

## **Teachers' Perceptions and Experience in Using Technology for the Classroom**

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### **Abstract**

In the digital era, technology plays an important role in the creation and exchange of knowledge and information in the field of education. When technology is applied in educational settings, it may increase teacher knowledge and support students' learning and motivation. Over the last decade, social networking (including its integration with online games and educational content) has been introduced in classrooms to support teaching (Johnson & Germain-Froese, 2016). Many of these tools are free and easy for teachers to use to create learning content. However, these tools may not have an educational value in and of themselves. They only become important when teachers use them as part of the learning and teaching process. The decision about whether to use technology in the classroom often depends on the perceptions of each teacher. This study, therefore, investigated how teachers in secondary schools use technology in their classrooms and their perceptions of the use of technology. The participants in this study were 126 Thai secondary teachers supported by the Ministry of Education's Secondary Educational Service Area Office 33 (Surin Province). These teachers were language teachers from 58 secondary schools in 17 districts of Surin, Thailand. They were asked to complete questionnaires to report on their use and perceptions of technology use in the classroom. The findings revealed that most of the teachers had knowledge of technological tools and had integrated technologies in their classes. Certain types of tools were already used by all the teachers, while networked educational technology tools were only being integrated into some classrooms. The findings also revealed factors affecting the use and non-use of technology. Based on these findings, pedagogical implications are discussed.

*Keywords:* Teacher perceptions, EFL classrooms, Teacher use of technology, Networked educational technologies

## **Introduction**

In the twenty-first century, technology is becoming increasingly prevalent in our everyday lives. As such, technology has played an important role in creating and exchanging knowledge and information in the field of education. In classrooms, technology may help to increase students' motivation to learn. Networked educational technologies have been widely used in the field of English language learning to promote student-student, teacher-student, and student-learning resources for the last few decades (Goodyear, 2000). Teachers' perceptions are generally considered the main factor affecting the use of technology in EFL classrooms. Since teachers' perceptions are important and are likely to affect how teachers use or do not use technological tools in their classrooms, this study aimed to investigate how teachers at a secondary level use networked educational technologies and their perceptions of those technologies.

## **Review of Literature**

### **Thailand 4.0**

The world is now changing at a rapid rate and has become more connected than in the past, which has led to increasing levels of economic competition and social transformation. As part of these changes, information, and communication technology (ICT) has had a massive impact on people's lives (Buasuwan, 2018). To respond to the changes regarding ICT, the government of Thailand has created the Thailand 4.0 agenda, which is an economic model based on creativity, innovation, new technology, and high-quality services used to boost the quality of life (Bussi & Khatiwada, 2017; Jones & Pimdee, 2017).

To gain a better understanding of the current Thailand 4.0 model, background knowledge of the various Thai economic models will be clarified according to the research of Jones and Pimdee (2017). These different models have been used to describe the sequential development of the Thai economic system through four eras: Thailand 1.0, Thailand 2.0, Thailand 3.0, and Thailand 4.0. The first period of the economic model was Thailand 1.0, in which agriculture played an important role. The second stage was Thailand 2.0 when light industries were the focus. For Thailand 3.0, heavy industries and exports became the focus. The last and current stage is Thailand 4.0, which is a new economic policy to help the country step out of economic traps and move forward by using technology integration.

In the Thailand 4.0 model, technology is used to transform the national economy with innovative technology-based manufacturing and services ("Thailand 4.0", 2017). In other words, the Thailand 4.0 model will use automation to assist individuals in their work, freeing them from low-level labour and increasing the capability of the technology. The

main benefit of the model is the use of technology integration to enhance Thailand's economic prosperity and well-being for the future.

In addition to supporting Thailand's economic situation, the blueprint of Thailand 4.0 also requires new approaches in the field of education. Teachers who are currently working in educational institutions are being pressured to change the way they teach by integrating more technology in their classrooms due to the influence of Thailand 4.0 (Buasuwan, 2018). Still, there are challenges in technology integration in the Thai education system as many Thai teachers have been primarily trained in the use of traditional approaches. Therefore, teachers are likely to have difficulty adapting to new approaches, such as integrating ICT into their classrooms. In addition, for teachers, poor quality education and education inequality remain barriers blocking the reform of the Thai education system through the use of the Thailand 4.0 model (Buasuwan 2018; Wittayasin, 2017). The new policy and the growing push for ICT in Thai education due to its potential impact have resulted in the greater implementation of computer-assisted language learning (CALL) and mobile-assisted language learning (MALL) in Thai education contexts.

Computer-assisted language learning (CALL) is briefly defined by Levy (1997) as "the search for and study of applications of the computer in language teaching and learning" (p. 1). CALL embraces a wide range of ICT applications and approaches to teaching and learning foreign languages, from traditional teaching approaches to more recent manifestations, such as virtual learning environments and web-based distance learning (Schmid, 2009). In the twenty-first century, mobile devices are also used for language learning. Mobile-assisted language learning (MALL) is language learning that is assisted or enhanced through the use of a mobile digital device. MALL differs from CALL in its use of personal, portable devices that enable new ways of learning; it focuses on the continuity or spontaneity of access and interaction across different contexts of use (Chinnery, 2006; Kukulska-Hulme & Shield, 2008).

Various researchers worldwide have studied CALL and MALL in classroom settings. CALL and MALL are believed to be useful teaching approaches that provide a positive atmosphere and better student performance under certain conditions. However, there are challenges in the use of technology in the classroom such as inadequate time, insufficient computer facilities, lack of administrative support, teachers' limited computer skills, and teachers' perceptions of CALL (Almekhlafi, 2006; Baleghizadeh & Oladrostam, 2010; Nim Park & Son, 2009; Wu, 2019).

