from other colleagues who have successfully implemented some techniques or ideas, we just ask for help. Everyone in the group feels the same way as I do. And, this creates such a warm and knowledge-sharing environment mong teachers (Thanan).

The findings indicated that teachers' ICT literacy acquisition occurs from peer-to-peer learning and there has been a critical lack of ICT workshops and professional development programmes to enhance ICT skills for such teachers. As such, both practitioners and university administrators should enact practical training for future unprecedented crises.

The analysis also showed that Thai EFL teachers at a tertiary education developed their ICT literacy skills through the assistance of their

students in class. Specifically, the ICT acquisition of language teachers was further developed via the collaboration between the language learners and teachers within the teaching community. As shown in the below extracts, some language teachers mentioned that their students are native to technology and, as such, teachers asked students in their class how to perform certain technology-related tasks.

When having technical problems, I often asked my students for help. I am an old-fashion teacher. I felt unease every time I turned to Google Classroom or Google Meet+ because I normally teach in a face-to-face setting (Chaiyea).

I sometimes ask my students about what to do, for example, to mute other students in class, to share others' screen when presenting the data, and to respond to students' chats. I am so new to this shift. Sometimes I needed to ask students about their preferred application and activities to promote their learning. Over the semester, I had always asked my students about that (Bussaya).

Some Thai EFL university teachers also highlighted the key point concerning the instantaneous shift from classroom-based instruction to online teaching and expressed that, at the beginning, language teachers were overwhelmed and anxious to perform their class online as regulated by the universities. This rapid shift also meant that, sometimes, the only resource that teachers could rely on for technological assistance was their students.

I did not know where to turn myself to because all of my teacher fellows are facing the same problem at the beginning. I needed to teach online and what I could do at that time was yielding for help from my students who were better at technology (Chaiyea).

I also asked my students because they could also teach me how to do technical things. some questions my students did not know how to do and they could find some techniques to help me in the following day (Thanan).

Thai EFL university teachers needed to cooperate with their students to effectively deliver their lesson and help students learn and use a target language. This finding was consistent with Roddy et al (2017) who argued that communication between these two stakeholders could



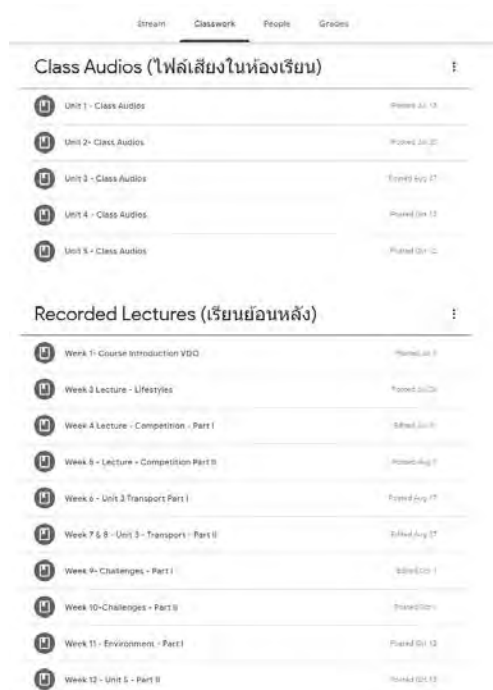
potentially enhance online learning by promoting optimal learning outcomes for the students. To achieve this, teachers needed to balance, (re)design, and incorporate their content and pedagogical knowledge to effectively perform their teaching during the epidemic of COVID-19.

During online teaching, EFL university teachers also acquired ICT literacy skills through their ongoing needs analysis. That is, language teachers performed an ongoing needs analysis, exploring not only target language needs, but also technological support to engage students' online learning. Over the period of online instruction, multiple folders based on students' learning needs (see Figure 2) had been created for those unable to participate in normal online lectures. Some additional materials (e.g., linguistic features, audio files for extensive listening practices, and glossaries) were also provided. Some teachers highlighted that they needed to implement what they believed to be practical in their online lessons. Some pedagogical activities were effective while many were not, as illustrated in the following statements:

I often tried out what I believed to be good for my students in my online class. But, it does not mean that all hypotheses will be working out. I need to check students' reactions, understanding and other things to adjust my teaching. Adjustment means that I need to find new pedagogical activities in conjunction with technological alternative to support my teaching (Bussaya).

