Factors Influencing Thai EFL Teachers' Acceptance of Technology: A Qualitative Approach

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Abstract

Although there is an abundance of quantitative studies on teachers' technology acceptance, qualitative research on this topic is sparse, especially in the Thai context. This study thus set out to explore the acceptance of technology among Thai EFL university teachers. The study adopted the Technology Acceptance Model (TAM) as the basis for its framework, and in-depth interviews were employed to collect qualitative data from eight participants. The analysis of the interview data revealed that the teachers' behavioral intentions to use technology (BI) were influenced by six factors: perceived usefulness (PU), perceived ease of use (PEU), attitude towards use (ATT), subjective norm (SN), facilitating conditions (FC), and familiarity with technology. This study provides insights into the determiners of technology acceptance among Thai EFL university teachers, which are critical to the promotion of technology integration in this country.

Keywords: technology acceptance, TAM, intention to use technology, Thai EFL teachers

Introduction

Technology has become an integral part of 21st century language classrooms. In addition to common hardware tools like computers, projectors, and visualizers, there is a multitude of recently developed software such as Internet-based applications (Ulla, Perales, & Tarrayo, 2020), social media (Manca, 2020), and learning management systems (Hinkelman, 2018) that teachers can integrate into their classrooms to enhance students' learning. The positive effects of technology integration have been revealed in many studies. With the help of technology, learners could improve their oral proficiency (Wu, Chen Hsieh, & Yang, 2017), learn vocabulary vicariously (Çetinkaya & Sütçü, 2018), and become more motivated and autonomous (Ghufron & Nurdianingsih, 2019).

Although technologies offer potential for promoting learning and improving language skills, students cannot gain these benefits if teachers do not integrate technology into their instruction. There is evidence that despite teachers' positive attitude towards technology, it is still not extensively used (Zyad, 2016). To find out what prevents teachers from implementing technology, researchers have been exploring factors influencing teachers' technology integration. In the past decades, they have examined its relationship with different factors, for

example, teachers' reasoning (Heitink et al., 2016), pedagogical beliefs (Tondeur, et al., 2017), and technological pedagogical content knowledge (TPACK) (Hsu, 2016). Unlike these studies, the present study will explore this relationship through the lens of technology acceptance, defined by Teo (2016) as "a person's willingness to employ technology for the tasks it is designed to support" (p. 746).

Technology acceptance is a construct employed to predict people's intention to use and their subsequent actual use of technology through a set of distinct but closely related attitudes and beliefs (Scherer, Siddiq, & Tondeur, 2020) such as perceived usefulness (PU), perceived ease of use (PEU), and attitude towards behavior (ATT) (Davis et al., 1989). Technology acceptance first attracted the attention of researchers in the field of computer and information technology who sought to understand why some people accepted computers while others did not (Davis et al., 1989), and since technology permeated into classrooms, it has also been extensively studied in educational contexts (Marangunić & Granić, 2015). In the past decades, there has been a plethora of quantitative studies on teachers' technology acceptance in which the relationships among different constructs of attitudes and beliefs as well as their relationships with usage intentions or actual use have been hypothesized and tested, using the structural equation modelling (SEM) approach and path analysis (Scherer & Teo, 2019).

Without any doubt, these quantitative studies shed light on diverse factors which prompt teachers' intention to use technology, such as perceived usefulness (PU) and facilitating conditions (FC) (Wong, 2016). However, some researchers have identified gaps in the literature of technology acceptance by pointing out that the results gained from the quantitative research alone may not be sufficient to explain the highly complex nature of teachers' technology adoption and have contended that qualitative research is needed to make the existing literature more comprehensive. In this regard, Li (2014) asserted that teachers' adoption of technology is so complex and encompasses so many different influencing factors that it cannot simply be categorized into 'external or internal' factors, or with regard to 'usefulness' or 'ease of use'. The rich qualitative data she collected from her interviews with eight secondary school English teachers backed this claim. Also, in support of this argument, Teo, Huang, and Hoi (2018) suggested that to gain deeper insights into practical issues, beliefs, and perceptions of determinants of technology acceptance among teachers, qualitative studies should be conducted.

In comparison with the large number of quantitative studies, the qualitative research devoted to this topic is sparse, especially in the Thai context. To the researcher's best knowledge, there is no qualitative research that investigates technology acceptance among EFL university teachers in Thailand. This qualitative research is therefore a pioneering study that delves into the factors that influence Thai EFL university teachers' intentions to use technology. It will contribute to the current literature on technology acceptance by deepening understanding of the diverse determiners that govern the technology usage intentions of teachers in the local context of Thailand, which are likely to be different from those found in other settings. It will also provide educational leaders and policy makers with empirical information that can be used as a basis for developing policies to reduce technology adoption barriers among teachers and promote technology integration in language classrooms.

Literature Review

Technology Acceptance Theories and Models

Among the diverse technology acceptance theories and models, the Technology Acceptance Model (TAM) is an influential model that has been applied and validated in diverse fields of studies (Marangunić & Granić, 2015). TAM was introduced by Davis (1986), who developed this model based on the Theory of Reasoned Action (TRA), a widely studied theory in social psychology designed to explain and predict human behavior and attitudes (Marangunić & Granić, 2015). Unlike TRA, which is very broad in scope as its aim is to provide explanations for any consciously intended human behavior, TAM was formulated to specifically explain user acceptance of computer-based information systems (Davis et al., 1989). TAM stipulates the influence of attitude towards use (ATT) and two beliefs, namely perceived usefulness (PU) and perceived ease of use (PEU), on behavioral intention to use (BI), which is a predictor of actual use (USE) of a system. PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance," while PEU refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). Fishbein and Ajzen (1975) defined ATT as an individual's positive or negative feelings about performing the target behavior and referred to BI as a determinant of one's intention to perform the behavior in question. In this model, ATT, PU, PEU, and BI are interrelated. BI is determined by ATT and PU. ATT is directly influenced by the two beliefs, PU and PEU. Between these two beliefs, PU is also affected by PEU. The relationships among these variables are presented in Figure 1.