Nim Park and Son (2009) investigated factors affecting EFL teachers' use of computers in the classroom. The results indicated that Korean teachers teaching English had positive attitudes towards the use of computers. The researchers stated that computer technology was a useful teaching tool that could provide students with a variety of language inputs and examples of authentic contexts. However, some negative factors affected the use of technology in the classes. The teachers thought that external factors, such as inadequate time, insufficient computer facilities, inflexible school curricula, and

textbooks, and a lack of administrative support, negatively influenced CALL implementation in EFL classrooms. Internal factors such as a teacher's limited computer skills and perceptions of CALL can also meaningfully affect his or her decisions on the use of CALL. Almekhlafi (2006) reported on the effects of CALL with EFL students at a school in the United Arab Emirates. The participants in the experimental group had a positive attitude toward CALL. They perceived CALL as a tool for scaffolding their EFL learning, and they showed a willingness to use it in the future. Wu (2019) explored EFL students' learning preferences and experience of the MALL. The data from a survey of 235 Chinese university students suggested that the students were generally positive about the use of mobile devices in language learning, and they appreciated the value of mobile devices in supporting their autonomous learning. In Iran, Baleghizadeh and Oladrostam (2010) investigated the use of technology in teaching and learning environments in EFL classes. Their study was conducted to study the improvement of grammatical knowledge of EFL students by using mobile phones. The Iranian students were separated into an experimental group and a control group. The results showed that the participants who had benefited from the mobile-assisted learning had significantly better performance on a multiple-choice grammar post-test than the participants in the control group.

It is concluded that CALL and MALL positively influence EFL classrooms in many ways with classroom engagement, various inputs, authentic contexts, the learning experience, and students' and teachers' preferences. In the final decades of the twentieth century, there was a global technology boom. The recent generation of students in grades K-12 have lived their entire lives with access to technology and are so-called "digital natives", a term which Prensky (2001b) coined to describe students who have always been surrounded by technology. Teachers, or "digital immigrants", are those who have had to adapt to the language and learning styles of these digital natives later in life. CALL and MALL have helped paved the way for ubiquitous learning since the beginning of the digital technology era (Kannan & Munday, 2018; Petersen & Sachs, 2015).

### **Networked Educational Technologies**

Nowadays, educators are rapidly moved to a stage of technological development marked by the widespread availability of online face-to-face communication courses and open access online courses (Petersen & Sachs, 2015). A fluidity of technologies has also allowed information and communications technology (ICT) to promote a new teaching approach entitled networked learning (NL; Kannan & Munday, 2018; Petersen & Sachs, 2015). Networked learning is defined as learning in which ICT is used to promote connections between learners, between learners and teachers, and between learners and learning resources (Goodyear, 2001; Yang, 2007).

In the teaching of language, networked learning supports today's learners to connect globally, access resources openly and easily and self-regulate their learning processes (Kannan & Munday, 2018). A benefit of networked learning, which is related to

its fundamental concept of connectivity, is digitally networked technologies. To actualize networked technologies in language classrooms, they need to be used by both teachers and students.

Networked technologies in education include social networking both inside and outside of the classroom. Social networking can include online games, specific educational social networking platforms, and popular general social network platforms (Johnson & Germain-Froese, 2016). To support learning, networked devices are necessary since these technologies cannot be run in classes without the necessary connectivity. Schools often need to provide teachers with networked devices. The students also may need to bring their own networked devices to class, although they may be provided by the school. A previous study in Canada revealed a selection of networked devices provided by schools and students as shown below (Johnson & Germain-Froese, 2016).

**Table 1**

*Networked Devices Provided by Schools and Students*

<b>Networked Devices Provided by Schools</b>	<b>Networked Devices Provided by Students</b>
<ul style="list-style-type: none"> <li>• Smartboards</li> <li>• Desktop computers</li> <li>• Laptops and notebooks</li> <li>• Tablets (e.g., iPads)</li> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Tablets</li> <li>• Laptops</li> <li>• Smartphones</li> <li>• MP3 players</li> <li>• Other</li> </ul>

Networked technologies have several benefits for language learning. Bordonaro (2003) has reported that networked technologies may lead to a *self-directed manner* in language learners. The learners will be learning a target language in a formal classroom setting or outside the classroom in a manner of the student's choosing. The use of network technologies helps assist learners in their pursuit of second language learning, and as such can include the use of specific software packages such as Microsoft Word, the use of the Internet for e-mail, and the use of the web (Bordonaro, 2003).

Apart from devices, technological applications (e.g., Padlet, Quizizz, Plickers, and Edmodo) can be considered as networked technologies since they are designed to captivate and engage users for a particular purpose, which includes learning new knowledge and skills, supporting classroom engagement, reviewing class content, building a positive learning atmosphere and improving students' critical thinking skills (Corti, 2006; Icard, 2014). These technological applications can help create engaging and immersive learning experiences for delivering specified learning goals, outcomes, and experiences (Zin, Jaafar, & Yue, 2009).

Deubel (2006) stated that there are numerous technological tools that are recommended and categorized in websites for EFL/ESL teachers and learners. Examples include Apps 4 EFL ([www.apps4efl.com](http://www.apps4efl.com)), Wandering Educators ([www.wanderingeducators.com](http://www.wanderingeducators.com)), and FluentU ([www.fluentu.com](http://www.fluentu.com)). Various tools on websites, for

example, Socrative ([www.socrative.com](http://www.socrative.com)), Quizizz ([quizizz.com](http://quizizz.com)), Kahoot ([kahoot.it](http://kahoot.it)), Padlet ([padlet.com](http://padlet.com)), Memrise ([www.memrise.com](http://www.memrise.com)), and Mentimeter ([www.mentimeter.com](http://www.mentimeter.com)), have been created for educational purposes. These networked technologies can also be applied as additional options in a lecture-based classroom (Pivec, 2007).

The integration of technology applications with learning and teaching is not novel. In the past decade, studies throughout the world have investigated the effectiveness of technological applications for various courses. Technological application integration can enhance the learning interest of students and further increase their learning motivation (Hwang & Wu, 2012). Many scholars and educators have focused on technological tools for English language teaching in various studies (Bado & Franklin, 2014; Chaiyo & Nokham, 2017; Dellos, 2015; DeWitt et al., 2015; Hwang et al., 2016; Khamprem & Boonmoh, 2019; Putri, 2019; Reinders & Wattana, 2015; Shahriarpour & Kafi, 2014; Wong et al., 2015). Table 2 presents a list of studies that examined technological tools related to networked educational technologies in English language teaching (ELT).