I felt overwhelmed to move a normal class to online one because I had never done a 100% online class before. I tried to redesign and adjust my lecture by trying out my lectures with interactive participation through LMS. Every time I met my students, I changed my ways of teaching because it failed to fit in an online context. I did like this until the end of the semester. I survived (Chaiyea).

Figure 2

*Google Classroom with Folders Based on Students' Needs*

Teachers' beliefs and cognition regarding online teaching at the initial stage were also altered due to the contextual factors emerging from technology use. Previous studies have also reported that contextual factors can influence the relationship between teachers' cognition and online classroom practices (Borg, 2019; Sun & Zhang, 2019). Moreover, the teachers' TPACK was also developed based on students' needs in terms of language and ongoing technological support in an online teaching environment. In line with Gao and Zhang (2020), the current study showed that EFL teachers developed their ICT literacy by understanding language learners' needs for online learning tasks. However, in their study, Chinese teachers of English rarely acquired their ICT skills through the collaboration of learners and teachers because teachers are positioned as the ultimate resource of knowledge, which includes the knowledge of technology to use in learning and teaching. This demonstrates that, even within similar

EFL contexts, language teachers can acquire their ICT literacy skills using different methods.

### 4.3 ICT Literacy Acquisition After Online Teaching

The analysis further revealed that Thai EFL university teachers continued to develop their ICT literacy through formal workshops during which they could share their experience with technological experts from their educational institutes. Attending formal workshops offered by their universities was believed to improve their ICT literacy skills. However, these workshops occurred at a late stage of online teaching (during the middle to the end of the semester) as the universities had to adopt measures to comply with the national regulation in protecting its citizens from COVID-19 transmission. Thai EFL university teachers engaged in training programmes or workshops, including a workshop on how to effectively use Google Classroom as a learning management system (LMS), how to use Zoom for online teaching, redesigning assessments during COVID-19, how to teach during the epidemic, and how to run a webinar. Below are some of the participants' responses regarding these workshops:

I enrolled in many online workshops to sharpen my ICT skills so that I can deliver my lecture online. Some workshops were organised by my own university while many were hosted by other universities across Thailand. I learnt tremendously from those workshops I attended (Bussaya).

What I concerned the most is assessments – how to assess our language ability through online platforms. I think we should redesign our learning assessments so that we can tide over the crisis. I decided to attend an online workshop hosted by various universities from both in Thailand and overseas. At the end of the day, I need to come up with my own conclusion to assessing students' ability (Thanan).

This expert-to-teacher learning through the formal workshops plays a vital role in developing ICT skills and literacy. EFL university teachers were able to improve their ICT literacy through participating in international discussions on various topics, including online teaching and assessment, from their own universities and international universities. Having access to technology experts brought some relief and validation to language teachers as they could rely on the expertise of those with more

knowledge in technology. Indeed, all EFL teachers agreed that learning with the ICT experts improved their confidence in online teaching environment. The language teachers were able to use the advice of the experts to redesign their classroom-based pedagogical activities to fit the online context. Importantly, this learning could assist the effective integration of classroom-based instruction to online teaching, which may help sustain the use of technology in classroom-based teaching in their post-COVID teaching. The following extracts and Figure 3 support this finding:

ICT Workshops helped me plan my online lessons about how to teach and which platform best facilitate certain skills of language. I felt more confident to use different tools for my online teaching. I could deal with some ongoing technical problems, too (Chaiyeen).

I think after COVID-19 I will still use some activities from online teaching and learning to better help my students learn on their own and I believe that this will help build up their confidence in learning and using English language in their daily life (Bussaya).

### Figure 3

*Google Forms Used in Teaching and Assessment in Online Teaching During COVID-19.*



The extracts reveal that the EFL teachers' ICT literacy developed over the period of COVID-19 and their beliefs concerning online learning were also altered due to their online teaching experiences. This reconfirms the concept that teachers' beliefs and cognitions are normally shaped by their prior teaching experiences (Gao, 2019; Flórez & Basto, 2017; Zhang & Rahimi, 2014). These extracts also show that the teachers' involvement in formal workshops hosted by either their own university or other educational institutes improved their confidence in online teaching and helped them to integrate traditional methods of teaching with online modes, which has been a challenge in Thailand and other similar EFL contexts. Together, this allowed the teachers to promote the students' learning autonomy. As such, extensive and comprehensive training and workshops vis-à-vis teaching with technology should be taken into consideration by administrators, policy makers, and educators to promote more pragmatic online teaching approaches and methods with effective technology integration.

