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Mobile Technology for Language Learning and Instruction: Investigating Beliefs and Attitudes of Indonesian EFL Preservice Teachers

Dodi Siraj Muamar Zain
University of Arkansas, Fayetteville

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by

Dodi Siraj Muamar Zain
Semarang State University
Bachelor of Education in English Language Education, 2009
Semarang State University
Master of Education in English Language Education, 2012

May 2022
University of Arkansas

This dissertation is approved for recommendation to the Graduate Council.

_____
Freddie A. Bowles, Ph.D.
Dissertation Director

_____
Christian Z. Goering, Ph.D.
Committee Member

_____
Linda C. Jones, Ph.D.
Committee Member

Abstract

This study is primarily aimed to investigate beliefs and attitudes of Indonesian EFL preservice teachers toward the use of mobile devices such as smartphones or tablets for learning and instructional practice in Indonesia. Furthermore, this phenomenological study attempted to reveal the factors affecting these two constructs from 20 Indonesian EFL preservice teachers through semi-structured interviews. The findings revealed participants' beliefs that mobile devices could positively contribute to the development of language performance as learning tools and the development of language instruction as instructional tools. Regarding attitudes of EFL preservice teachers toward the use of mobile devices for learning and teaching, this study revealed mixed responses. As learning tools, all participants expressed their positive attitudes toward this technology and intention to use this technology more intensively. As for teaching tools, the majority of the participants expressed their negative attitudes which were reflected in their disappointment through their experience during their student teaching program and their lack of interest to adopt this technology for their future classes. However, they acknowledged that this technology was helpful to facilitate online learning and agreed that this technology would become more popular in the future. Analysis of the data also revealed factors affecting beliefs and attitudes of preservice teachers toward the use of mobile devices as learning and instructional tools comprising perceived ease of use and perceived usefulness and other influencing elements of self-efficacy: enactive mastery, vicarious experience, and physiological arousal. Finally, this study presents implications and recommendations which can be a reference to optimize the integrated mobile technology for class instruction and identifies which aspects in the implementation of mobile technology that require further investigation.

Keywords: Beliefs, attitudes, mobile technology

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Dedication

I would like to dedicate this dissertation to my beloved wife and my two lovely sons who have always prayed for my success during my study and supported me in any possible way.

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Chapter I: Introduction

Introduction

The integration of technology for instructional purposes has currently been one of the primary issues to discuss among educational experts and practitioners. The rapid development of technology has triggered the creativity to formulate engaging learning strategies which accommodate learning collaboration (Fu & Hwang, 2018; Zheng, Zhang, & Gyasi, 2019; Keser & Özdamli, 2012) and promote the student-centered learning approach (Ding, Ottenbreit-Leftwich, Lu, & Glazewski, 2019; Kawinkoonlasate, 2019). Also, new variations of instructional models have emerged such as remote learning and blended learning. These models offer more learning opportunities and independence for students to manage their learning. However, positive beliefs and attitudes toward technology (Scherer, Tondeur, Siddiq, & Baran, 2018) should be embraced by all involved parties in the learning and teaching process to assure the successful integration of technology. This study specifically investigated preservice teachers' beliefs and attitudes toward the implementation of mobile technology for language learning and instruction during their teacher preparation program. Reflecting on the development of mobile technology and its increased popularity, there is a high possibility that the current preservice teachers will employ this technology in their future classroom instruction.

This chapter serves to introduce the topic and describe the outlines of this study. It elaborates on the background of the study, statements of the problem, the objectives of the study, and research questions. It also elaborates on the significance and assumptions of the study. The explanation of the theoretical framework coupled with the overview of the proposed method is provided. The final section of this chapter presents the organizations of this study.

Background

The application of technology for pedagogical purposes has initiated various changes that aim to improve the quality of learning and instructional practices. For this reason, the acquisition of digital skills has become a necessity to successfully optimize the use of technology. In schools, teachers are encouraged to acquire and develop their digital skills as part of their professional qualifications. They should be able to design and organize multimedia content in the form of videos (e.g. Blikstad-Balas, 2017) or digital images (e.g. Thompson, 2019) to increase students' learning motivation and the effectiveness of their teaching. Furthermore, they are expected to possess the ability to optimally harness information and communication technologies (ICT) through the internet aside from using word processors, spreadsheets, and databases (Ibieta et al., 2017). ICT can be harnessed as educational technology to improve teachers' professional competence by expanding access to the latest information in education as well as building knowledge and experiences. It also allows teachers to evaluate and reflect on their own instructional practice to help them improve their pedagogical skills (Aubusson et al., 2009). As of now, the application of educational technology has steadily progressed and mobile technology such as tablets and mobile phones has emerged as the current trend in the field of education.

The ubiquity of mobile technology and the students' familiarity with this technology can become the primary reasons why this technology should be adopted for classroom instruction (Aubusson et al., 2009). Seppälä and Alamäki (2003) asserted that the possession of mobile devices among university students reached above 90 percent. Similarly, Tindell and Bohlander (2012) found that 95% of the students own and use mobile phones in their study that involved 269 participants from 21 programs at a small northeastern university. The number of ownerships of mobile phones among K-12 or higher education students keeps increasing (Kukulska-Hulme

& Shield, 2008), along with the number of software, multimedia learning content, and learning websites that are accessible through mobile devices. Cheon, Lee, Crooks, and Song (2012) reported that 87.2% of college students in the United States are willing to use their mobile devices as learning support while the use of mobile learning reaches as high as 52%. Mobile devices are also more affordable while presenting advancing features that support learning processes.

The use of mobile technology as part of the application of mobile learning has encouraged education experts to explore the application of this technology in the classroom (Sung et al., 2016). Mobile technology offers more unique and appealing benefits over computer-based learning which has been commonly integrated into traditional face-to-face teaching (Kukulska-Hulme, 2009; Santosa, 2017). More specifically, this mobile technology offers various values including portability, communicativeness, collaboration, and practicality (Burston, 2015; Kukulska-Hulme, 2015; Ozdamli & Cavus, 2011). The discussion about utilizing mobile devices has led to immense support for many teachers to implement mobile learning with multiple strategies and techniques (Duman, Orhon, & Gedik, 2014) to provide students with a meaningful learning experience.