**Table 2**

*Technological Tools Related to Networked Technologies in English Language Teaching*

Authors	Technological Tool(s)	Research Purpose(s)	Research Result(s)
<b>Khamprem &amp; Boonmoh, (2019)</b>	Padlet Kahoot Quizizz Plickers	To investigate teachers' stated needs regarding their use of technology and the kinds of technology that they actually used to facilitate learning in their classrooms.	A questionnaire revealed teachers' positive attitudes toward technology. <ul style="list-style-type: none"> <li>• The participants expected to learn new technological skills, to keep themselves updated regarding current developments, and to apply the skills in their classrooms.</li> <li>• However, the interview findings revealed that some teachers did not use technology to facilitate classroom learning because of poor Internet connections, lack of support facilities, unnecessary teaching work, and other related issues.</li> </ul>
<b>Putri (2019)</b>	Kahoot	To investigate the effectiveness of an online application in English language teaching.	<ul style="list-style-type: none"> <li>• The teachers should have knowledge in using the Kahoot online application before teaching. Moreover, before using this online application as a medium for teaching, teachers must have a detailed lesson plan with online application integration. The results showed that Kahoot is effective as a way to make students enjoy the learning process in class.</li> </ul>

<b>Chaiyo &amp; Nokham (2017)</b>	Kahoot Quizizz Google Forms	To explore students' perceptions of digital game-based tools.	<ul style="list-style-type: none"> <li>The results showed that students learned course content from doing quizzes via Kahoot, Quizizz, and Google Forms. However, there were significant differences in concentration, engagement, enjoyment, motivation, and satisfaction. Kahoot and Quizizz presented many more positives over Google Forms when used in the classroom.</li> </ul>
<b>Hwang et al. (2016)</b>	Mobile game-based learning	To find a solution for improving students' speaking skills.	<ul style="list-style-type: none"> <li>These results suggest that game-based learning activities can significantly improve students' speaking skills if driven by a mobile system. Furthermore, these results suggest that learning activities with a mobile system fostered students to practice speaking English as a foreign language (EFL) more frequently as well as to reflect on their speech; create meaningful sentences and speak with greater accuracy and confidence; and practice speaking EFL in an authentic context.</li> </ul>
<b>Dellos (2015)</b>	Kahoot	To review the game-based Kahoot tool.	<ul style="list-style-type: none"> <li>The tool provides teachers with an opportunity to create quizzes, surveys, and discussions that engage students in content knowledge in a competitive gameplay format.</li> </ul>
<b>DeWitt et al. (2015)</b>	Padlet	To explore students' attitudes toward the designed lessons using Padlet.	<ul style="list-style-type: none"> <li>The findings indicated that students could learn and generate new ideas when using Padlet. Hence, Padlet can be used for collaborative learning in the format of a debate to receive new ideas.</li> </ul>
<b>Reinders &amp; Wattana (2015)</b>	Gameplay	To investigate the experiences of five students who had participated in a fifteen-week game-based learning program at a university in Thailand.	<ul style="list-style-type: none"> <li>The results showed that gameplay had a number of benefits for the participants in this study, particularly in terms of lowering their affective barriers to learning and increasing their willingness to communicate.</li> </ul>
<b>Wong et al. (2015)</b>	2D side-scrolling video game	To find solutions for the lack of motivation amongst	<ul style="list-style-type: none"> <li>The proposed solution was digital game-based learning (DGBL) using a classic 2D side-</li> </ul>

		students in language learning.	scrolling video game with original artwork and music. This game featured English language teaching in higher education and consisted of two modules: text and sound.
<b>Bado &amp; Franklin (2014)</b>	An educational video game designed for EFL learning	To investigate high school students' perceptions of game-based learning in an EFL classroom.	<ul style="list-style-type: none"> <li>The majority of students had a positive attitude towards game-based learning. They reported that interacting with the game in small teams contributed to improving their EFL vocabulary and writing knowledge as well as their motivation.</li> </ul>
<b>Shahriarpour &amp; Kafi (2014)</b>	Digital video games	This study applied digital games to develop learning English vocabulary, especially through video games.	<ul style="list-style-type: none"> <li>There were interviews with teachers and students about their observations and reactions toward playing the digital game. The digital games helped increase the learner's motivation, as it changed the environment from rote learning to meaningful learning. Using digital games was one of the factors that made the learners interested and motivated.</li> </ul>

Most of the studies in ELT focused on student perceptions. The related literature, in other words, was limited since teachers' perceptions of technological tools were neglected, especially, regarding the perceptions of secondary education teachers. The recent literature does present how technological tools are used in the classroom as well as stakeholders' (e.g., students, teachers, and educators) perceptions of their use. From these previous studies, technological tools seem to be useful in EFL classrooms.

The factors affecting teachers' use of technology may be related to each technological tool's characteristics. Many of these tools are free to use, and they provide teachers with an easy way to create learning content. However, these tools are not valuable to education in and of themselves. The tools can become meaningful when teachers integrate them into classroom settings. The decision of whether to use digital technology often depends on teachers' perceptions. Therefore, it is essential to focus on secondary education teachers' use of digital game-based learning tools and their perceptions of networked educational technologies in Thai EFL classrooms.

Responding to the current Thai EFL context, the Ministry of Education's Office of the Basic Education Commission (OBEC) recently released a new policy for supporting teacher competence development at the secondary level nationwide. Thai secondary teachers were required to participate in training workshops in different areas regarding teaching in the classroom, such as brain-based learning (BBL) in Thailand 4.0, active learning in the classroom, and the use of technology in classrooms (Office of Basic

Education Commission, n.d.). One of the researchers is an educational supervisor in Surin, which is one of the seventy-six provinces in Thailand. He and his office are involved in providing educational support and services throughout the province, and he has access to all the teachers in its 17 districts. This study, therefore, investigated how these Thai EFL teachers in Surin used technology in their classrooms and their perceptions of that technology use.