Overall, although the COVID-19 interruption on education has been eased, Thai EFL university teachers are still developing their ICT literacy with hopes that this literacy will be used in future instruction. As indicated in the extracts, some attended virtual conferences and webinars offered both domestically and internationally to improve their TK, CK and PK. This reveals that ICT literacy acquisition for online instruction is an ongoing process and language teachers need to build their TCK, PCK and TPK at different stages to eventually improve their overall Technological Pedagogical Content Knowledge (TPACK). Indeed, Koehler and Mishra (2005, p. 134) argue that "good teaching is not simply adding technology to the existing teaching and content domain. Rather, the introduction of technology causes the representation of new concepts and requires developing a sensitivity to the dynamic, transactional relationship between all three components suggested by the TPCK framework." This is not merely relevant for online teaching during COVID-19, but for future instruction for generations to come.

## 5. Research Implications

Classroom-based instruction has been shifted to online instruction due to the COVID-19 pandemic. The current analysis revealed the methods that Thai EFL university teachers used to acquire their ICT literacy. It

appears that ICT has been less emphasised in language classrooms, especially English classrooms, in Thailand. Although preservice teacher education offers ICT-related subjects for teacher students, ICT literacy has not been translated or well-integrated into authentic classrooms. As such, when teachers moved their teaching from a classroom-based mode to an online mode, language teachers encountered difficulties related to their own abilities, teaching regulations, and expectations from students. Thus, to cope with this problem and to prepare for any future COVID-related crisis, administrators may consider offering more practical workshops on “alternative educational technology” (Inpeng & Nomnian, 2020, p. 385). This will allow language teachers to continuously develop the ICT skills necessary for either classroom-based teaching, future online teaching, or hybrid teaching (a combination of online and on-site instruction). Moreover, these skills will assist language teachers in integrating their traditional teaching methods with more up-to-date teaching methods to cater to language learners with a variety of learning styles, motivations and personal interests (Hockly, 2018).

Finally, as evident in the findings, language teachers need to perform an ongoing needs analysis to support the students’ learning in terms of technological needs, target language needs, and other factors influencing online learning. Online instruction differs from classroom-based instruction. Specifically, accessibility to the internet and learning resources play a large role in online instruction. Administrators must therefore seriously consider these factors when managing online learning and teaching during COVID-19 and future COVID-like circumstances. Teacher educators may also need to (re)design pedagogical tasks that are flexible in nature to equip preservice teachers for hybrid instruction, rather than sole online teaching, when the COVID-19 pandemic is over. This will also foster the relationship between their technological knowledge (TK), content knowledge (CK) and pedagogical knowledge (PK) in their own pedagogical context, which will benefit language education.

## 6. Conclusion

The current research was designed to investigate EFL University teachers’ methods of acquiring ICT literacy for their online teaching during the COVID-19 epidemic in a Thai EFL context. The findings contribute to

the existing research area of teacher cognition and ICT literacy acquisition based on the TPACK model (Koehler & Mishra, 2005). Specifically, EFL teachers used five methods to acquire their ICT: self-exposure to existing online tutorials, peer-to-peer learning, student-to-teacher collaboration, ongoing teaching practice, and expert-to-teacher learning in formal workshops. Moreover, their ICT literacy acquisition occurred in three stages – before, ongoing and after online teaching. Second, the findings also expanded our understanding of translating classroom-based (traditional) teaching into online instruction, which was rarely implemented in the pre-COVID-19 period in the Thai EFL context. Importantly, all the methods that language teachers used to develop their ICT literacy were interrelated, resulting in improved teacher confidence in online teaching as well as improved TPACK. These skills will be extremely valuable for future COVID-like situations that require total online instruction. Nevertheless, it should be noted that the sample size of the current study was small and qualitative in nature, which may limit the generalisability of the findings to other contexts (e.g., an ESL context). Moreover, voices from other stakeholders, especially students and administrators, may provide additional robustness to the results.

### Acknowledgements

I wish to express my sincere gratitude to the LEARN Journal editorial teams for considering this paper for publication. My appreciation also goes to the peer reviewers for their constructive feedback to improve the quality of the manuscript. Last, thank you to the participants for their time and voluntary participation. Without their contribution, this research project would not have been achieved.