In terms of language learning, Seppälä and Alamäki (2003) suggested that mobile technology offers various values that can be harnessed to develop language learning. Jee (2011) and Kukulska-Hulme and Viberg (2018) support the claim that mobile learning can benefit students to learn a second language or foreign language by presenting an extensive opportunity to interact and practice using the target language for all levels of education. The latest studies of mobile technology for language learning and teaching also point at the affordances of this model

in facilitating a practical, engaging, attractive learning experience which improves both the rate of interaction and learning interest among students (Dundar & Akcayır, 2014; Ward et al., 2013).

Despite its potential benefits, there are some challenges associated with the application of mobile technology. For instance, adopting mobile instant messaging services or social media which relies on the internet connection is not equally well-accessible in all areas (Akiyama & Cunningham, 2017). It can be a great concern for developing nations such as Indonesia, the primary setting of this study, which is still working on building the necessary infrastructure to support this technology. As for teachers, exploiting mobile technology to present an engaging and meaningful learning experience is also challenging. Despite the need to have sufficient knowledge of technology, teachers often overlook the fact that adopting mobile technology for language learning and instruction requires different perspectives and different approaches (Kassem, 2018). Teachers also need to consider how students' characteristics generate various teaching strategies and utilize diverse learning platforms to alleviate students' learning boredom (Alavi, Borzabadi, & Dashtestani, 2016). Considering the increased attention on this approach, various studies are underway to provide solutions for the current challenges and formulate effective strategies to optimally adopt this approach.

All in all, the application of mobile technology for language learning and instruction constantly develops along with the advent of diverse and innovative educational technology. For this reason, it is essential to prepare future teachers to be well-prepared with various innovations and creativity of technology in their instructional practices. Thus, this study explored beliefs and attitudes of English as a Foreign Language (EFL) preservice teachers toward mobile technology for language learning and instruction during their teacher-training program.

Teaching EFL in Indonesia

The main context of the study is Indonesia where English is considered the primary foreign language to learn by many if not all Indonesian students. It is taught as a compulsory subject from the secondary to tertiary levels of education in Indonesia and is often offered as the primary option of a foreign language to teach in preschools or primary schools. Moreover, it is one of the subjects tested in the national exam and university entrance exam to indicate the mastery of the primary academic skills of students. As a consequence, numerous private learning institutions offer a private mentorship specifically for this subject.

Teachers play the most prominent role in EFL instructional practice in Indonesia. As the learning process mostly occurs in the classrooms, teachers serve as the facilitators who provide the primary learning content and necessary guidance. According to Cirocki and Farrell (2019), there are two main duties of EFL teachers: developing students' language skills of English and presenting engaging and attractive instructional practices based on their students' needs. As for the classroom activities, they are expected to adopt student-centered learning. It means that the teaching and learning process should incorporate activities that actively engage students to acquire knowledge and develop their understanding of particular concepts. Currently, while EFL teachers provide the primary knowledge and develop communicative activities to help students improve their language skills, they might not be the only source of language exposure (Nah, White, & Sussex, 2008; Yamauchi, 2009).

Despite its special position as the primary foreign language in Indonesia, teaching English has been quite challenging. These challenges are caused by various elements which are strongly intertwined and determined the success of instructional practices. The first challenge derives from the position of English as a foreign language which results in the limited use of this

language (Panggabean, 2015). According to Afrough, Rahimi, and Zarafshan (2014), limited opportunities to communicate in a foreign language are encountered by foreign language learners in their own country. This is the challenge! Ultimately, the necessary exposure and opportunities to communicate in the target language are less likely available outside the classroom (Astuti & Lammers, 2017; Mbato, 2013; Lie, 2007; Hamied, 2012).

The second challenge deals with the instructional content. The current curriculum emphasizes the development of students' communicative skills comprising the mastery of conversation skills and various text types. However, the success of learning is determined by the results of final exams which emphasize non-verbal communicative skills and language structure (Hamied, 2012). According to Lie (2007) and Milawati (2019), many EFL teachers plan their classroom activities with an emphasis on isolated vocabulary enrichment, grammar mastery, and reading comprehension to prepare students for the final exam. As a consequence, communicative activities incorporating a collaborative learning approach that encourages students to practice their verbal communication skills are presented in a relatively small proportion.

The third challenge concerns the teachers' competence to serve in their role as facilitators during the learning process. Mukminin et al. (2017) and Mistar (2005) indicated low teaching competence among EFL teachers in Indonesia which is reflected in their teaching styles focusing on the language structure and vocabulary enrichment aside from their low English language competence. Many teachers still follow the traditional teaching pattern by assigning students to complete the written assignments in their textbooks which mostly focus on reading and listening skills (Milawati, 2019). This condition is made worse by the fact that teachers have only a few hours per week for their English class (Astuti & Lammers, 2017). As many teachers believe that

the time in class might not be sufficient, they are forced to meet various learning objectives as mentioned in the curriculum (Sulistiyo et al., 2020).

The fourth challenge concerns the students' perceptions of and attitudes about English as a foreign language. Students' low interest and motivation in EFL teaching are extensively identified although English is considered a compulsory subject (Yulia, 2013; Mbato, 2013; Lie, 2007). The ability to communicate in English is regarded insignificant in some fields of work as English is regarded as a foreign language. Furthermore, the relatively large class size makes it difficult for teachers to develop intensive communicative activities (Ariatna, 2016). In other words, the teaching and learning activities might lack interactivity and students' active involvement which are essential in language learning (Sibarani, 2019; Khasbani, 2018; Nichols, 2014).

The final challenge deals with the supporting facilities and infrastructure. The current curriculum and the latest trend in the field of education demand the modernization of educational practices. However, the lack of necessary equipment and facilities such as laboratories, audio systems, and internet connectivity has always emerged as a persistent issue over the years (Songbatumis, 2017).

The challenges have been addressed in many studies and various efforts have been made by teacher-training institutions, experts, and the government to alleviate them. However, teachers are still troubled by these challenges over the years. In the recent studies, Sulistiyo et al. (2020), as well as Astuti and Lammers (2017), argued the existing issues in the current educational practice are mainly caused by the lack of attention to teachers' teaching skills, classroom management skills, class size, and the school infrastructure.