## **Research Questions**

1. Do Thai EFL teachers incorporate the use of networked educational technologies in their secondary education classrooms? If so, how do the teachers use them? If not, why not?
2. What are the secondary level teachers' perceptions of networked educational technologies in Thai EFL classrooms?

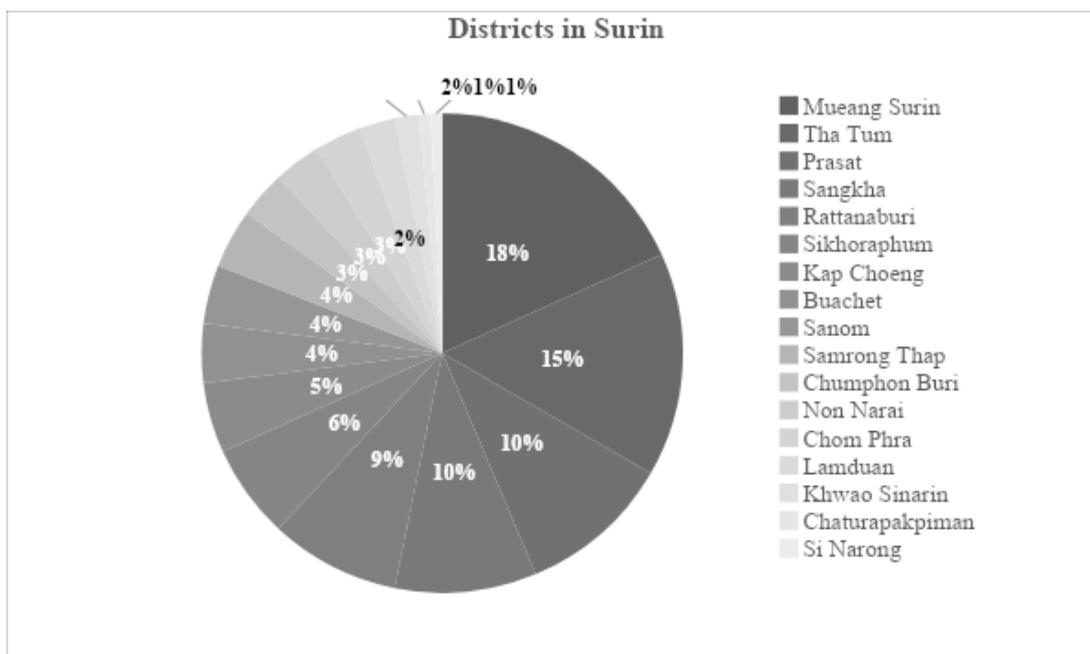
## **Method**

### **Participants**

In this study, 126 Thai secondary level teachers (served by the Secondary Educational Service Area Office 33) were selected from 58 schools representing all the districts within Surin Province. They had attended a teaching training workshop held by the Office of the Basic Education Commission (OBEC). For the data collection, the teachers were asked to complete a questionnaire that asked them to report on their technology use and perceptions of that use in their classrooms. The participants were selected based on consecutive sampling because of accessibility and voluntary participation (Martínez-Mesa et al., 2016). Due to ethical considerations, all target subjects were asked to complete a consent form, and they had the right to withdraw from the study at any time. The proportions and demographics of the participants in the current study are presented below.

### **Figure 1**

*The Proportion of Participants from Different Districts*



As shown in Fig. 1, the participants were mainly from Mueang Surin, Tha Tum, and Prasat, in descending order by the number of participants. There were 23, 19, and 13 participants from Mueang Surin, Tha Tum, and Prasat, respectively, while there was only one participant each from Chaturapakpiman and Si Narong districts.

### Instruments

A questionnaire was used in the current study to elicit information on whether the teachers use technological tools, the type of technological tools in use, and the reasons for use and non-use. The questionnaire consisted of 20 items that were divided into five main parts: teacher's background, classroom settings, use of technology, perceptions of technology, and factors affecting teacher use of technological tools.

### Description of the questionnaire

To gain a clearer understanding of the data collection process, the questionnaire used in the current study is shown in Fig. 2.

### Figure 2

*The Questionnaire Used in This Study*

<b>Questionnaire</b>
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- Factors affecting teacher use of technology in Thai EFL classrooms (Table 6)

For factors affecting teacher use of technology, the data was derived from Likert-scale questions in the questionnaire. In addition to analysing the Likert scale questionnaire, the mean scores were determined and interpreted following Srisa-ard's (2003) rating scale as follows (and is presented in Table 5):

- A mean score from 1.00 to 1.50 is “strongly disagree” or “very low”
- A mean score from 1.51 to 2.50 is “disagree” or “low”
- A mean score from 2.51 to 3.50 is “agree” or “moderate”
- A mean score from 3.51 to 4.50 is “agree” or “high”
- A mean score from 4.51 to 5.00 is “strongly agree” or “very high”

## Results

The results of the study are divided into four parts: analysis of teachers' and students' background information, analysis of teacher use and perceptions of technological applications, analysis of teacher beliefs regarding their uses of technology, and factors affecting teacher use of technology in Thai EFL.

### Analysis of teachers' and students' background information

The teachers' and students' background information is presented below.

**Table 3**

*Analysis of Teacher and Student Background Information*

Categories		Total participants (N=126)	Percentage
<b>Education</b>	<b>Bachelor</b>	83	65.9%
	<b>Master</b>	42	33.3%
	<b>PhD</b>	1	.8%
	<b>Total</b>	126	100.0%
<b>Facilities</b>	<b>Computer</b>	85	18.2%
	<b>Wi-Fi</b>	79	16.9%
	<b>Projector</b>	77	16.5%
	<b>Whiteboard</b>	70	15.0%
	<b>Speakers</b>	56	12.0%
	<b>Microphone</b>	46	9.9%
	<b>Lan</b>	37	7.9%