### About the Author

**Thebpor Kanchai:** an English language lecturer at Mahasarakham University, Thailand. He obtained his M.Ed. in TESOL from the University of Sydney, Australia. His research interests fall into the fields of English Language Teaching (ELT), Teacher Education, CEFR in Thailand, English for Specific Purposes (ESP) teachers, Critical Discourse Analysis (CDA) and issues related to L2 pedagogy.

---



---

## References

- Bailey, D., Park, I., & Haji, S. (2019). An investigation of Facebook for language learning: Better understanding perceptions and participation. *CALL-EJ*, 18(2), 12-28.
- Bangkok Post. (2020). 13 new Covid-19 cases. <https://www.bangkokpost.com/thailand/general/2029531/13-new-covid-19-cases>.
- Bates, A. (2005). *Technology, e-Learning and Distance Education*. Routledge.
- Bawane, J., & Spector, J. (2009). Prioritization of online instructor roles: implications for competency-based teacher education programs. *Distance Education*, 30(3), 383-397. <https://doi.org/10.1080/01587910903236536>
- Bolliger, D., & Martindale, T. (2004). Key factors for determining student satisfaction in online courses. *International Journal On E-Learning*, 6, 61-67.
- Boonchom, W. (2011). *Using English Video Clips to Enhance English Vocabulary of Non-English Majors at Ubon Ratchatani Rajabhat University*. (Published master's thesis). Ubon Ratchatani Rajabhat University. Ubon Ratchatani, Thailand.
- Borg, S. (2015). *Teacher Cognition and Language Education: Research and Practice*. Bloomsbury.
- Borg, S. (2019). The Impact of Language Teacher Professional Development. In G. Barkhuizen, *Qualitative Research Topics in Language Teacher Education* (pp. 44-49). New York, US: Routledge.
- Brown, A. (1997). Features of an effective online course. *Australasian Journal of Educational Technology*, 13(2), 115-126. <https://doi.org/10.14742/ajet.1926>
- Buangam, P. (2010). *Using CALL Program to Teach Subject Verb Agreement: A Case Study of M.3 Students* (Published master's thesis). Ubon Ratchatani University, Ubon Ratchatani, Thailand.
- Chamkam, J. (2011). *Use of SQ3R Technique with Electronic Books to Promote English Reading Comprehension and Vocabulary Knowledge of Developing Level Students* (Published master's thesis). Chiang Mai University, Chiang Mai, Thailand.



- Chapelle, C. (2005). Computer-assisted language learning. In E. Hinkel, *Handbook of Research in Second Language Teaching and Learning* (pp. 743–755). Lawrence Erlbaum Associates.
- Creswell, J. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. USA: SAGE Publication Inc.
- Creswell, J. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). SAGE Publication Inc.
- Demouy, V., Jones, A., Kan, Q., Kukulska-Hulme, A., & Eardley, A. (2016). Why and how do distance learners use mobile devices for language learning? *The Eurocall Review*, 24(1), 10. <https://doi.org/10.4995/eurocall.2016.5663>
- Denzin, N., & Lincoln, Y. (2011). *The SAGE handbook of qualitative research*. Sage Publications.
- Dörnyei, Z. (2007). *Research Methods in Applied Linguistics: Quantitative, Qualitative and Mixed methodologies*. Oxford University Press.
- emergencies/novel-coronavirus-2019.
- Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computers & Education*, 50(2), 491-498. <https://doi.org/10.1016/j.compedu.2007.09.016>
- Flórez, S., & Basto, E. (2017). Identifying Pre-Service Teachers' Beliefs About Teaching EFL and Their Potential Changes. *PROFILE Issues In Teachers' Professional Development*, 19(2), 167-184. <https://doi.org/10.15446/profile.v19n2.59675>
- Fu, W., & Zhou, H. (2020). Challenges brought by 2019-nCoV epidemic to online education in China and coping strategies. *Journal of Hebei Normal University (Educational Science)*, 22(2), 14-18.
- Gao, L. (2019). *Teacher Cognition and Practice in Classroom Listening Instruction: Case Studies of Five English-as-a-Foreign-Language (EFL) Teachers in a Chinese University* (Ph.D. Thesis). The University of Auckland, Auckland.
- Gao, L., & Zhang, L. (2020). Teacher Learning in Difficult Times: Examining Foreign Language Teachers' Cognitions About Online Teaching to Tide Over COVID-19. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.549653>
- Grant, M., & Thornton, H. (2007). Best practices in undergraduate adult-centered online learning: mechanisms for course design and delivery. *MERLOT Journal of Online Learning and Teaching*, 3(4), 346-356.