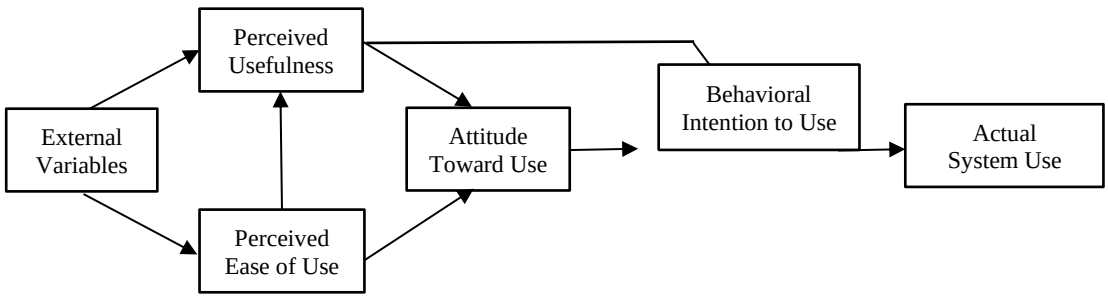

Figure 1. Technology Acceptance Model (Davis et al., 1989)

Over time, the original TAM (Davis, 1986) has been extended to include other variables that are hypothesized to have effects on users' acceptance of technology. These additions are evident in various models subsequent to the TAM. For example, the extended model of TAM, referred to as TAM2, also incorporates factors that influence perceived usefulness. These are subjective norm, image, job relevance, output quality, and result demonstrability (Venkatesh et al., 2003). Another successor of TAM, the Unified Theory of Acceptance and Use of Technology (UTAUT), includes not only internal variables, namely performance expectancy and effort expectancy which are similar to TAM's perceived usefulness and perceived ease of use respectively, but also two external variables, social influence and facilitating conditions (Venkatesh et al., 2003). In addition to proposing the four

constructs that determine usage intention and actual use, UTAUT also specifies key moderators (i.e. gender, age, experience, and voluntariness of use) and the moderating effects they may have on the four variables.

In summary, many theories and models have emerged because of attempts to identify diverse variables pertaining to users' acceptance of technology, and TAM is a dominant model that has been extensively employed as a theoretical basis for explaining technology acceptance.

Technology Acceptance in Educational Contexts

Technology acceptance has become an important issue in the field of education because schools and universities embody a number of potential users who can reap the benefits of technology if it is incorporated into teaching and learning (Marangunić & Granić, 2015). Among these users, teachers play the most dominant roles in technology integration (Teo, 2011) as they are the ones who decide which technology to adopt, how often to use it, and how much technology to employ when they design the curriculum or deliver their lessons (Teo, 2015).

The acknowledgement of teachers as key decision-makers for technology integration has given rise to a number of large-scale quantitative studies that probe the factors influencing teachers' decisions to integrate technology in their classrooms. According to Scherer et al. (2020), these studies typically focus on examining and validating the relationships among constructs drawn from different technology acceptance theories and models as well as on exploring how these constructs are related to teachers' usage intention or reported actual use. For example, Teo (2011) investigated the intention to use technology of 592 primary and secondary school teachers in Singapore by exploring the relationships among six constructs: PU, PEU, ATT, BI, subjective norm (SN), and facilitating conditions (FC). These were drawn from three different models and theories: the TAM, the UTAUT, and the Theory of Planned Behavior (TPB). In this study, nine hypotheses, such as PU→ATT and SN→PU, were formulated and tested. Most of the hypotheses were supported, except only for SN→BI, which indicated that BI among this group of sample teachers was not influenced by SN, or "the extent to which a teacher believes that factors in the environment influence his or her decision to use technology" (Teo, 2011, p. 2433).

One of the key issues surrounding quantitative studies on teachers' technology acceptance is their diverse findings. For instance, the relationship between SN and PU was not significant in Ma, Andersson, and Streith's (2005) study on intention to use computers among 84 Swedish pre-service teachers. In contrast, Teo, Lee, and Chai (2007) conducted a study on the same topic with 239 pre-service teachers in Singapore and found that SN was a significant determiner of PU for this group of student teachers. Another example is that while PU strongly influenced Chinese university teachers' BI (Teo, Huang, & Hoi, 2018), it did not exert such influence on the BI of Hong Kong school teachers (Wong, 2016).

Researchers have attempted to explain these contradictory results. Among those is Nistor (2014), who proposed that the relationships between acceptance constructs might be moderated by personal variables (e.g. age, gender, and experience with technology) or social variables (e.g. culture). Therefore, these moderators should be taken into consideration when

conducting research on technology acceptance. However, evidence from empirical studies shows that their roles are still inconclusive. For example, Sánchez-Mena et al. (2019) discovered that gender and age had no moderating effects either on university teachers' attitude towards using, or on their intention to use, educational video games. Similarly, Teo and Zhou (2017) found no moderating effects of demographic variables (i.e. age, gender, teaching experience, technology experience, and teaching level) on the technology acceptance among Singaporean school teachers. In opposition to these findings, age negatively moderated the perceived usefulness of ICT in the study of Scherer, Siddiq, and Teo (2015), in which teachers' levels of perceived problems and difficulties in ICT use varied with age.

The inconsistencies in research results suggest that technology acceptance among teachers is context-specific. In other words, teachers who differ in their teaching level (i.e. pre- or in-service), teaching contexts (i.e. primary, secondary, or tertiary education), and teaching locations (e.g. Sweden, China, Hong Kong, or Singapore) may accept technology in varying degrees. Consequently, the efforts to generalize the studies carried out in different contexts may not provide enough information that accurately captures the local context (Wong, 2016). This justifies the urge for more qualitative research, which is known to be able to precisely capture the perspectives of participants in a specific setting (Bogdan & Biklen, 2007).

The Present Study

This study was conducted to fill the existing gap in the technology acceptance literature. That is, there are currently very few qualitative studies on teachers' technology acceptance, and most of them were conducted in China (e.g. Huang, Teo, & Zhou, 2019; Li, 2014). In the Thai context, research on technology acceptance seems to focus mainly on pre-service teachers (e.g. Teo et al., 2014; Teo, Luan, Thammetar, & Chattiwat, 2011; Teo, Ruangrit, Khlaisang, Thammetar, & Sunphakitjumnong, 2014), and scant attention is paid to in-service teachers, especially EFL in-service teachers at the tertiary level. To the researcher's best knowledge, qualitative research on this topic with this group of teachers in this context is still nonexistent. The current study thus aims to provide richer and deeper data which are imperative to a clearer understanding of how university teachers accept technology in the local context of Thailand. To achieve this goal, it will explore the following research question: what are the factors that influence technology acceptance among Thai EFL teachers at a major public university in the central part of Thailand?