	<b>Others</b>	17	3.6%
<b>Class size</b>	<b>Less than 30</b>	63	50.4%
	<b>31-35</b>	33	26.4%
	<b>36-40</b>	26	20.8%
	<b>More than 40</b>	3	2.4%
<b>Students' use of smartphone</b>	<b>Yes</b>	119	94.4%
	<b>No</b>	7	5.6%
<b>Your use of smartphone</b>	<b>Yes</b>	126	100.0%
	<b>No</b>	0	0.0%
<b>Your use of computer</b>	<b>Yes</b>	118	93.6%
	<b>No</b>	8	6.4%

Table 3 illustrates the background information regarding the teachers, students, and classroom settings. Concerning the teachers' education, a majority of the participants have completed only their bachelor's degree. With regards to the facilities found in classrooms, computers, Wi-Fi and projectors were the most frequently reported. In terms of the class sizes, 63 out of 126 participants reported that their classes contained less than 30 students, whereas 33 and 26 participants reported that their classes consisted of 31-35 and 36-40 students, respectively. The majority of students reported using smartphones in their lives, whereas there were only seven participants, or 5.6 percent, who did not use smartphones in their everyday lives. In contrast, all the teachers used smartphones in their daily lives. Regarding the extent of teacher use of computers in their classrooms, Table 3 shows that 118 teachers used computers in their classrooms, or 93.6 percent of all the participants, while there were only eight teachers, or 6.4 percent, who did not use computers in their classrooms.

### **Analysis of teacher use and perceptions of technological applications**

The analysis of teacher use and perceptions of technological applications are presented below.

**Table 4**

*Analysis of Teacher Use and Perceptions of Technological Applications*

<b>Categories</b>		<b>Total participants (N = 126)</b>	<b>Percentages</b>
<b>Your use of applications on your computer</b>	<b>YouTube</b>	114	29.0%
	<b>PowerPoint</b>	102	26.0%
	<b>Word</b>	91	23.2%

	<b>Excel</b>	47	12.0%
	<b>Google Drive</b>	29	7.4%
	<b>Others</b>	10	2.5%
<b>Your use of applications on your smartphone</b>	<b>Facebook</b>	123	28.9%
	<b>LINE</b>	123	28.9%
	<b>Messenger</b>	110	25.8%
	<b>Instagram</b>	56	13.1%
	<b>Others</b>	14	3.3%
<b>Experience in using smartphones for teaching</b>	<b>Yes</b>	105	83.3%
	<b>No</b>	21	16.7%
<b>Knowledge of technological applications</b>	<b>Kahoot</b>	124	60.2%
	<b>Quizizz</b>	36	17.5%
	<b>Padlet</b>	28	13.6%
	<b>Plickers</b>	10	4.9%
	<b>Edmodo</b>	5	2.4%
	<b>Quiver</b>	3	1.5%
<b>Use of technological applications in EFL classrooms</b>	<b>Kahoot</b>	63	69.2%
	<b>Quizizz</b>	19	20.9%
	<b>Plickers</b>	4	4.4%
	<b>Padlet</b>	2	2.2%
	<b>Edmodo</b>	2	2.2%
	<b>Quiver</b>	1	1.1%

Table 4 illustrates the teacher's use and perceptions of technology. It shows the teachers' background information regarding applications used in their daily lives as well as how they used technology in their classes. As shown in Table 4, there were five main aspects of technological applications that were asked: (1) teachers' use of applications in computers, (2) teachers' use of applications in smartphones, (3) teachers' experiences in using smartphones for teaching, (4) knowledge of technological applications and (5) use of technological applications in EFL classrooms.

First, the applications that the teachers used in their computers were typically related to teaching. The largest number of participants stated that YouTube, Word, and PowerPoint were the computer-based tools that were used. Second, the applications they used in smartphones were ones that were more related to communication. Facebook, LINE, and messengers were the most frequently used technological tools on smartphones.

Regarding the extent of teachers' experiences in using smartphones for teaching, the result was surprising in that most of the teachers (105 participants) expressed that they had used their smartphones for teaching. When asked about their knowledge of technological applications, all of them, except for two teachers, stated that they knew Kahoot. Only about one-third stated that they knew other applications, such as Quizizz, Padlet, or Plickers.

The last aspect, the use of technological applications in EFL classrooms, was another focus of this study. Interestingly, only half of the participants (63) reported that they had already used Kahoot in their classes, while 19 participants stated that Quizizz had been used in their classes. In other words, Kahoot was the most-used technological tool in the EFL classes at the secondary level in Surin.

### Analysis of teacher beliefs regarding their uses of technology

**Table 5**

*Analysis of Teacher Beliefs Regarding Their Use of Technology*

Categories	Degrees	Totals	Mean
Level of the degree of your technology literacy.	1	2	4.2 (high)
	2	6	
	3	38	
	4	57	
	5	21	
Nowadays, technology is necessary for teaching.	1	0	4.6 (strongly agree)
	2	0	
	3	8	
	4	33	
	5	84	
Using digital technology can help support the learning of students.	1	1	4.4 (agree)
	2	0	
	3	13	
	4	49	
	5	62	

It can be seen in Table 5 that the teachers overall rated all three aspects positively. They strongly agreed that technology is necessary for the classroom and integrating digital technology can help support the learning of students. Moreover, they also perceived themselves to have a high level of technology literacy.

### Factors affecting teacher use of digital game-based learning tools in Thai EFL classrooms

The factors affecting teacher use of networked technologies tools in Thai EFL classrooms are presented below.

**Table 6**

*Factors Affecting Teacher Use of Technology in Thai EFL Classrooms*

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Categories		Totals	Percentages	
<b>External factors</b>	Facilities	393	22.1%	<b>66.2%</b>
	Learners' readiness	223	12.5%	
	Preparation time	182	10.2%	
	Workload	161	9.1%	
	Support from heads of departments	111	6.2%	
	Teaching content	97	5.5%	
	Age	10	0.6%	
<b>Internal factors</b>	Teachers' skills	252	14.2%	<b>33.8%</b>
	Teachers' interests	203	11.4%	
	Confidence	103	5.8%	
	Teachers' beliefs	42	2.4%	

Table 6 lists the external and internal factors that have been shown in the literature to affect teacher use of technology in classrooms. According to the questionnaire, the participants were asked to rank the items that they perceived as barriers blocking them to use technology in their classes on a 1-5 scale. The data were gathered by analysing the rankings from the respondents for each item. In other words, the respondents' most-challenging factor was ranked as 1. The most challenging factor (which they ranked as 1) had the largest weight, and their least preferred choice (which they ranked in the last position as 5) weighted 1.