- Hockly, N. (2018). Blended Learning. *ELT Journal*, 72(1), 97-101.
- Homla, R. (2009). *Promoting English Vocabulary Knowledge and Listening Ability of Higher Vocational Level Students Through Movies* (Published master's thesis). Chiang Mai University, Chiang Mai, Thailand.
- Hung, M., Chou, C., Chen, C., & Own, Z. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education*, 55(3), 1080-1090. <https://doi.org/10.1016/j.compedu.2010.05.004>
- Inchai, P. (2011). *The Development of the Electronic Book on the Topic of "Present Simple Tense" for Mathayomsuksa 2 Students* (Published master's thesis). Rajabhat Maha Sarakham University, Maha Sarakham, Thailand.
- Inpeng, S., & Nomnian, S. (2020). The Use of Facebook in a TEFL Program Based on the TPACK Framework. *LEARN Journal: Language Education and Acquisition Research Network Journal*, 13(2), 369-393.
- Intrapairote, A., & Srivihok, A. (2003). An e-learning framework for tertiary education in Thailand. In *GSB Doctoral Conference*. Curtin University, Perth, Australia.
- Jansangsri, S. (2007). *Use of Computer-Assisted Language Learning (CALL) to Develop Reading Comprehension: A Case Study of First-year Electronics-major Students at Mahasarakham Technical College* (Published master's thesis). Mahasarakham University, Maha Sarakham, Thailand.
- Jaturapol, L. (2012). *The Development of English Words Spelling and Reading Skills by Multimedia Computer Lesson of Phonics with Group Activity for the Third Grade Students* (Published master's thesis). King Mongkut's University of Technology Thonburi, Bangkok, Thailand.
- Jinda, A., & Bangthamai, E. (2016). The problems and guidelines support of use Information and Communication Technology for Educational of Schools in Nakhon Pathom Primary Educational Service Area Office 2. *Veridian E-Journal, Silpakorn University*, 9(1), 395-407.
- Johnson, K. (2015). Behavioral Education in the 21st Century. *Journal of Organizational Behavior Management*, 35, 135-150. <https://doi.org/10.1080/01608061.2015.1036152>
- Jungsatidkul, S. (2012). *The Development Listening Skill of Prathomsuksa 5 Students of Huachiewkonghuk Ubon School Trough Animated Soundtrack Series* (Unpublished master's thesis). Ubon Ratchatani Rajabhat University, Ubon Ratchatani, Thailand.

- Kaitbanditkul, N., & Wongwanich, S. (2015). Effects of Teacher Education Programs on Instructional Design Knowledge with Student Teachers' Self-Efficacy Perception and TPACK Framework Knowledge. *Thammasat Review*, 18(1), 163-176.
- Kanchai, T. (2019). Thai EFL University Lecturers' Viewpoints towards Impacts of the CEFR on their English Language Curricula and Teaching Practice. *NIDA Journal of Language and Communication*, 24(35), 23-47.
- Karnjanaboon, N. (2012). *Factors Affecting Listening Comprehension while Watching the American Sitcom "Friends"* (Published master's thesis). King Mongkut's University of Technology Thonburi, Bangkok, Thailand.
- Khotmongkhon, T. (2011). *The Development of Skill Program on the Pronunciation of Homographic Vocabulary for Prathomsuksa 6 Students at Pakhhuaywangnong School, Ubon Ratchathani Province* (Published master's thesis). Ubon Ratchatani Rajabhat University, Ubon Ratchatani, Thailand.
- Koehler, M., & Mishra, P. (2005). What happens when teachers design educational technology? The development of technological pedagogical content knowledge. *Journal of Educational Computing Research*, 32(2), 131-152. <https://doi.org/10.2190/OEW7-01WB-BKHL-QDYV>
- Kongkapet, N. (2007). *The Effects of Web-based English Reading Instruction Using Project-based Language Learning on Reading Comprehension Ability of Phetchaburi Rajabhat University Students*. (Published master's thesis). Chulalongkorn University, Bangkok, Thailand.
- Kukulska-Hulme, A. (2009). Will mobile learning change language learning?. *Recall*, 21(2), 157-165. <https://doi.org/10.1017/s0958344009000202>
- Lamjuanjit, Y. (2009). *Enhancing Writing Strategies through a CALL Program* (Published master's thesis). Khon Kaen University, Khon Kaen, Thailand.
- Liu, J., Yu, S., & Ran, M. (2008). Research on the Communicative Mobile English Learning Model. In *Fifth IEEE International Conference on Wireless, Mobile, and Ubiquitous Technology in Education (WMUTE 2008)* (pp. 60-64). Beijing. [Http://doi: 10.1109/WMUTE.2008.26](http://doi:10.1109/WMUTE.2008.26).