Methodology

The Framework of the Study

This study drew upon the Technology Acceptance Model (TAM) as its theoretical framework. Perceived usefulness (PU), perceived ease of use (PEU), and attitude towards use (ATT) of the teacher participants were investigated to determine whether these constructs had any influence on the teachers' behavioral intention to use technology (BI). In addition to PU, PEU, and ATT, subjective norm (SN) was also explored as it proved to be a determinant of BI among university teachers in the previous studies (e.g. Huang, Teo, Sánchez-Prieto, García-Peñalvo, & Olmos-Migueláñez, 2019; Huang, Teo, & Zhou, 2019; Li, 2014). It is important

to note that this study focused only on the teachers' beliefs and attitudes about factors that influenced their decisions to use or not to use technology; it did not examine their actual use of technology in the real classrooms, which requires other data collection methods such as classroom recordings (as in Li, 2014), or classroom observations or log file data (as suggested by Scherer et al., 2020). Given that the purpose of this study was to probe into technology-related perceptions, beliefs, and attitudes of teachers in a specific setting, qualitative methodology, with its ability to elicit people's subjective views shaped by a particular context (Marshall & Rossman, 2006) and its emphasis on descriptive data (e.g. words and quotations) that describe a distinct situation or perspective (Bogdan & Biklen, 2007), became the most appropriate approach.

Setting

The setting where this study was conducted was a language institute at a public university in the central part of Thailand. This university is one of the major universities in the country, with around 20,000 - 30,000 undergraduate students. However, the language institute is relatively small, when compared with the number of students it has to serve. It has around 60 full-time faculty members. The institute is mainly responsible for providing English courses to undergraduate students across the university. Most of the courses provided are English for Academic Purposes (EAP) courses which are specifically tailored to students of each field of study. On a regular teaching basis, the teachers of the institute travel to different faculties and buildings in the campus to deliver their lessons. In terms of technology availability, the majority of the classrooms are equipped not only with hardware devices like computers, projectors, and visualizers, but also with software programs like Microsoft Office. The Internet connection is also readily accessible and relatively stable. Technology availability, although not probably an issue in this university, does not guarantee technology adoption or integration since there are many more factors coming into play. This study thus sets out to explore what those influencing factors are.

Participants

Eight full-time, in-service, Thai EFL teachers currently working for the institute were purposely selected to participate in the present study. This qualitative approach method, which is naturally rich in data, usually involves a small number of participants to ensure that the data obtained are in a manageable amount. The participant numbers of the previous studies on teachers' technology adoption or acceptance were also small, ranging from 6-14 teachers (Huang, Teo, & Zhou, 2019; Li & Ni, 2014; Tondeur et al., 2013).

In selecting the participants, the key criterion was diversity as participants in qualitative research should "represent a variety of positions in relation to the research topic, of a kind that might be expected to throw light on meaningful differences in experience" (King et al., 2019, p. 57). The participants were selected based on their gender, age, academic title, and teaching experience. Two of them were male, and the other six were female, with ages ranging from 20s to 50s. The participants included four Lecturers, three Assistant Professors, and one Associate Professor, with a wide range of teaching experiences from one to 35 years. Their personal details are presented in Table 1. Pseudonyms and age ranges, instead of specific

ages, were used to preserve the participants' identity and anonymity. The selected teachers, who were diverse in their personal and professional backgrounds, were approached and provided with the details of the research purpose and procedure as well as the measures put in place to protect their rights, anonymity, and confidentiality. After each of them had agreed to participate in the study and given consent, an interview was scheduled and conducted.

Table 1
Details about the participants

Pseudonym	Gender	Age	Academic Title	Teaching Experience
Apasara	Female	50s	Lecturer	35 years
Chatchada	Female	50s	Assistant Professor	22 years
Kamala	Female	40s	Associate Professor	11 years
Lawan	Female	40s	Assistant Professor	17 years
Narong	Male	40s	Lecturer	3 years
Phailin	Female	30s	Assistant Professor	11 years
Rattanaporn	Female	20s	Lecturer	2.5 years
Thinnakorn	Male	20s	Lecturer	1 year

Instrument

The instrument used in the present study was the interview protocol (see Appendix). The protocol consisted of 15 questions, most of which were adopted from those developed previously and used by Huang, Teo, and Zhou (2019), who conducted a similar study with Chinese EFL university teachers. Only one question in the original protocol was adapted to suit the local context of Thailand. The question was *How familiar are you with CECR 2017 and other technology-related policies in China?*, and it was changed to *Do you know any technology-related policies in Thailand?* In addition to this, three questions were added: 1) *Do you know any technology-related policies in this institute or this university?*, 2) *Do you find it easy or difficult to use technology in your teaching?*, and 3) *Apart from what we have discussed so far, are there any other factors that influence your decisions to use or not to use technology in your teaching?* Before the interview protocol was implemented in this study, it was validated and approved by three experts who were chosen based on their years of teaching and experiences in conducting qualitative research.

Data Collection

To collect qualitative data, a semi-structured in-depth interview was conducted individually with each participant, following the interview protocol. Apart from the protocol questions, some additional impromptu questions were asked during the interview when the researcher felt that further clarification was needed from the interviewee. Since technology is rather broad in meaning, the definition of the term was explained at the beginning of the interview to make sure that the interviewee understood it clearly before they responded to the questions. In this study, technology was defined as "all technologies available for use in

teaching and learning including computers, multimedia, the Internet, or any other electronic or interactive media" (Deerajviset, 2014, p. 74).

All the questions in the interview protocol were in English. The interviews were also conducted in English, but the participants were permitted to answer in English or Thai, depending on their preferences. They could also switch between both languages if they wished. Three of the participants chose to answer in English, while four of them shared their responses in Thai. Only one participant used both languages during the interview. For clarification, it should be noted that the participants in this study were EFL university teachers who were proficient in the English language, and their jobs usually required them to use English on a daily basis either in preparing and delivering lessons, giving academic presentations, or communicating with Thai and foreign coworkers. Because of this, the researcher was certain that an English interview was not alien to them and that they were able to understand the protocol and the questions without any difficulties. However, to ensure participants' comprehension of the interview questions, at the beginning of the interview, the researcher explicitly stated that they were encouraged to ask the researcher to clarify if they found any questions unclear.

In terms of the interview methods, the participants were allowed to choose between a face-to-face interview (with audio recording) or an online interview via the Zoom application (with video recording, but with their video camera turned off to protect their anonymity). Due to the COVID-19 pandemic situation occurring during the data collection period, the researcher believed some participants might not feel comfortable or safe to join a face-to-face interview, so an online interview was offered to them as an option. One participant opted for a face-to-face interview, while the rest chose online interviews via the video conferencing application. All the interviews lasted approximately from 30 to 40 minutes.