The teachers believed that external factors, more than internal factors, impacted their use of technology; a total of 66.24 percent of all participants reported that external factors affected their use of technology tools in Thai EFL classrooms, while 33.76 percent of all participants reported some internal factors affecting their use of technology tools in the classes. The total numbers represent the major problems affecting teachers' use of technology in classes. The participants perceived that external factors affected their use of technology in class more than internal factors. As for external factors, facilities, learners' readiness and preparation time were the top-reported aspects. Additional defining elements were workload, support from department heads, teaching content, and age, in declining order of importance. As for internal factors, teachers' skills, teachers' interests, and confidence were the top-reported aspects, while the least-reported aspect was the teachers' beliefs.

## Discussion

According to many previous studies, the use of networked technologies tools is not a recent trend in ELT (Hwang & Wu, 2012). In the current study, all the Thai teachers had used networked technology at the secondary level but only some of the free

technological tools that had been identified (Kahoot, Quizizz, Plickers, Padlet, Edmodo, and Quiver) in their EFL classrooms. Some empirical studies have presented the strengths of the use of technology tools in ELT (Harfield et al., 2007; Khan et al., 2012); however, in practical application, some challenges continue to obstruct the use of technology in ELT classrooms in secondary school contexts.

Overall, most secondary teachers revealed their readiness to integrate technology into their classrooms through having an adequate educational background in English, a background in the use of technology, and experience using it. According to the results, teachers in this current study had adequate background knowledge about applications for teaching. As Surin is one of the more rural provinces in Thailand, the participants from this study were expected to have relatively less information on technology use and technology integration. However, the proportion of teachers who had background knowledge in technological tools in this study was higher than in some comparable studies conducted in Thai higher education and cosmopolitan city contexts (e.g., Khamprem & Boonmoh, 2019; Wiangsima & Boonmoh, 2018). For example, Khamprem and Boonmoh (2019) reported that teachers in vocational contexts did not use technology to facilitate classroom learning because of poor Internet connections, lack of supporting facilities, unnecessary teaching work, and other related issues. Wiangsima and Boonmoh (2018) also reported that some teachers in an urban fringe area did not use technological tools much in their classes.

According to the aforementioned information, the participants in this study had a broad knowledge of technology. However, some teachers still did not use available applications in their classrooms. The potential factors blocking their uses of technology include the external factors shown in Table 6. Interestingly, in this study, inadequate facilities were one of the external factors that were mentioned as a factor blocking the teachers' use of technology. However, the results from Table 4 were in agreement with the results from Table 3. Only 18.2, 16.9, and 16.5 percent or 85, 79, and 77 participants, respectively, out of 126 indicated that there were computers, Wi-Fi, and projectors in their classrooms. Some technological tools require a variety of capabilities in a classroom, for example, Kahoot, Quizizz, and Padlet. In this study, the data suggest that Kahoot was the most-used exercise-generating application in EFL classrooms, as reported by 63 participants, or 69.2 percent, of all the participants. However, given that there were a limited number of applications asked about in the questionnaire, Kahoot is probably not the most used technological tool overall. The results would have likely been different if an open-ended comprehensive survey of all technology used was conducted. However, that was not the goal of this study; given the ever-changing digital environment, that is a task for future research and continuing examination.

To more greatly emphasize the potential influence of internal and external factors, the results show that system issues were more important from the perspective of the teachers than the teacher issues. According to previous studies (e.g., Dawson & Rakes, 2003; Georgina & Hosford, 2009; Kupetz & Ziegenmeyer, 2005), teacher training with technologies is encouraged by organizations and educators all over the world including

Thailand (Office of Basic Education Commission, n.d.). However, the results of this study provide us with an awareness of a missed focus. Having more teacher training alone may not be sufficient to help teachers improve their teaching performance or promote the interactions of learners. In contrast, focusing on providing technology devices and resources needed by schools could be more effective for the teachers' development rather than solely focusing on required and repeated teacher training.

Regarding the facilities in classrooms, Kahoot is a technological tool that requires computers, projectors, speakers, and Wi-Fi. Therefore, one can conclude that facilities have a huge impact on what teachers can introduce and integrate in terms of technology in their classrooms. The results from this study are consistent with the results of Nim Park and Son's (2009) study, which stated that inadequate time, insufficient computer facilities, inflexible school curricula and textbooks, lack of administrative support, teachers' limited computer skills, and teachers' perceptions of CALL could all affect the use of technology in the classroom. Also, it can be seen that the teachers in this study were concerned more with external factors, such as facilities, learners' readiness, and preparation time, than internal factors. Therefore, the school should play an important role in supporting the use of technology, for example, by allowing teachers more preparation time, assigning smaller workloads, and hiring teacher assistants to help the teachers in the classroom.

Regarding the analysis of teacher use and perceptions of technological applications, it was found that while the teachers used social media tools in their daily lives, they used technological tools for teaching in classes. The teachers mostly used free game-based learning, for instance, Quizizz, Kahoot, Padlet, and Plickers. These tools are easy-to-use, free, and support a classroom learning environment and classroom engagement. Interestingly, in this study, Kahoot was used the most in the teachers' Thai EFL classrooms. It can be assumed that Kahoot comprised more attractive educational features compared to the other tools (e.g., Padlet and Quizizz) for the teachers. Kahoot supports students in playing together and incorporates game show features, such as background music, time-constraints in providing answers, a point awarding system, and a leaderboard (Cárdenas-Moncada et al., 2020). In addition, the features of Kahoot mostly match the characteristics of gamification tools in a way that most games contain rules, goals and objectives, outcome and feedback, conflict or competition, challenge and opposition, interaction, and the representation of a story (Prensky, 2001a).