- Magagula, C., & Ngwenya, A. (2004). A comparative analysis of the academic performance of distance and on-campus learners. *Turkish Online Journal of Distance Education-TOJDE*, 5(4), 1-11.
- Malathong, Y. (2010). *The Development of Achievement in English Reading Comprehension of the First Year Students at Sakon Nakhon Rajabhat University through Computer-Assisted Instruction* (Published master's thesis). Khon Kaen University, Khon Kaen, Thailand.
- Manajitt, P. (2008). *The communicative language teaching (CLT) conceptualization and CLT practice of Thai EFL school teachers in Bangkok* (Unpublished doctoral dissertation). Mahidol University, Thailand.
- Manyawech, N. (2012). *Cooperative Learning-Based Computer – Assisted Instruction on “Present Continuous Tense” for Prathomsuksa 3 Students* (Published master's thesis). Chiang Rai Rajabhat University, Chiang Rai, Thailand.
- Merriam, S. (1998). *Case Study Research in Education: A qualitative Approach*. Jossey-Bass.
- Merriam, S., & Tisdell, E. (2016). *Qualitative Research: A guide to Design and Implementation* (4th ed.). Jossey-Bass.
- Miles, M., Huberman, A., & Saldaña, J. (2014). *Qualitative data analysis* (3rd ed.). Sage Publications, Inc.
- Niyomsap, S., Thongthaw, S., & Rodpothong, S. (2013). A curriculum Development Utilising TPACK as Content Framework to Enhance Digital Courseware Production Competency for Teachers. *Silapakorn University Journal of Social Sciences, Humanities and Arts*, 13(1), 157-177.
- Nomnian, S., & Arphattananon, T. (2018). A qualitative study on factors influencing achievement of English language teaching and learning in Thai government secondary schools. *Asian EFL Journal*, 20(6), 207-233.
- Palmer, S. (2012). Understanding the context of distance students: differences in on- and off-campus engagement with an online learning environment. *Journal of Open, Flexible and Distance Learning*, 16(1), 70-82.
- Phetchmune, S. (2004). *Effects of Look up Behavior on the Acquisition and Retention of English Vocabulary among Prince of Songkla University First Year Students Using Computer-Assisted Language Learning*

- 
- Reading Material* (Published master's thesis). Prince of Songkla University, Songkla, Thailand.
- Phooprasartporn, K. (2012). *Using Movies and Role Playing to Promote English Listening and Speaking Abilities and Self-confidence Among First Year Students* (Published master's thesis). Chiang Mai University, Chiang Mai, Thailand.
- Raksasab, K. (2010). *Using CALL Program to Develop English Minor Students' Idiomatic Expressions from "Friends" Series* (Published master's thesis). Khon Kaen University, Khon Kaen, Thailand.
- Roddy, C., Amiet, D., Chung, J., Holt, C., Shaw, L., & McKenzie, S. et al. (2017). Applying Best Practice Online Learning, Teaching, and Support to Intensive Online Environments: An Integrative Review. *Frontiers in Education*, 2. <https://doi.org/10.3389/feduc.2017.00059>
- Rovai, A. (2003). In search of higher persistence rates in distance education online programs. *The Internet and Higher Education*, 6(1), 1-16. [https://doi.org/10.1016/s1096-7516\(02\)00158-6](https://doi.org/10.1016/s1096-7516(02)00158-6)
- Rovai, A., & Downey, J. (2010). Why some distance education programs fail while others succeed in a global environment. *The Internet and Higher Education*, 13(3), 141-147. <https://doi.org/10.1016/j.iheduc.2009.07.001>
- Ruangrong, P., Jirawongphong, P., Manyum, W., Somyarone, W., Muendetch, S., & Srisurat, C. (2014). Educational technology vs Thai teachers in 21st century. *Panyapiwat Journal*, 5(1), 195-207.
- Shulman, L. (1986). Those who understand: knowledge growth in teaching, 15(2), 4-14. <https://doi.org/10.3102/0013189X015002004>
- Simasathiansophon, N. (2014). A Perspective on Blended-Learning Approach through Course Management System: Thailand's Case Study. *International Journal of Information and Education Technology*, 4(2), 172-175. <https://doi.org/10.7763/ijiet.2014.v4.392>
- Singsri, S. (2011). *Development of CAI to Improve English Speaking Skill of Nurses in Thatphanom Crown Prince Hospital* (Published master's thesis). Ubon Ratchatani Rajabhat University, Ubon Ratchatani, Thailand.
- Sombuntham, S., & Khlaisang, J. (2013). Thailand Cyber University and the best practice for open online courseware's services. In *The Asia Regional Open Courseware and Open Education Conference 2012*. Bangkok, Thailand; Japan Open Courseware Consortium and Office of the Higher Education Commission.