The Integration of Mobile Technology in Indonesian Schools

A growing interest in mobile technology in Indonesia has developed in the last few years. This phenomenon is likely caused by the development and trend of mobile technology granting almost all learners access to internet content and opportunities to interact with one another without any restriction of time and place. It is reported that the number of smartphone users in Indonesia is rising steadily and is predicted to reach as high as 89.86 million by 2022 (Statista, 2020). Indonesia is also considered one of the largest mobile internet markets globally with a soaring number of mobile internet users, especially teenagers, accessing social media such as Facebook and Twitter (Statista, 2020). This phenomenon can be seen as a potential opportunity to utilize mobile technology for language learning and instruction.

In the area of language learning, Mobile-Assisted Language Learning (MALL) is a concept that covers ideas and strategies to improve the quality of language learning and instruction through mobile technology (Kukulska-Hulme, 2012; Tonoian, 2014). MALL is regarded as a sub-section of Computer-Assisted Language Learning (CALL) referring to a learning approach that is grounded in the use of mobile devices in language learning (Triplett, 2018). MALL allows learners to personalize their language learning based on their respective styles (Kukulska-Hulme & Traxler, 2007; Mehdipour & Zerehkafi, 2013). Viberg and Grönlund (2012) described MALL as a sub-field of mobile learning that focuses on language learning featuring mobility and portability to expand the opportunities for learning beyond classroom settings. However, definitions of MALL are still in debate as it continues to evolve along with the progressive nature of mobile technology (Alrasheedi, 2015).

Studies on MALL have currently been attracting interest from researchers and teaching practitioners, especially in Indonesia. Various teaching platforms and mobile applications have

been developed to support language learning (Zainuddin, 2017; Imelda, Cahyono, & Astuti, 2019; Priyatno, 2017; Nariyati, Sudirman, & Pratiwi, 2020). For instance, Sari and Putri (2019) found that WhatsApp Group Chat was practical to enhance the intensity of interaction among students, bridge interaction between the teacher and students, ease work submission, and provide feedback after submission. The study suggested that teachers intending to use the tool be prepared for emerging issues such as poor connection, overload chats, and junk notification and formulate plans to anticipate the issues. It aligns with the findings of Jones, Murphy, and Holland (2015) who concluded that group chat could bridge interaction that supported second language discourse with its own benefits in comparison with face-to-face interaction. Also, in another study, Wulandari (2019) harnessed an Instagram Vlog as an attempt to develop students' EFL speaking performance. Students were assigned records of their speaking in six one to three-minute videos on specific topics through the carousel feature of Instagram. The study found that Instagram contributed to the development of students' oral communicative proficiency. It further indicated that using the mobile application managed to increase students' learning motivation.

Statements of the Problem

Various arguments from related literature lead to a strong recommendation for a modernization of the current education system through educational technology. For instance, Franklin (2011) raised a concern about developing our education system by adopting the latest technology and altering the way instructors view the system itself. Thus, teachers need to display a positive attitude toward technology and perceive it as a potential medium that can increase the quality of teaching (Albirini, 2006). Literature also shows a rising trend of educational technology along with various teaching approaches indicating that teachers will inevitably adopt technology in their classes (Kim & Bonk, 2006).

The growing interest in educational technology especially mobile technology has attracted my attention to conduct a study to investigate the application of mobile devices as a potential learning tool for language learning. Despite the rising popularity of mobile technology, research still indicates some teachers' resistance and other barriers to the integration of this technology in their classes. Gillespie (2014) mentioned that both teachers and schools continue to question the effectiveness of technologies in class. Also, studies found that many teachers are comfortable adopting the traditional model of instruction with limited use of technology to support this preference (Kurt, 2013). Shifting from the traditional teaching approach to a more modernized and engaging teaching approach by adopting technology is not an easy task (Al-Emran et al., 2018). Obtaining the required digital skills and competence to effectively use technology is deemed necessary. Teachers also need to deal with any possible issues emerging during the learning process such as accidental data deletion or slow computational processing (Lu, 2008). General training is required to cope with these issues and yet, positive beliefs and attitudes toward technology should be developed along with their confidence to use technology as a tool to increase the chance of adopting technology for instruction (Holden & Rada, 2011). As for schools, special training and professional support should be provided by school administration to improve teachers' professionality and competence as well as develop positive perceptions and attitudes toward technology. Schools need to support and assist teachers to accept technology and gain technology self-efficacy to successfully adopt it in class (Tondeur, van Braak, Siddiq, & Scherer, 2016; Wildner, 2013)

Self-efficacy toward technology determines how technology is utilized and harnessed for particular objectives. It influences how individuals perceive technology which further contributes to the outcomes of the use of technology (Holden & Rada, 2011; Richardson, 1996). Various

literature strongly indicates that positive beliefs and attitudes promote the successful integration of technology for instructional purposes (Imtiaz & Maarop, 2014; Straub, 2009; Teo & van Schaik, 2012). Focusing on beliefs and attitudes toward technology, this study is directed to EFL preservice teachers who potentially integrate mobile technology for their future language learning and instruction. With only a limited number of studies concerning preservice teachers specifically in the area of EFL instruction, this study proposes several implications that may be of value to improve the curriculum in higher education, especially the teacher preparation program.

The Objectives of the Study and Research Questions

This study is designed to achieve the following objectives: First, this study describes beliefs and attitudes of EFL preservice teachers toward mobile technology for language learning and instruction during their teacher preparation program. Second, the influencing factors that determine EFL preservice teachers' beliefs and attitudes toward this technology are elicited as a part of the discussion to formulate possible implications to improve its application in future instructional practices. Thus, the following research questions are formulated to serve as a guide for the inquiry:

1. What do EFL preservice teachers believe regarding the application of mobile technology for language learning and instruction during their teacher preparation program?
2. What attitudes do EFL preservice teachers demonstrate toward the application of mobile technology for language learning and instruction?
3. What factors affect these beliefs and attitudes?

Significance of the Study

Considering the prospect of mobile technology, the significance of the study is to provide information that is useful for the effective application of this technology for language learning and instruction. Ifeanyi & Chukwuere (2018) assert that mobile devices such as smartphones can be used to promote active language learning activities that enhance students' learning abilities and accelerate learning progress with appropriate applications and strategies. Also, further studies regarding the latest application of mobile technology for language learning that describes learners' experiences with mobile devices including likes and dislikes or benefits and challenges are encouraged (Tossell et al., 2014).