## **Conclusion**

In summation, this study helps to broaden our knowledge of technology use in secondary education contexts since most studies in ELT heavily focus on higher education contexts (Bado & Franklin, 2014; Chaiyo & Nokham, 2017; Dellos, 2015; DeWitt et al., 2015; Hwang et al., 2016; Putri, 2019; Reinders & Wattana, 2015; Shahriarpour & Kafi, 2014; Wong et al., 2015). Additionally, in Thailand, studies regarding technology have mainly been conducted based on participants in urban areas

(Wiangsima & Boonmoh, 2018). Surin is a smaller province located far from the national capital. Therefore, the present study also broadens our knowledge of technology use and perceptions of teachers in rural areas.

The teachers in this present study seemed willing, ready, and eager to prepare themselves for integrating technology into their classes. Most teachers had already used technology through computers and mobile devices. The teachers could see the importance of CALL and MALL since these methods have had a positive influence on EFL classrooms (Almekhlafi, 2006; Baleghizadeh & Oladrostam, 2010; Junjie, 2019; Nim Park & Son, 2009). This study also revealed the use of technology and teachers' perceptions of technology at the secondary level in Surin Province. For further research, given the limited generalizability of any study, we intend to continue our examination on the teachers' use and perceptions of technology integration in EFL classrooms with other schools in additional provinces to get a better understanding and to evaluate the use of technology for teaching English throughout the country. Furthermore, the current study relied solely on questionnaire data, while it lacked more in-depth information. Thus, in further exploration, the researchers plan to investigate how teachers specifically use technology in their classrooms with additional methods and data collection.

## References

- Almekhlafi, A. G. (2006). The effect of computer assisted language learning (CALL) on United Arab Emirates English as a foreign language (EFL) school students' achievement and attitude. *Journal of Interactive Learning Research*, 17(2), 121–142.
- Apps 4 EFL. (n.d.). *181 recommended websites for EFL/ESL teachers and learners*. <https://www.apps4efl.com/sites/>
- Bado, N., & Franklin, T. (2014). Cooperative game-based learning in the English as a foreign language classroom. *Issues and Trends in Educational Technology*, 2(2). [https://doi.org/10.2458/azu\\_itet\\_v2i2\\_bado](https://doi.org/10.2458/azu_itet_v2i2_bado)
- Baleghizadeh, S., & Oladrostam, E. (2010). The effect of mobile assisted language learning (MALL) on grammatical accuracy of EFL students. *Mextesol Journal*, 34(2), 1–10.
- Bordonaro, K. (2003). Perceptions of technology and manifestations of language learner autonomy. *CALL-EJ*, 5(1), 12–28.
- Buasuwat, P. (2018). Rethinking Thai higher education for Thailand 4.0. *Asian Education and Development Studies*, 7(2), 157–173. <https://doi.org/10.1108/AEDS-07-2017-0072>
- Bussi, M., & Khatiwada, S. (2017, April 10). Thailand 4.0 and the future of work. *The Nation Thailand*. <https://www.nationthailand.com/opinion/30311956>

- Cárdenas-Moncada, C., Véliz-Campos, M., & Véliz, L. (2020). Game-based student response systems: The impact of Kahoot in a Chilean vocational higher education EFL Classroom. *CALL-EJ*, 21(1), 64-78.
- Chaiyo, Y., & Nokham, R. (2017, March). The effect of Kahoot, Quizizz and Google Forms on the student's perception in the classrooms response system. In *2017 International Conference on Digital Arts, Media and Technology (ICDAMT)* (pp. 178-182). IEEE. <https://doi.org/10.1109/ICDAMT.2017.7904957>
- Chinnery, G. M. (2006). Going to the MALL: Mobile assisted language learning. *Language Learning & Technology*, 10(1), 9-16.
- Corti, K. (2006). Games-based learning; A serious business application. *Informe de PixelLearning*, 34(6), 1-20.
- Dawson, C., & Rakes, G. C. (2003). The influence of principals' technology training on the integration of technology into schools. *Journal of Research on Technology in Education*, 36(1), 29-49. <https://doi.org/10.1080/15391523.2003.10782401>
- Dellos, R. (2015). Kahoot! A digital game resource for learning. *International Journal of Instructional Technology and Distance Learning*, 12(4), 49-52.
- Deubel, P. (2006). Game on! *T.H.E. Journal (Technological Horizons in Education)*, 33(6), 30-35.
- DeWitt, D., Alias, N., Ibrahim, Z., Shing, N. K., & Rashid, S. M. M. (2015). Design of a learning module for the deaf in a higher education institution using Padlet. *Procedia-Social and Behavioral Sciences*, 176, 220-226. <https://doi.org/10.1016/j.sbspro.2015.01.464>
- Georgina, D. A., & Hosford, C. C. (2009). Higher education faculty perceptions on technology integration and training. *Teaching and Teacher Education*, 25(5), 690-696. <https://doi.org/10.1016/j.tate.2008.11.004>
- Goodyear, P. (2001). *Effective networked learning in higher education: Notes and guidelines*: Centre for Studies in Advanced Learning Technology, Lancaster University.
- Harfield, T., Davies, K., Hede, J., Panko, M., & Kenley, R. (2007). Activity-based teaching for Unitec New Zealand construction students. *Emirates Journal for Engineering Research*, 12(1), 57-63.
- Hwang, G. J., & Wu, P. H. (2012). Advancements and trends in digital game-based learning research: A review of publications in selected journals from 2001 to 2010. *British Journal of Educational Technology*, 43(1), E6-E10. <https://doi.org/10.1111/j.1467-8535.2011.01242.x>
- Hwang, W. Y., Shih, T. K., Ma, Z. H., Shadiev, R., & Chen, S. Y. (2016). Evaluating listening and speaking skills in a mobile game-based learning environment with situational contexts. *Computer Assisted Language Learning*, 29(4), 639-657. <https://doi.org/10.1080/09588221.2015.1016438>