Data Analysis

The interview data were transcribed word for word, and then each transcript was analyzed based on the thematic analysis proposed by King et al. (2019). The thematic analysis consists of three stages: descriptive coding, interpretive coding, and overarching themes. Each stage involves different steps explained in Figure 2. For quality checks at each stage of the data analysis, King et al. (2019) recommends that independent coding be used. The independent coding consists of two approaches. The first one is the code-confirming approach. When this approach is adopted, the second coder is asked to critically evaluate the transcripts and the codes created by the first coder. The other approach is the code-defining approach. Using this approach, the first and the second coders independently analyze the data at the chosen stage and then conduct a meeting to compare and have a critical discussion about the coding they have come up with. According to King et al. (2019), using different approaches at different stages is acceptable. In this study, both code-confirming and code-defining approaches were used in different stages to ensure the reliability of the coding.

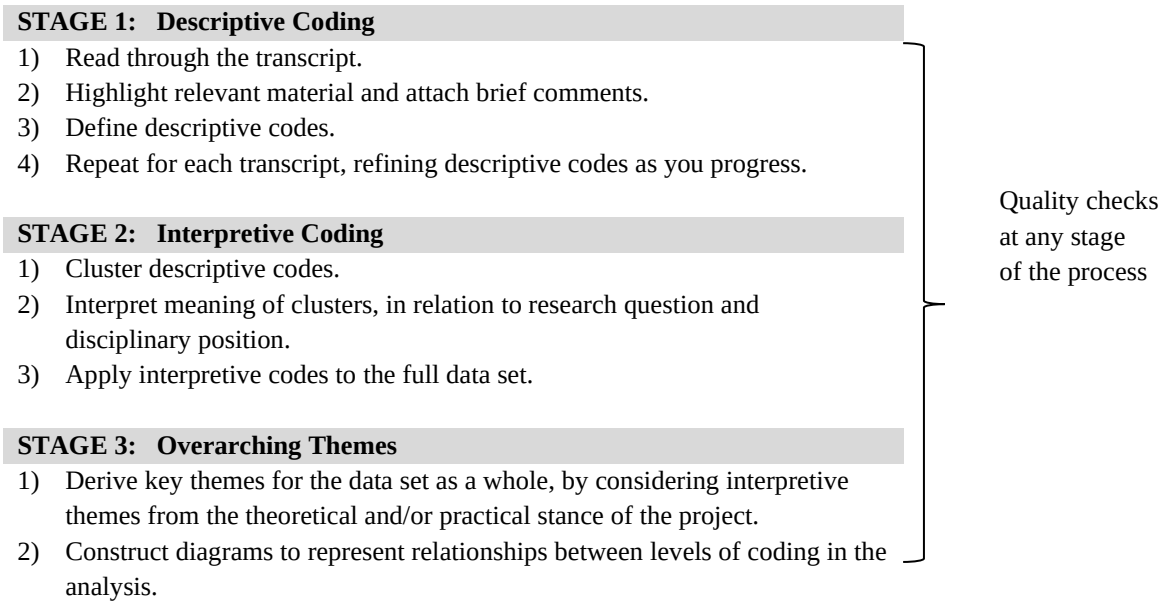

Figure 2. Stages in the Process of Thematic Analysis (King et al., 2019, p. 204)

Stage 1: Descriptive Coding

In this stage, the researcher adopted the role of the first coder and read through all the transcripts. While reading, the first coder highlighted all the statements relevant to the factors that influenced each teacher's intention to use technology, and then wrote a brief comment on the margin of the paper, such as *not afraid to try new technology*, *technology not difficult but take time, make students interested in the lessons,* and *learn about technology a lot from colleagues*. After that, descriptive codes were defined. Some of the examples were *positive about trying and learning*, *engage students*, and *influenced by colleagues*. These codes were also consistently refined, while the first coder was going through this stage. In the final step of this stage, the second coder, who had experience in qualitative research and in analyzing interview data, was recruited to critically scrutinize all of the highlighted statements and the descriptive codes created by the first coder. The disagreements that arose were resolved through discussion between the first and the second coders.

Stage 2: Interpretive Coding

A code-defining approach was used in this stage; therefore, the two coders, first of all, independently grouped descriptive codes they thought share some similarities and then came up with the interpretive codes. After that, meetings were held between the coders to compare and finalize the interpretive codes.

Stage 3: Overarching Theme

This stage began with a discussion between the two coders, who worked together to define the overarching themes. Two themes emerged from the discussion: driving factors and deterring factors. Both coders agreed that, based on the analysis of the data, these two factors strongly influenced the teacher participants' intention to use or not to use technology in their

classrooms. After the themes had been finalized, two diagrams were created to illustrate the two levels of coding (i.e. descriptive and interpretive coding) under each theme (see Figures 4 and 5).

In the final step of the data analysis, the extracts selected for use in this research article were translated into English (if they were originally in Thai) by the researcher. To ensure the accuracy of the translation, another experienced researcher with strong proficiency in both Thai and English was recruited to check the translation. The translated statements were also double checked by the first and the second coders to ensure that their meanings were the same as the original.

Transcript Examples	Descriptive Codes	Interpretive Codes	Overarching Themes
Most of the time, I use videos to draw students' attention. I use YouTube video clips to introduce the lessons. Because the lessons are normally quite dry, I need them to attract students' interests. (Apasara, 50s)	➔ Interest students	➔ Benefits	➔ Driving factors
I use applications or Kahoot when there is a Q&A in my class or when we do something fun, which is not part of the assessment. I want to make students more engaged in my class. (Thinnakorn, 20s)	➔ Engage students		
I'm concerned about my colleagues. Sometimes, I need to ask them if they are comfortable with this technological tool. Sometimes, not everybody is OK with using it. So I don't have concerns about the students but I'm concerned about the people I work with. (Phailin, 30s)	➔ Concerned about colleagues	➔ Concerns about other people	➔ Deterring factors
The worry is about students. I think that the lack of devices that allow them to use technology will become my biggest concerns. Because students might not feel comfortable if they find they don't have that, or their devices would not be ready for use in class. (Rattanaporn, 20s)	➔ Concerned about students		

Figure 3. Example of the Coding Process

Results

The thematic analysis of the interview data showed that the intentions to use technology among the Thai EFL university teachers in this study were influenced by two major factors: driving factors and deterring factors, each of which will be discussed in this section.