Aside from revealing the possible benefits and challenges, investigating beliefs and attitudes toward mobile technology is also essential. Numerous studies have provided evidence regarding how this technology has been perceived and practiced from the perspectives of teachers and students. This study, however, is directed to examine EFL preservice teachers who are likely to adopt this approach in their future instructional practices. Thus, the results can serve as a reflection of how mobile technology is introduced and harnessed in a teacher preparation program and higher education. These results can contribute to possible improvement in the current curriculum as a consideration to introduce and integrate mobile technology to support the learning and teaching process.

Assumptions

In this study, it is assumed that the participants, EFL preservice teachers, had some experience in using mobile technology during their teacher preparation program. Along with the rapid development of technology, all participants likely possess mobile devices and use them for learning tools. Also, with the emergence of the global pandemic and the policy to shift the

instructional mode from in-person teaching to online teaching, there was a high possibility that the participants, who were enrolled in the student-teaching program, used mobile devices to facilitate classroom instruction. I also believe that the participants provided honest responses to the given questions during the data collection procedures. The questions were explained clearly and the participants confirmed if they could comprehend the questions. As for the analysis, the data were interpreted carefully and the steps of the analysis were explicitly described to diminish the effect of potential bias in presenting research discussion and generating the conclusion.

Theoretical Framework

This study adopted two theoretical frameworks comprising the Technology Acceptance Model (TAM) and self-efficacy theory both of which were adjusted to meet the study objectives. TAM was first introduced by Davis (1989) to provide a theoretical foundation and systematic measurement of how technology is perceived and responded to by users. Specifically, this model postulates the idea that personality traits including intentions, attitudes, and perceived practicality of technology directly or indirectly affect the outcomes of technology integration (Agyei et al., 2020). Teo, Lee, and Chai (2008) further assert that this model can explain the existing correlation between technological perceptions and user's performance on the use of technology. Furthermore, TAM also indicates the existence of external factors that determine the users' performance comprising self-efficacy, personal norms, satisfaction, technology anxiety, and experience (Abdullah & Ward, 2016).

Self-efficacy theory is a subdivision of Bandura's (1986) social cognitive theory. According to this theory, successful performance is associated with the individual's perceptions of self-efficacy and outcome expectancies. This theory supports the concept that each individual possesses the potential and necessary capabilities to acquire success under specific conditions

(Lippke, 2017). Also, self-efficacy is deemed essential as individuals make efforts to reach particular objectives by comprehending positive and negative outcomes. Aside from the aforementioned personal factors, this theory also highlights the essence of behavioral and environmental factors which determine the outcomes of particular actions (Gallagher, 2012).

Overview of the Method

This study employs a qualitative approach due to the nature of affective factors which include subjectivity and careful interpretation (Ratner, 2002). Cornelius (2018) asserted that a qualitative approach can be utilized to investigate behaviors, perspectives, and thoughts of a group of students toward their learning practices as well as their experience in learning that affects their development. This approach incorporates the most appropriate model of investigation to describe the actual application of mobile technology and explore the affective and cognitive experiences that students acquire (Glesne, 2011). Furthermore, this approach is suitable for examining a special case or phenomenon as a result of interaction among individuals or between humans and their environment (Creswell & Poth, 2016).

This study adopted a phenomenological study to explore the addressed issues. Van Manen (1997) describes phenomenology as a study that explores an individual's lived experience of the world. Substantially, this study investigated phenomena through the lenses of particular participants by explaining how they perceive, behave, and make meanings of these phenomena (Teherani et al., 2015). Furthermore, Rodriguez and Smith (2018) asserted that phenomenology is grounded in the naturalistic paradigm seeking the explanation of nature and the meaning of individuals' experiences toward certain phenomena. Thus, this study is expected to provide a better insight into EFL preservice teachers' beliefs and attitudes toward the application of mobile technology for language learning and instruction.

An interview was utilized as the primary instrument in this study to gather qualitative data. The instrument was administered in an informal and semi-structured format using a set of open-ended questions. The interviewer developed the interaction with additional unstructured questions related to the topic (DiCicco-Bloom & Crabtree, 2006). In other words, additional questions related to the topic were asked to the participants to clarify or explain their responses. The qualitative data were further analyzed to provide in-depth analysis and discussion regarding the research questions formulated in this study.

Organization of the Study

This dissertation comprises five chapters. Chapter One serves as the introductory chapter. It presents the background of this study, statements of the problem, the objectives of the study, and research questions. It also presents the significance and assumptions of the study. The explanation of the theoretical framework is provided and coupled with the overview of the proposed method. Additionally, this chapter presents the organizations of this study. Chapter Two offers a discussion of a relevant literature review for this study. It includes current academic literature on the topics of educational technology, mobile technology, mobile learning, and MALL. Specifically, it explores teachers' beliefs and attitudes toward educational technology. A detailed discussion of each piece of the theoretical framework. Chapter Three describes the research methodology. It explains the qualitative nature and phenomenological approach employed in this study. It also presents the details of the interview as the instrument of data and the involved participants along with the procedure of data collection and analysis. Furthermore, reliability and the ethics section for this study are provided. Chapter Four provides detailed results and analysis of the data collection. Finally, Chapter Five discusses the summary of results and conclusions. This chapter also offers recommendations, indicates possible areas for future

study, and formulates possible implications of the future application of mobile technology for language learning and instruction.

Chapter II: Review of the Literature

Introduction

Identifying the elements of mobile technology for language learning and instruction is necessary to comprehend English as a Foreign Language (EFL) preservice teachers' beliefs and attitudes toward this technology during their teacher preparation program. Therefore, in this section, I present a summary of the literature review that comprises relevant themes in the area of this study. Initially, I focus my attention on general aspects of instructional technology and mobile technology for language learning and instruction. Next, I address preservice teachers' beliefs and attitudes toward mobile technology from both primary and secondary literature references to answer research question 1 and 2. Finally, I include a discussion of the theoretical foundation of this study comprising the Technology Acceptance Model (TAM) and self-efficacy theory to answer question 3. These two frameworks serve as the basis for data collection and explain the factors influencing beliefs and attitudes of preservice teachers in mobile technology.