- Srichom, S. (2011). *Improving the English Pronunciation of Students in Prathomsuksa 6 with a Computer-Assisted Instruction Program*. (Published master's thesis). Burapha University, Chonburi, Thailand.
- Srinut, P. (2005). *Internet English Learning to Promote English Writing Skill and English Learning Motivation* (Published master's thesis). Chiang Mai University, Chiang Mai, Thailand.
- Sun, Q., & Zhang, L. (2019). Ontological, epistemological, and methodological perspectives on research into language teacher cognition. *Foreign Language Research*, 38, 73–81. <https://doi.org/10.16263/j.cnki.23-1071/h.2019.02.012>
- Tai, H., Pan, M., & Lee, B. (2015). Applying Technological Pedagogical and Content Knowledge (TPACK) model to develop an online English writing course for nursing students. *Nurse Education Today*, 35(6), 782-788. <https://doi.org/10.1016/j.nedt.2015.02.016>
- Tananuraksakul, N. (2016). Blended E-learning as a Requirement for Teaching EFL in a Thai Academic Context. *Teaching English with Technology*, 16(4), 48-55. [Http://www.tewtjournal.org](http://www.tewtjournal.org).
- Thammetar, T., & Duangchinda, V. (2013). Thailand Cyber University (TCU) Project and its best practice for open courseware and education through the nine university hubs in nine regional areas across Thailand. In *The Asia Regional Open Courseware and Open Education Conference 2012*. Bangkok, Thailand; Japan Open Courseware Consortium and Office of the Higher Education Commission.
- Vichaidit, O. (2012). *The Development of Multimedia Computer Lessons by Synectics Technique to Enhance Writing Competence on Adjectives of Matthayomsuksa 3 Students* (Published master's thesis). King Mongkut's University of Technology Thonburi, Bangkok, Thailand.
- Volery, T., & Lord, D. (2000). Critical success factors in online education. *International Journal of Educational Management*, 14(5), 216-223. <https://doi.org/10.1108/09513540010344731>
- Wang, Y., Wang, Y., Li, Y., & Li, D. (2020). Countermeasures and suggestions for improving the quality of online education during the epidemic prevention and control. *China Medicine Education and Technology*, 34(119-124), 128.
- WHO. (2020). *Coronavirus*. Who.int. <https://www.who.int/thailand/>

---

Zhang, L., & Rahimi, M. (2014). EFL learners' anxiety level and their beliefs about corrective feedback in oral communication classes. *System*, 42, 429-439. <https://doi.org/10.1016/j.system.2014.01.012>

## Appendix

Semi-structured interview question examples for before-online-teaching

1. How do you find online teaching so far?
2. At the beginning of the COVID-19, how did you move your teaching in classroom to online teaching?
3. How did you prepare yourself to teach online in a short period of time?
4. How did you learn how to use different applications to teach your students?
5. How did you adjust yourself and your teaching for online teaching?

Semi-structured interview question examples for during-online-teaching

1. How do you find online teaching now?
2. How did you solve those problems?
3. Which online teaching platform are you using to teach your students?
4. How are you dealing with technical issues during the class?
5. Could you please share your experiences about online teaching?

Semi-structured interview question examples for after-online-teaching

1. How do you feel about your online teaching that has just ended?
2. Are you still learning how to use certain technology or applications for teaching?
3. What are your thoughts on your ability to use technology in teaching now?
4. Are you considering or attending any workshop on technology and ICT?
5. Anything you wish to raise for future online teaching?