1. Driving Factors

Six factors, including the benefits, easiness, positive attitudes, influence of others, available resources, and familiarity, were found to be the driving factors encouraging the teachers to use technology in their classrooms. These factors are presented in Figure 4.

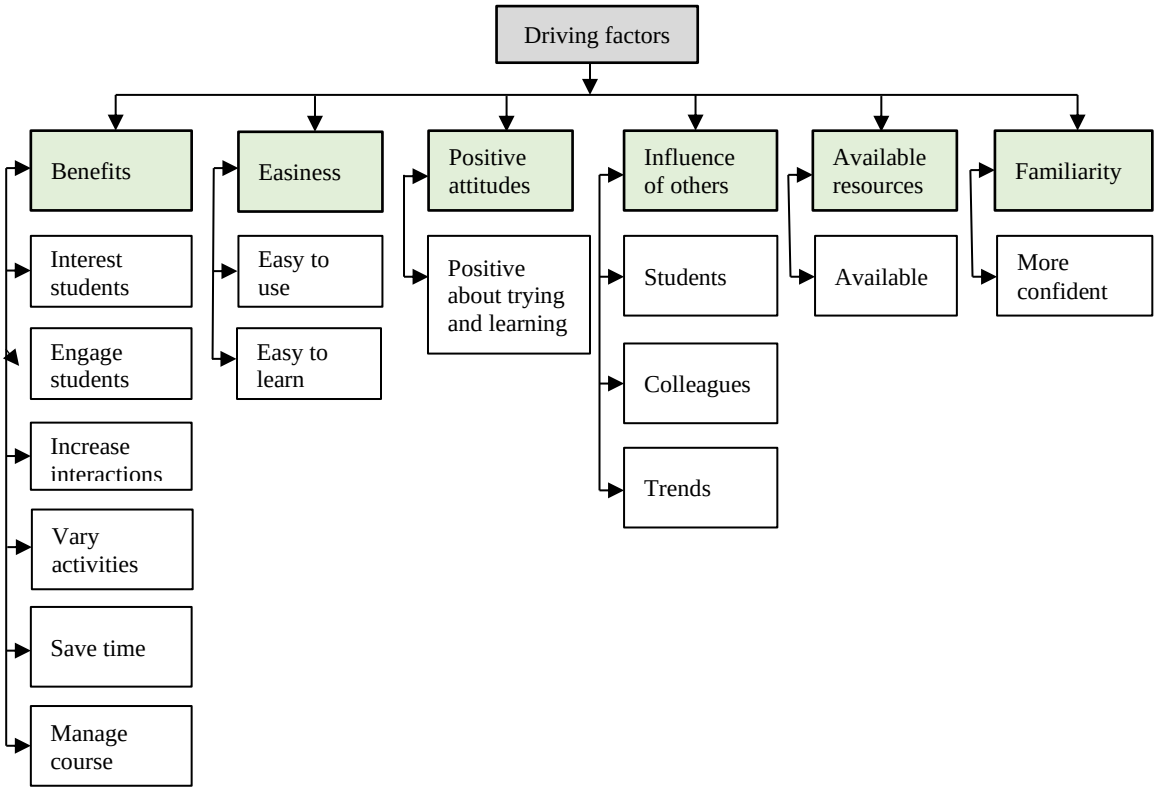

Figure 4. Driving Factors

The first, and most important, factors were the perceived benefits of technology. All the teachers agreed that technology provided substantial benefits to teaching and learning. They believed, as shown in their quotes below, that technology could make their students interested and engaged in the lessons and class activities and could increase their interactions.

> If we teach the same class and use the same activities, learners will get bored. So, I try to use something new and interesting, like technology, applications, or Kahoot. (Thinnakorn, 20s)

> My number-one priority is to make the class fun and engaging. I don't want them to listen to only me speaking, so I use video clips like Ted Talk because they have interesting presentations. (Phailin, 30s)

> Sometimes, when we ask the students if they can write this sentence, they won't answer or speak to us. But if we try using the Google Docs and tell them to collaboratively write the sentences, they will do it. (Chatchada, 50s)

For the teachers themselves, they thought technology allowed them to use various activities in classes, helped them save time for making and grading exams, and facilitated course management. Two instructors explained these benefits as follows:

> I can have more varieties of activities in the classroom, like when I teach writing, I can bring many kinds of activities and more interesting activities to class, like let them write together at the same time, or pointing at the errors together. (Lawan, 40s)

> It helps save time for making exams and grading. For example, when we use Google Forms – it helps a lot. I don't have to check against the rosters. Everything is automatic and, ta-dah, it's there. (Lawan, 40s)

> The main reason why I use the LMS is to use it when announcing the scores. We upload the scores and they will be automatically sent to all of the students. This makes our lives much easier, and that's why I use it continually. (Phailin, 30s)

Another influencing factor was easiness. Two teachers, Chatchada and Narong, asserted that their decisions to use technology were in part determined by how easy or difficult a particular technological tool was. Tools that were easy to use or those that did not take much time to learn could prompt their usage intentions.

> Another factor that influenced my decision to use technology is it must be user-friendly. It must have ease of use. Any tool that is easy to use and not complicated would be my first choice. (Chatchada, 50s)

> I'm interested in using new technologies that are not too complicated. I'm willing to try using the technologies that I can learn in a short period of time. (Narong, 40s)

However, not all the teachers deemed easiness essential. One teacher, Rattanaporn, asserted that although using technology might be challenging or difficult, she was willing to integrate it into her classrooms if it yielded positive results (i.e. making her class more interesting and helping students learn better). This suggests that, for some teachers, their perceived usefulness (PU) asserts stronger influence on their intentions (BI) than their perceived ease of use (PEU).

Regarding the attitudes towards technology (ATT) among the eight participants, only Chatchada and Phailin seemed to naturally think highly of technology as they talked about their willingness to try and learn technology throughout the interviews. According to Chatchada, although she had to "struggle a lot with new technologies", she still held a positive attitude towards it, as she believed it was important to her career and she had to "catch up with it". Similarly, Phailin's favorable attitude towards technology is shown in her excerpt below.

> I'm not afraid to try new technologies. If I've heard that they work well, I'm willing to try and learn them. (Phailin, 30s)

Apart from Chatchada and Phailin, the other participants, interestingly, held an unfavorable view on technology at first but later felt more positive about it after they had direct experience in using it and derived its benefits. Lawan's quote below reflects this change in attitudes.