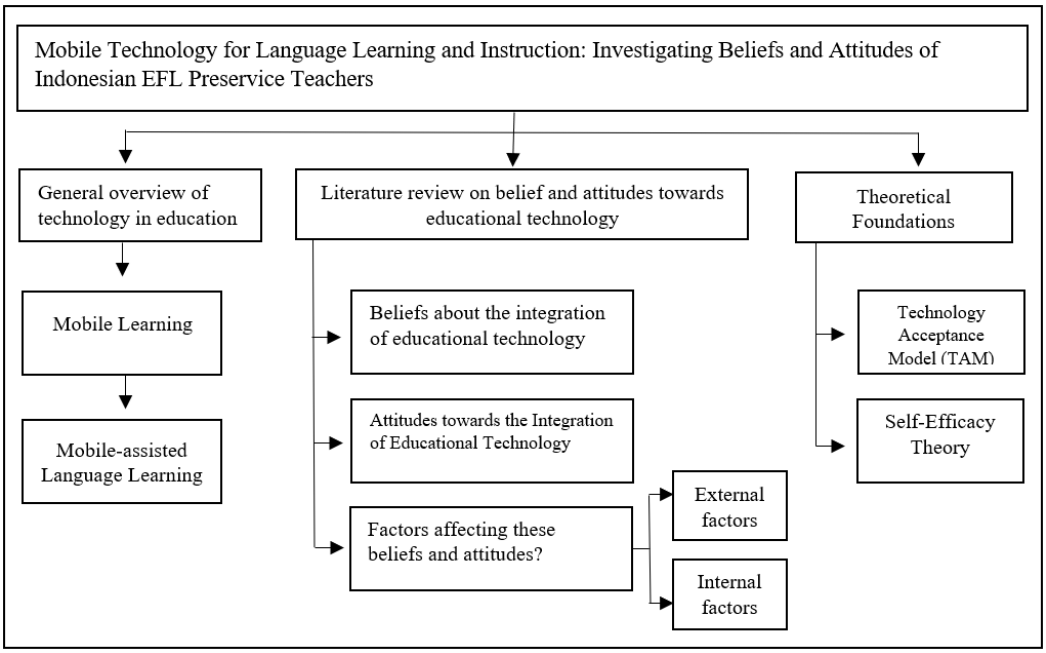

Figure 1. Literature map

An Overview of Educational Technology

Educational or instructional technology referring to particular forms of technology for educational purposes has attained an incredible reckoning due to the impact of globalization. Technology has played an essential role in the field of education by transforming how people transfer knowledge through instructional practice and gain knowledge beyond what can be acquired through conventional instructional methods (Fisher et al., 2016; Kukulska-Hulme, 2012; Sauro, 2014). Computers and other digital technologies have been utilized for educational purposes since the 1960s. Since then, various conceptual frameworks have been formulated to create innovation and advancement for instructional designs. Moreover, the rapid development of Information and Communication Technology (ICT) has transformed the face of education through the emergence of intensive technology-based instructional models and strategies such as online and hybrid learning. The ideas and innovations through technology constantly developed to enhance the quality of education (Sivin-Kachala & Bialo, 2000).

The immense interest in educational technology is reflected in the increasing number of studies that investigate the impacts of technology on the quality of learning and instruction. The majority of them acknowledged the affordance of educational technology and suggested a more extensive use to support learning considering the impact it has on students' life (Wu et al., 2017; Chen-Hsieh et al., 2017). Several studies (e.g. Chen & Lin, 2018; Reynolds & Taylor, 2020; Alharbi, 2019; Grimshaw & Cardoso, 2018; Le, 2020) also provided evidence on how students perceived and responded to the use of educational technology as supporting learning tools. Despite the existing technology barriers, these studies demonstrated students' positive beliefs and attitudes toward educational technology. Furthermore, employing technology such as computers or handheld devices can potentially improve students' skills (Jensen, 2019; Hwang et

al., 2019; Luo et al., 2019; Lin et al., 2018), offer learning personalization (Sung et al., 2016), and facilitate a more engaging learning experience (e.g. Freiermuth & Huang, 2012; Caldwell, 2018; Mills et al., 2018; Abu-Al-Aish & Love, 2013).

Mobile Learning

Mobile learning is considered the latest innovation in remote learning and, overall, in educational technology (Kaliisa & Picard, 2017). This instructional model added extra mobility and accessibility to the currently adopted e-learning allowing teachers and students to manage the instructional and learning practice with more flexibility. Students especially can access the posted learning content and join the additional class discussion. Teachers, on the other hand, manage the class by organizing students to collaborate and interact to construct knowledge (Cochrane & Antonczak, 2014), which reflects the work of constructivism. Yeap et al. (2016) inferred that mobile learning works suitably for short-duration courses that are coupled with specifically compiled learning content or theories. This study indicates that mobile learning might better serve as a supplementary learning activity to help students with their self-directed learning rather than as the primary mode of instruction. Furthermore, mobile learning excels from regular e-learning in terms of the frequency of accessibility which allow learners to join courses or class discussion after school hours at any convenient time through different types of mobile devices (Hashemi et al., 2011). Pachler (2007) posited that the use of mobile devices to support learning will create wider opportunities to innovate for teaching practitioners and teachers. The idea of personalized learning can be realized through the concept of mobile learning.

The ubiquity of mobile devices among students can be seen as an opportunity to apply mobile learning in the current instructional practice. In Indonesia, for example, a survey reported

that the number of mobile device users within a 12-30-year-old group steadily increases and they are actively utilizing the internet service for various purposes especially social media (Statista, 2020). Due to this phenomenon, scholars are motivated to conduct research in different fields of study to formulate strategies for the effective application of mobile learning. Hwang and Chang (2011) stated that various studies examining the effectiveness of mobile technologies for instructional practice have been conducted in various academic disciplines such as social science, physics, mathematics, and language learning.

The term "mobile learning" has attracted considerable attention regarding its definition. Many critical, theoretical, and empirical studies in recent years have attempted to provide a basic and clear definition. However, this term continually evolves along with the development of mobile technology with the inclusion of new pedagogical concepts. Kukulska-Hulme (2009) highlighted the ambiguity of the reference to the "mobile" element in mobile learning. It is still unclear if this element refers to the learner, technology, or learning content. The same concern is shown by Pegrum (2014) and Hockly (2013), who agreed that the concept of mobility as a pivotal element of mobile learning is still undecided. Therefore, it is necessary to conduct further research to explore both the learning experience of the learner and what characterizes mobile learning to stand on its own (Traxler, 2007).