- Icard, S. B. (2014). Educational technology best practices. *International Journal of Instructional Technology and Distance Learning*, 11(3), 37-41.
- Johnson, M., Riel, R., & Germain-Froese, B. (2016). *Connected to learn: Teachers' experiences with networked technologies in the classroom*. Canadian Teachers' Federation.
- Jones, C., & Pimdee, P. (2017). Innovative ideas: Thailand 4.0 and the fourth industrial revolution. *Asian International Journal of Social Sciences*, 17(1), 4-35. <https://doi.org/10.29139/aijss.20170101>
- Kannan, J., & Munday, P. (2018). New Trends in second language learning and teaching through the lens of ICT, networked learning, and artificial intelligence. *Círculo de Lingüística Aplicada a la Comunicación*, 76, 13-30.
- Khamprem, K., & Boonmoh, A. (2019). Teachers' stated needs and their actual use of technology. *Human Behavior, Development and Society*, 20(4), 41-51.
- Khan, M., Muhammad, N., Ahmed, M., Saeed, F., & Khan, S. A. (2012). Impact of activity-based teaching on students' academic achievements in physics at secondary level. *Academic Research International*, 3(1), 146.
- Kukulska-Hulme, A., & Shield, L. (2008). An overview of mobile assisted language learning: From content delivery to supported collaboration and interaction. *ReCALL*, 20(3), 271-289. <https://doi.org/10.1017/S0958344008000335>
- Kupetz, R., & Ziegenmeyer, B. (2005). Blended learning in a teacher training course: Integrated interactive e-learning and contact learning. *ReCALL: The Journal of EUROCALL*, 17(2), 179. <https://doi.org/10.1017/S0958344005000327>
- Levy, M. (1997). *CALL: Context and conceptualisation*. Oxford University Press.
- Martínez-Mesa, J., González-Chica, D. A., Duquia, R. P., Bonamigo, R. R., & Bastos, J. L. (2016). Sampling: How to select participants in my research study? *Anais Brasileiros de Dermatologia*, 91(3), 326-330. <https://doi.org/10.1590/abd1806-4841.20165254>
- Nim Park, C., & Son, J. B. (2009). Implementing computer-assisted language learning in the EFL classroom: Teachers' perceptions and perspectives. *International Journal of Pedagogies and Learning*, 5(2), 80-101. <https://doi.org/10.5172/ijpl.5.2.80>
- Office of Basic Education Commission (n.d.). *Lists of all training programs provided by OBEC*. <http://training.obec.go.th>
- Pennington, L. (2015, March 18). Top 7 useful apps for TEFL educators. *Wandering Educators*. <https://www.wanderingeducators.com/language/learning/top-7-useful-apps-tefl-educators.html>
- Petersen, K., & Sachs, R. (2015). The language classroom in the age of networked learning. In R. P. Leow, L. Cerezo, & M. Baralt (Eds.), *Technology and L2 learning: A psycholinguistic approach*. De Gruyter Mouton.

- Pivec, M. (2007). Play and learn: Potentials of game - based learning. *British Journal of Educational Technology*, 38(3), 387-393. <https://doi.org/10.1111/j.1467-8535.2007.00722.x>
- Prensky, M. (2001a). *Digital game-based learning*. McGraw-Hill.
- Prensky, M. (2001b). Digital natives, digital immigrants. *On the Horizon*, 9(5). 1-6.
- Putri, N. S. (2019). Kahoot application in English language teaching (ELT) context: An alternative learning strategy. *ELSYA: Journal of English Language Studies*, 1(1), 11-15. <https://doi.org/10.31849/elsya.v1i1.2488>
- Reinders, H. (2017). Digital games and second language learning. In S. Thorne & S. May (Eds.), *Language, Education and Technology. Encyclopedia of Language and Education* (3rd ed.). [https://doi.org/10.1007/978-3-319-02237-6\\_26](https://doi.org/10.1007/978-3-319-02237-6_26)
- Reinders, H., & Wattana, S. (2015). Affect and willingness to communicate in digital game-based learning. *ReCALL*, 27(1), 38-57. <https://doi.org/10.1017/S0958344014000226>
- Schmid, E. C. (2009). *Interactive whiteboard technology in the language classroom: Exploring new pedagogical opportunities*. VDM Verlag Dr. Müller.
- Shahriarpour, N. & Kafi, Z. (2014). On the effect of playing digital games on Iranian intermediate EFL learners' motivation toward learning English vocabularies. *Procedia-Social and Behavioral Sciences*, 98, 1738-1743. <https://doi.org/10.1016/j.sbspro.2014.03.601>
- Srisard, B. (2003). *Basic research*. Suweeriyasarn.
- Thailand 4.0: In sight but not in reach. (2017, November 16). *The Economist*. <https://country.eiu.com/article.aspx?articleid=1746126758&Country=Thailand&topic=Economy>.
- Wiangsima, A., & Boonmoh, A. (2018). Teachers' perceptions for teaching English in the near future. *Journal of Liberal Arts, Ubon Ratchathani University*, 14(2), 270-310.
- Wittayasin, S. (2017). Education challenges to Thailand 4.0. *International Journal of Integrated Education and Development*, 2(2), 29-35.
- Wong, S. Y., Tee, W. J., & Jasman, M. A. B. (2015). 2D Side-scrolling game: Applying motivation and digital game-based learning (DGBL) in English learning. In S. Tang & L. Logonathan (Eds.), *Taylor's 7th Teaching and Learning Conference 2014 Proceedings* (pp. 349-358). Singapore. [https://link.springer.com/chapter/10.1007/978-981-287-399-6\\_32](https://link.springer.com/chapter/10.1007/978-981-287-399-6_32)
- Wu, J. G. (2019). The use of mobile devices in language learning: A survey on Chinese university learners' experiences. *CALL-EJ*, 20(3), 6-20. <http://callej.org/journal/20-3/Wu2019.pdf>
- Yang, D. F. (2007). *Improving networked learning in higher education: Language functions and design patterns* (Accession No. 2465) [Doctoral dissertation, University of Sydney]. Sydney eScholarship Repository.

Zin, N. A. M., Jaafar, A., & Yue, W. S. (2009). Digital game-based learning (DGBL) model and development methodology for teaching history. *WSEAS Transactions on Computers*, 8(2), 322-333.