> Like this is the first semester that I learned doing things on Google Form, and I found that it actually facilitates teaching a lot, from grading, from checking, from everything. I think I'm happy learning new technology. (Lawan, 40s)

Two conclusions can be made with respect to the participants' attitudes towards technology. First, the participants' PU strongly influenced their ATT. Once the teachers perceived, through their own experience, that technology was beneficial to them and their students, they would develop a positive, or a more positive, attitude towards technology. Second, their ATT did not vary with age. If age was a factor, teachers who were older would be more resistant to technology than younger ones. However, this was not supported by the interview results of this study since Chatchada, who was in her 50s, was found to have a more positive attitude than the other younger participants. In addition, the youngest teachers like Rattanaporn and Thinnakorn, who were in their 20s, were not found to have a more positive attitude towards technology than their older counterparts.

In addition to the internal factors (i.e. beliefs and attitudes towards the technology itself), external factors, namely the students, colleagues, trends, and available resources also influenced the participants' intentions to use technology.

In terms of the influence of others, the teachers attributed their decisions to use technology mainly to the students, as illustrated in the excerpts of Rattanaporn and Lawan below. Both teachers recognized the changing needs and learning styles of Generation Z students who heavily relied on technology, so they adapted their teaching accordingly.

> Well, I think the drive for me which is very obvious is the students. I mean the changing generation of students. I feel that traditional classes might be boring for students. So, I think the use of technology will help in making classes more interesting and students may feel up-to-date when studying. So, I think my number one drive would be my students. (Rattanaporn, 20s)

> I need to include technology like media and also things online like games in Kahoot or Mentimeter to make my lessons more interesting – that is the first point – to motivate students more, because as you know Generation Z, they are more interested in technology and they want to take action fast and learn new things, so technology allows them more room to participate in the class. (Lawan, 40s)

Colleagues were also the driving factors for most participants. According to Narong, for instance, he felt that, sometimes, adopting technology was not an option but a necessity. He explained that when the course coordinator chose a particular technological platform as a place for all the teachers who taught the same course to share course materials, other teachers were automatically required to learn how to use the technology. Nevertheless, unlike Narong,

some of the participants viewed their colleagues as a source of inspiration to use technology as illustrated in the following excerpt of Lawan.

> For my colleagues, when I know that other Ajarns used technology, and then they told me that technology can help or allow them to do – like to make a lesson more interesting. I'm quite interested, and I want to learn that kind of technology. (Lawan, 40s)

Another external driving factor is the trends, or the technology or technology-based teaching approach believed by teachers to be contemporarily trendy or popular. In fact, it has not been previously reported that trends are also an influencing factor of teachers' usage intentions. Chatchada and Phailin, who naturally held a positive attitude towards technology, also regarded the trends (see their quotes below) as a factor that influenced their intentions to integrate technology into their classes.

> I've tried to use everything that they said is trendy - use education tools that are trendy each year. For example, three years ago, Kahoot was popular, so I tried to use it. Last year, Mentimeter was the trend, so I used it. This year, they said that Kahoot, Mentimeter, and Padlet are in trend and that the premium versions are better because they have more features, so I bought them. (Chatchada, 50s)

> When the Flipped Classroom is a trend – in the past we usually taught in class and played video clips in the classrooms, but this time we assign them to watch the videos or do this and that outside of class. (Phailin, 30s)

Thanks to their interest in technology, they may often seek new technologies to use, and one way to do this is to explore what other teachers are using. This probably explains why their BI is also influenced by these trends.

Available resources were also an external factor discussed by half of the participants. They pointed out that there are currently a number of applications available for them to use; however, they were likely to use those that were supported, or paid, by the institute. Thinnakorn's excerpt illustrates this point very clearly.

> Another thing is many applications are not free. Let's say, for example, if the institute supports a particular technology and they subscribe to it, we can use many features, and this prompts us to use this technology. (Thinnakorn, 20s)

The last driving factor was familiarity with technology. The participants in this study revealed that once they became familiar with technology, they would feel more confident about it. (See Rattanaporn's quote below.) It is evident that, like PU, familiarity with technology could influence the participants' attitudes toward it, which would in turn influence their intentions to use technology.

> It's quite difficult to use technology in class. However, by the time that I feel familiar with it and I could cope with a new technology, I think it's quite convenient and easy for the class and students too. (Rattanaporn, 20s)

2. Deterring Factors

The deterring factors, or those that made the participants reluctant to integrate technology into their teaching, were complexity, negative attitudes, unavailable resources, concerns about other people, and unfamiliarity, all of which are shown in Figure 5.

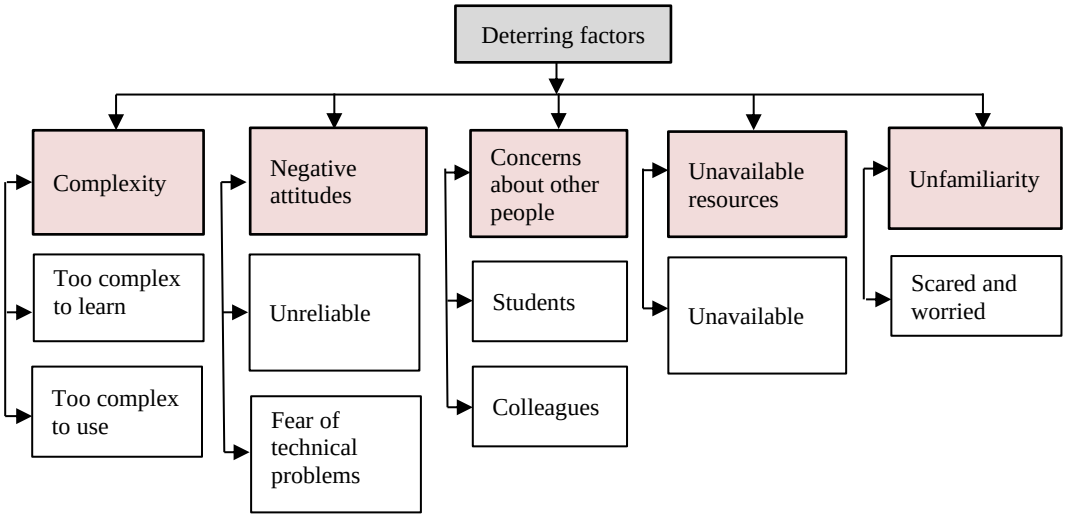

Figure 5. Deterring Factors

The participants put forward a number of factors that prevented them from deciding to adopt technology into their teaching. The first one involved the complexity of technology. Technologies that are too complex to learn or to use could scare the teachers away. This is particularly true for Lawan, who said, "there are times that I choose not to use a new technology in my class because I worry that it is going to be too complicated for me to learn, and I am scared of things that are so new to me". Another participant, Rattanaporn, also shared the concern about technology complexity as follows:

> Things that are going to make me stop using technology in class would be the difficulty of using the technology, so if it is too complex for me and I feel that I couldn't cope with it in class or even in the stage of preparation, I think I would actually go with the traditional style that I used to do. (Rattanaporn, 20s)

Another deterring factor was the negative attitudes the teachers had towards technology, which resulted from their beliefs that technology was not always reliable and from their fear of technical problems that might occur. Thinnakorn expressed his frustration about the unreliability of technology, while Kamala explained her distaste for the uncontrollable aspects of technology in the excerpts below.

> But if I have a choice, I feel like I don't want to use technology. The main reason is sometimes I feel it is not reliable. In some situations, we have already had a plan, but technology prevents it from happening. When things don't go my way, I feel a bit frustrated. That's why I don't like to depend on technology. (Thinnakorn, 20s)

> I don't enjoy using technology much actually, because like I cannot control any technological stuff, especially when a problem exists like when the slide doesn't show as I expected, or some technical delay, things like that. Anything that I cannot control, I don't like it. (Kamala, 40s)

Other people, including their students and colleagues, also caused concerns and hesitance about the use of technology among the participants. According to Rattanaporn, she was worried that her students might not have the technological devices required for participating in some class activities, so "they might not feel comfortable". This made her think twice before implementing any activity which involved the use of these tools. Phailin, on the other hand, did not express her concerns about the students as she believed they were digital natives who were proficient in using technology. Her concern was mainly about the teachers, or the colleagues she was working with as she was aware that some of them were not comfortable with using technology.

The fourth factor that made the participants hesitant about using technology was the unavailability of resources. According to Chatchada, for example, she did not have concerns about herself using technology because she always tried her best. However, she was concerned about the equipment support, saying, "I want more tools – better tools". Another participant, Rattanaporn, also pointed out, "it would be very challenging for teachers to adopt digital technology in their teaching if the institute does not provide access to different technology or access to resources".

The last deterring factor which has not been previously reported in the literature was unfamiliarity, which made the teachers scared and worried about using technology. Among the eight participants, six of them expressed concerns about the unfamiliar. In the interview, Lawan recalled the experience of using Blackboard Ultra for the first time, saying, "I was scared of the interface that I'm not used to". Narong also talked about his experience of using this platform as follows:

> In the first place, I didn't know what Blackboard is. I've heard about it, and I feel it is something strange. I don't have the courage to use it and I'm worried. (Narong, 40s)

Discussion

The present study employed the Technology Acceptance Model (TAM) as its theoretical framework, and its results supported the validity of TAM in determining the factors that influence teachers' technology acceptance in the local context of Thailand. The four belief and attitude constructs investigated in this study, namely perceived usefulness (PU), perceived ease of use (PEU), attitudes towards use (ATT), and subjective norm (SN), were found to influence the intentions to use technology (BI) among the eight participants, all of whom were Thai EFL teachers of a language institute in a major university in Thailand. Apart from these

four constructs in the theoretical framework, two additional factors emerged from the interview data. It was discovered that the participants' technology acceptance was also influenced by facilitating conditions (FC) and familiarity with technology. The six constructs found in the study are presented in Table 2, and each of them will be discussed below.

Table 2
Results and the framework of the study

	Constructs	Driving Factors	Deterring Factors
In the framework of this study	Perceived Usefulness (PU)	Benefits	-
	Perceived Ease of Use (PEU)	Easiness	Complexity
	Attitudes towards Use (ATT)	Positive attitudes	Negative attitudes
	Subjective Norm (SN)	Other people (students, colleagues, trends)	Other people (students, colleagues)
Outside the framework of this study	Facilitating Conditions (FC)	Available resources	Unavailable resources
	Familiarity	Familiarity	Unfamiliarity

The first construct was perceived usefulness (PU), which asserted the strongest influence on the participants' behavioral intentions to use technology (BI) in both direct and indirect ways. With respect to its direct influence, the eight teachers unanimously agreed that they considered using technology in their classes mainly because it provided benefits to both teachers and students. Their perceived usefulness of technology corroborates with that of the teachers in Kueasnou and Dumlao's (2020) study. Furthermore, some of the technological benefits they perceived concurred with the benefits reported in previous research, including the ability of technology to engage students (Hwang & Wang, 2016; Rashid & Asghar, 2017), increase their interactions (Alshardan, Mendoza, Chang, & Sinnott, 2019; Said, Yahaya, Abdullah, Atan, & Zaid, 2016), and save time (Huang, Teo, & Zhou, 2019). In addition to its direct influence on BI, PU was also found to influence BI indirectly through its influence on ATT. This supported the relationships among PU, ATT, and BI in the TAM. The analysis of the interview data revealed that some of the teachers perceived the advantages of technology through their direct experience and subsequently had a positive attitude towards it, which in turn prompted their usage intentions. The relationships between these three constructs can be visualized as PU→ATT→ BI.

As for perceived ease of use (PEU), technologies that are easy to learn or use were preferred by the participants in this study, while those that are too complex were found to be a hindrance to their BI. This relationship between PEU and BI was also supported in Joo, Park, and Lim's (2018) study, which investigated the technology acceptance among Korean pre-service teachers. Apart from the PEU→BI relationship, some of the interview data also suggest that PU can override PEU. According to one of the participants, she did not mind the difficulties that came with technology if it was truly advantageous to her teaching and students.

This is consistent with Wong's (2016) study, in which PEU was found to have a weak influence on BI.

In terms of attitude towards use (ATT), three interesting observations can be made. First, some people, regardless of their age, might be inherently inclined to have a more positive attitude towards technology than others. This was concluded based on the two teachers, with around 20-year age gap, who were found to naturally hold positive attitudes towards technology. Interestingly, they could still maintain their positive attitudes despite the difficulties they experienced. It must be noted, however, that this conclusion is still far from being conclusive, and more empirical evidence is needed. Second, ATT is strongly influenced by PU. In this study, the majority of the teachers felt negative about technology at first, but after they had enjoyed its benefits, their attitudes became more positive. The strong relationships between PU and ATT were also observed in many previous studies (Sánchez-Mena et al., 2019; Teo, 2011; Teo, 2016; Teo et al., 2018). Third, negative attitudes can deter teachers' intentions to use technology. The teachers who were skeptical about the reliability of technology or fearful of its technical glitches felt much more hesitant to adopt technology than those viewing technology in a more positive light.