The conceptualization of mobile learning has improved along with the continuous development and innovation occurring in the area of education. For instance, this approach is initially defined as a learning approach that utilizes certain mobile devices as learning support (Stone, 2004). Cochrane (2010) described it as s a technologically-oriented learning approach, which is established under a technological construct and relies heavily on the existing features offered in the devices. Uluyol and Agca (2012) addressed the socially embedded values of this

concept which serve to bridge a connection among individuals within a particular learning setting. The current concept of mobile learning highlights learning connectivity and mobility which expand the learning opportunities for students. According to Viberg and Grönlund (2013), this approach has developed along with the rapid improvement of the ICT. It is further described as an advanced form of e-learning that utilizes wireless-connected mobile devices. Mobinizad (2018) described it as a learning approach that legitimizes learners' mobility allowing them to change location as they are engaged in learning interaction. Bikanga Ada, et. al. (2017) looked beyond the learners' mobility describing this approach as a means for teachers to provide learning input regardless of the location, situation, and time. Hall and Connolly (2019) described mobile learning as an approach that highlights the benefits of wireless mobile devices to stimulate learning innovation and enhance the learning experience in various instructional settings. This approach engages students in a learning process to formulate knowledge through mobile devices (Jinot, 2019). However, considering the continuous progress of technology, the concept of mobile learning should focus on the learners and teachers as the main users instead of the offered features of the devices.

Additionally, the classification of devices referring to the portability and mobility of the devices often leads to confusion. There is an argument regarding the size and portability of mobile devices to determine what quality they should possess to be considered "mobile" (Traxler, 2009). Franklin (2011) straightened this concept by offering a classification of mobile devices primarily based on portability despite sharing similar functions. The first class, which possesses the highest portability due to its smallest size, includes smartphones of various sizes. Moving to devices with a bigger screen with slightly lower portability, the second class includes tablets and netbooks. The last class, which has the lowest portability, includes laptops. However,

laptops are often argued as non-mobile devices due to certain reasons such as weight and their commonly short power supply despite their portability. Naderi (2018) emphasized the portability of mobile devices which often excludes laptops. The current laptops, however, tend to be more lightweight with bigger battery capacity giving higher portability opposing the argument for excluding laptops in the mobile category.

Mobile-Assisted Language Learning (MALL)

Language learning has adapted well to the development of mobile learning as shown by numerous studies concerning the use of mobile technology to improve students' language competence. In the practice of language learning, this type of mobile learning has been subcategorized into MALL. The concept of MALL is often perceived as the next form of computer-assisted language learning and remote learning, which were previously introduced and popular among language teaching practitioners (Al Qasim & Al Fadda, 2013). The term MALL was initially introduced by Chinnery (2006) to designate an area of mobile learning that is specifically related to second and foreign language study (Yang, 2013).

MALL is closely related to CALL (Computer-Assisted Language Learning) and is often considered a branch of the approach which was strongly highlighted in the area of language learning. However, it must be understood that these two concepts possess their respective nature regarding the designed activities assisted by a particular use of technology (Marlowe, 2018). In general, MALL refers to an approach underpinning the practice of language learning which is augmented by the adoption of mobile devices. Kukulska-Hulme (2013) described MALL as an approach harnessing mobile technologies such as smartphones and tablets to accommodate spontaneous and personal language learning. It is also defined as a learning or instructional facility with the primary technical support of mobile or handheld devices (Traxler, 2005). MALL

itself keeps developing, which is likely to create different definitions of terms, theories, and learning trends in the future.

As its name suggests, the main strength of MALL lies in its mobility. In this new era, mobility has been deemed as an essential feature that supports the currently highlighted concept of student-centered learning. Through mobile devices, students can efficiently receive guidance from their teachers to build their concept of knowledge either individually or collaboratively (Kukulska-Hulme, 2013). Furthermore, the mobility and portability of devices that can offer assistance anytime at any place can be an important asset to support students' learning. For example, students can look up certain words in the target language immediately through an electronic dictionary on mobile devices or learn about language grammar from mobile learning applications. Thus, mobile technologies build new learning dimensions through their sophisticated features (Pachler, Cook, & Bachmair, 2010).

The use of handheld devices such as tablets and mobile phones opens a possibility for improved and easier access to extensive, practical, and multi-context learning spontaneity (Kukulska-Hulme & Shields, 2008; Huang et al., 2012). Teachers have a greater opportunity to construct an extensive model of instruction allowing students to interact and engage in a learning discussion after school hours (Hsu et al., 2013). On the other hand, students can be instructed to access learning content for the upcoming class meeting. MALL also makes it possible for students to engage in the learning process during and after the classroom period (Rouhi & Mohebbi, 2013) and creates a personalized form of learning that suits students' needs (Yuniarti, 2014; Martin & Ertzberger, 2016). Furthermore, it can serve as a supporting asset for the current learning practice with newly developed innovation through a learning network that allows collaborative, outdoor, and gamified learning models.

Beliefs about the Integration of Educational Technology

Beliefs about technologies are diverse among teachers and uniquely based on various variables. Palak and Walls (2009) agreed that technology affects how teachers expect to manage their classes and how students are expected to follow the teachers' instruction. With technology, teachers need to allocate their time to practice operating it and optimize its use for designing and administering classroom activities. Palak and Walls (2009) also believed that teachers' beliefs are the key factors that affect their actions and decisions to manage their class. Adukaite et al., (2017) asserted that these beliefs are manifestations of social interaction and personal experience. Failure to identify teachers' beliefs of technology might lead to the inability to comprehend the influencing factors for adopting or discarding the technology plans (Cho & Littenberg-Tobias, 2016). Moreover, Al-Senaidi, Lin, and Poirot (2009) clarified that resistance to technology integration into the classroom might occur as teachers fail to acknowledge the usefulness of technology due to their negative beliefs of technology to improve the quality of instruction.

Teachers' belief in technology is a determinant of the successful integration of educational technology. The impact of beliefs about educational technology can be seen in the actions shown by teachers as they use it in their classes (Shifflet & Weilbacher, 2015). Since technology has been more ubiquitous, the use of technology is becoming more common among teachers. Therefore, discussions among educational experts and teaching practitioners are also directed toward beliefs of technology for classroom instruction (McKnight et al., 2016; Tondeur et al., 2017; Ertmer et al., 2012; Brush & Saye, 2009). According to Anderson et al., (2011), teachers' motivation to use technology is shaped by their personal beliefs that technology can offer great benefits to their teaching performance and help to achieve teaching objectives. It

means that teachers might be discouraged to adopt technology in class if they are unsure of the effectiveness of technology (Kan & Murat, 2020). Shifflet and Weilbacher (2015) supported those ideas and asserted that teachers determine if they need to use technology as supporting tools in their class based on their perceptions and beliefs about the use of technology. Joo et al. (2018) further suggested that positive beliefs about technology will encourage teachers to more frequently utilize technology especially when they find a connection between technology with their specific content areas. Additionally, teachers must know what they can do with technology and actively engage students with these tools (McKnight et al., 2016). With that in mind, using technology merely as a tool to deliver learning content and access class assignments might not reveal the real value of technology in teaching.

Beliefs toward technology strongly affect how teachers select particular variants of educational technology for their classroom instruction. Shifflet and Weilbacher (2015) found that teachers' action regarding their efforts to adopt technology in class is a reflection of their beliefs. Subsequently, these beliefs are greatly influenced by the teachers' philosophy regarding how students learn. Another issue to address about teachers' beliefs in the adoption of technology is the shift of approach to learning. Studies found that technology can be optimally harnessed if students are assisted to actively participate in learning as the center of attention (Yang, 2020; Chen, 2013; Al-Senaidi, Lin, & Poirot, 2009). In accordance with the constructivist learning principles, the use of technology should allow students to collaborate with their peers and solve the issues presented in class while supporting teachers as the facilitators of learning. Moreover, the integration of educational technologies should address personalized learning which highlights students' unique personalities and visualize their performance (Crossley & McNamara, 2016). For teachers, technology should allow them to monitor students' progress during their learning

process (Chiang et al., 2014). However, Johnson et al., (2016) reported that adopting constructivist principles through technology-assisted activities could pose challenging tasks as it should be facilitated by sufficient technology support to meet student needs, achieve various learning goals, and overcome possible barriers.

To discuss teachers' beliefs toward technology, it is also necessary to examine their pedagogical beliefs. In this case, teachers' pedagogical beliefs are strongly correlated to their methods to adopt technology in the class. Various studies (e.g. Tondeur et al., 2017; Ertmer et al., 2012; Bai & Ertmer, 2008; Mueller, & Wood, 2012) provided evidence of how educational technology is employed by teachers in particular ways based on their respective pedagogical beliefs. Palak and Walls (2009) believed that adopting technology does not necessarily transform teachers' teaching styles. They agreed that it is teachers' pedagogical beliefs that determine how technology is incorporated into teaching. For this matter, Lim and Chan (2007) mentioned two divisions of teachers' pedagogical beliefs comprising traditional and constructivist. Traditional teachers tend to centrally control the class and adopt teacher-centered tasks to deliver learning content. Lim and Chai (2008) implied that traditional teachers focus on providing skills and knowledge for their students. Also, they tend to think that students are reliant on the explicit transfer of learning content. Thus, these teachers might assume technology will hinder the effectiveness of the learning process which leads to limited use of technology in their teaching practices (Hermans et al., 2008). Technology will only be harnessed for developing additional demonstrative learning activities for specific educational units.

Preservice teachers' pedagogical beliefs on the effective application of mobile technology

The findings in several studies indicated that preservice teachers' pedagogical beliefs reflected their conceptions of mobile learning. For example, Tsai & Tsai (2019) concluded that

pedagogical perspectives determine the decision to select the strategies and models to adopt mobile technology in their classes. In their study, the preservice teachers which followed constructivist perspectives tended to formulate lesson plans incorporating engaging learning activities with mobile technology. They believed that mobile learning could be optimally applied in the classroom by providing learning activities that stimulate students' active participation and involvement. The study further claimed that those following traditional perspectives tend to offer less engaging learning activities and relied more on the traditional lecturing technique.

In general, pedagogical beliefs are relatively consistent and permanent. Therefore, intensive efforts to facilitate teachers' professional development are necessary to develop these beliefs. For instance, Gloria and Oluwadara (2016) commented that many teachers in Sub-Saharan Africa tended to avoid mobile learning. They assumed that the lack of intensive training on harnessing this technology for instructional purposes contributed to their preference to stick with traditional teaching methods. The findings indicated an improvement in their self-efficacy toward mobile technology as a result of the intensive training. In another study, Sánchez-Prieto et al. (2019) intended to examine the predictive effect of the "resistance to change" and "attachment" on the adoption of mobile technology. This study adopted a TAM-based model and recruited 222 Spanish secondary education preservice teachers as the samples. The authors agreed that the "resistance to change" significantly influenced the intention to use mobile technology. As for the "attachment," the study found that this construct exposed a small impact on the participants' intention to use mobile technology.

Attitudes toward the Integration of Educational Technology

While knowing that teachers' attitudes toward technology is essential as a determinant of the successful integration of technology, it is also necessary to comprehend the term attitude

itself. According to Renaud (2013), attitudes refer to a particular judgment on a specific phenomenon or item. This judgment is established on the basis of the complexity of beliefs reflecting personal feelings, opinions, prejudice or bias, and perceived concepts about particular themes (Gardner, 1985) which tend to be consistent and permanent (Triandis, 1971). Díez-Palomar et al. (2020) explained that attitudes deal with personal choices of response toward specific objects which is specific to every individual. Furthermore, Matteson et al. (2016) asserted that attitudes are reactions derived from a complex interplay between three primary elements: affective, behavioral, and cognitive. The affective element can be defined as personal feelings or emotions toward information input which include "likes" or "dislikes" and "with" or "against." The behavioral element refers to intentions to respond or react to particular input accordingly (Wenden, 1991). The cognitive element refers to individuals' beliefs, thoughts, or ideas about particular objects of the attitude. Also, attitudes can be implied as personal evaluations of particular input or exposure which lead to positive or negative reactions (Getie, 2020). Substantially, attitudes cover various psychological conceptualizations, and thus it takes a lot of effort and a complex process to describe their intertwined elements. Regarding the topic of this study, attitudes toward technology can be inferred as personal evaluation toward technology use which might indicate a personal preference to adopt or abandon technology (Ardies et al., 2015).