The fourth construct is subjective norm (SN). In line with the previous qualitative research conducted with Chinese EFL university teachers (Huang, Teo, & Zhou, 2019), subjective norm (SN) was also found to be a determinant of BI. However, SN in the context of Thailand was different from SN in the Chinese context to some extent. In China, according to the aforementioned study, SN referred to the social influence at two different levels: the micro level (i.e. school leaders, colleagues, and students) and the macro level (i.e. the assessment of teachers and the policies of schools). In addition, the Chinese government's local and national policies also played an important part in promoting BI among Chinese teachers. In contrast to this picture, the Thai EFL university teachers in this study perceived only the influence of their students, their colleagues, and the trends on their intentions to use technology. In the interviews, when they were asked whether they knew any technology-related policies of the Thai government or those of their institute or university (see questions 11-12 in the Appendix), none of them had clear knowledge or understanding of these policies, although a few mentioned that they "intuitively sensed" or "vaguely knew" that the authority wanted them to use technology in classes. This study's interview data clearly showed the absence in these teachers' awareness or recognition of technology-related institutional and national policies, which made them differ from their Chinese counterparts.

In addition to the four constructs in the framework of the present study, two additional factors came to the surface during the interviews with the participants. They were facilitating conditions (FC) and familiarity with technology. The fifth factor, FC, emerged from the last interview question (i.e. *Apart from what we have discussed so far, are there any other factors that influence your decisions to use or not to use technology in your teaching?*). In fact, there was a reason why this factor, which proved to be an influencing factor of teachers' technology acceptance in the previous studies (Teo, 2011; Wong, 2016), was not included when the framework was formulated. That is the present study was conducted in a major university, where classrooms are equipped with fundamental hardware tools and the Internet. From the researcher's perspective, this seems to provide sufficient facilitating conditions to teachers

who wish to use technology in their classes. Therefore, it was assumed that the lack of resources might not be an issue among the participants in this study. As opposed to this assumption, half of the participants expressed concerns about resource availability and regarded it as one of the factors that influenced their usage intentions. The technologies, they claimed, that should be supported by the institute are paid applications, or those that are not available for free. This suggests that nowadays technologies that teachers need or want to use in the classrooms go beyond computers, projectors, visualizers, and the Internet. Therefore, if the institute would like to encourage teachers to integrate more advanced or cutting-edge technologies into their classrooms, they should invest their money in these technological resources because teachers' intentions to use technology go hand in hand with them.

The final factor was familiarity with technology, which could determine the teachers' attitudes towards it. Familiarity was found to boost the teachers' confidence and make them feel more positive about technology. In contrast, when they used technological tools with which they lack familiarity, they would feel scared or worried. These negative feelings they had were among the deterring factors of their technology acceptance. This suggests that educational institutions striving to promote intentions to use technology among teachers should, first of all, make them familiar with technology through training and workshops. Once teachers get a chance to familiarize themselves with a particular technological tool, they tend to feel less negative about it and be willing to use it more.

Conclusion

Drawing on the Technology Acceptance Model (TAM), this study attempted to investigate the factors that influence technology acceptance among EFL university teachers in Thailand. It was a pioneering study that explored the acceptance of technology among this group of teachers in this local context through qualitative approach. Although it was small-scale research with only eight participants, its in-depth interviews yielded rich qualitative data that provided insights into six factors, including perceived usefulness (PU), perceived ease of use (PEU), attitude towards use (ATT), subjective norm (SN), facilitating conditions (FC), and familiarity with technology, which directly or indirectly influence the teachers' behavioral intentions to use technology (BI). Different relationships among these constructs were also observed.

The results of the study suggest that to promote intentions to use technology among Thai EFL university teachers, more actions are needed at both national and institutional levels. At the national level, policies aimed at enhancing technology integration should be implemented. Most importantly, teachers must be clearly informed of these policies. Without the teachers' full awareness, these policies cannot assert their influence on them and will thus be ineffective. At the institutional level, universities should, first of all, provide sufficient technological resources to their faculty members. In this respect, they also need to keep in mind that basic hardware tools and the Internet may no longer be sufficient to satisfy the changing and expanding needs of teachers and students. Therefore, to make sure these needs are to be satisfied, universities should consider investing in new, cutting-edge platforms or applications. In addition, training and workshops which allow teachers to familiarize

themselves with technology should be provided to enhance their confidence and foster a positive attitude towards technology.

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Appendix
Interview Protocol

Part I: Basic Information

1. What is your current age?
2. How much technology do you use in your personal life? What technology do you use on a regular basis?
3. Are you someone who is comfortable with trying new technology? Why or why not?
4. How long have you been teaching English?
5. Have you used technology in your teaching?
    - If yes: What technology have you used? Tell me about your experience using technology in teaching. How has it been? Did you enjoy it? Why or why not?
    - If no: Why didn't you integrate any technology into your teaching?

Part II: Technology Acceptance

6. What do you think are the roles technologies play in teaching and learning?
7. What are the driving factors influencing your intention to use technology? How do you perceive them? Do you have any specific examples you would like to share?
8. Do you find it easy or difficult to use technology in your teaching?
    - If 'easy': What makes it easy for you?
    - If 'difficult': What makes it difficult for you?
9. What are the worries or concerns preventing your intention to use technology? Do you have any specific examples you would like to share?
10. Do you know any technology-related policies in Thailand?
    - If yes: What do you think of these policy requirements? How much do these policies influence your teaching behavior?
11. Do you know any technology-related policies of this institute or this university?
    - If yes: What do you think of these policy requirements? How much do these policies influence your teaching behavior?
12. Do you think your technology integration decision is influenced by the opinions of others, like administrators, colleagues, or students?
    - If yes: How do others' opinions influence your decision?

13. How much does technology use influence your teaching methods or teaching activities?
14. To what extent does technology use influence the efficiency and/or effectiveness of your teaching?
15. Apart from what we have discussed so far, are there any other factors that influence your decisions to use or not to use technology in your teaching?

About the Author

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