Researchers showed that attitudes can be evaluated through various scales and values subconsciously and recurrently. Gettie (2020) agreed that recent studies managed to formulate a certain measure to successfully evaluate attitudes. Scherer, Tondeur, Siddiq, & Baran (2018) believed that attitudes are the manifestation of various psychological elements including emotional states, thoughts, and social connections. Attitudes also highlight the significance of

social values that affect an individual sense of their life, world, and community. Furthermore, Crano et al. (2011) described attitudes as reflecting emotional reactions including the acceptance and rejection of a particular thing, individual, or phenomenon. Substantially, attitude is a manifestation of a set of beliefs of an individual which determine the reactions to a particular stimulus (Habeeb, 2014). According to Bohner and Dickel (2011), attitudes are hypothetically established to indicate the reactions or responses to certain stimuli. Therefore, Arnulf et al. (2018) argued that attitudes might not well be interpreted through direct observation, but instead, they can be better inferred through individual responses. Information processing also takes part in the manifestation of attitudes so that similar attitudes are generated from different individuals receiving the same information input (DeMarree et al., 2017). According to Mueller (1986), attitudes reflect individuals' positive or negative judgments or preferences of particular psychological objects. Therefore, teachers' attitudes measured with high reliability might serve as valuable information to formulate strategies to improve teacher professional and academic qualifications, especially in technology integration.

Teachers themselves hold a pivotal role in the adoption of educational technologies among all involved parties in education. Shifflet and Weilbacher (2015) stated that teachers' positive attitudes toward technology are necessary for successful technology integration. As Siyam (2019) and Joo et al. (2018) suggested, teachers' initiative to adopt technology is reliant upon positive attitudes and supports from their surrounding environments. Similarly, Hernández-Ramos et al. (2014) asserted that teachers' intention to use technology to develop their lesson plans is greatly affected by their attitudes toward technology. Loong and Herbert (2018) implied that the features offered by the latest technology might not be the primary reasons for teachers to

use or avoid it in their classes. However, special attention should be directed to positive attitudes toward technology which primarily affect teachers' willingness to adopt it.

Various studies have provided us references on the effectiveness of instructional technologies and the impacts they have on teachers' and students' performance, but only a limited number of studies focus on the teachers' beliefs and attitudes, especially in the area of EFL teaching (Trace et al., 2018). Habeeb (2014) also mentioned that studies in the area of education seem to underestimate the significance of the teachers' subjective perceptions despite the impacts they have on the instructional practices. Additionally, Shifflet and Weilbacher (2015) suggested researchers place their attention on how beliefs on the use of technology are generated and the effects of these beliefs on an individual's attitudes. In general, there is a need to conduct new studies on teacher beliefs and attitudes toward technology integration to provide myriad references which cover wider social, economic, political, and cultural backgrounds, especially within the area of EFL education.

Readiness and acceptance of mobile technology

The indication that preservice teachers possess positive attitudes toward mobile learning lies in their readiness levels in adopting this model. Multiple studies attempted to illustrate how the readiness of preservice teachers could affect the acceptance of this approach and further reflect the attitudes and pedagogical beliefs. For instance, Tezer and Beyoğlu (2018) found that the increase in the readiness and attitude levels regarding the application of mobile learning is in line with the improved acceptance of this approach among preservice teachers.

Several studies explained the elements which affect attitudes and determine the degrees of readiness for mobile learning. For example, Asghar, Barberà, and Younas (2021) agreed that the ease of access to mobile technology and internet connection triggered readiness and better

acceptance of mobile learning. Additionally, they emphasized the importance of multiple variables including effort expectancy, performance expectancy, personal innovation, quality of services, social influence, and behavioral intentions which shaped individual attitudes to adopt mobile technology. In one study, Ata & Cevik (2019) claimed that preservice teachers' learning styles would affect how they accept mobile technology in their future teaching. Those who have a high level of confidence in using technology to help learning and more self-dependence in the learning process are likely to be more ready to accept mobile learning. Furthermore, other variables including family background, economic standing, technological habits, and genders moderately contribute to the demonstration of learning styles and subsequently the intention to adopt mobile. Similarly, Sungur-Gül and Ateş (2021) conducted a study to investigate Turkish preservice teachers' readiness in using mobile technology for instructional purposes. Adopting the Theory of Planned Behavior, the study attempted to identify the psychological motives that drove them to employ mobile technology. The authors found multiple variables including subjective norms, and perceived behavioral control substantially affect the readiness to adopt mobile learning. An interesting finding was found in a study by Karakas and Kartal (2020) which implied a resistance toward mobile learning due to the low degrees of readiness toward the Web 2.0 tools and mobile apps among 388 preservice teachers in Turkey. The study identified participants' unfamiliarity with the employed tools and apps as well as the lack of training for mobile learning.

Perceived ease of use and perceived usefulness of mobile technology

Two significant variables contributing to the attitudes toward mobile technology are perceived ease of use and perceived usefulness of mobile technology. In the Technology Acceptance Model (TAM) proposed by Davis et al. (1989) and some other models to measure

attitudes toward technology, these two variables were always highlighted as the determinants of whether technology was rejected or accepted. For instance, Islamoglu, Yurdakul, and Ursavas (2021) conducted two discrete studies to design a special course focusing on mobile information technology. From the study, it was concluded that preservice teachers gain direct encouragement to employ mobile technology for instructional purposes under the positive impression of perceived ease of use and their social influence. Moreover, their self-efficacy to use mobile technology was deemed influential in a more indirect way. This finding was also presented in a study by Asghar, Barberà, and Younas (2021) which highlighted the ease of access to mobile technology as well as internet support which strongly affect preservice teachers' intention to adopt mobile technology. Similarly, Çakiroglu, Gökoglu, and Öztürk (2017) suggested that the current impression of mobile learning to preservice teachers shaped their conceptions of this approach. In other words, preservice teachers' positive attitudes were attributed to a positive impression and experience with this approach. This study also emphasized the need to acclimatize mobile technology to preservice teachers which helps them comprehend the usefulness and practicality of this technology for their future instruction.

Influencing factors in the Integration of Technology

Today's education has been influenced by the rapid development of technology. In Indonesia, the attention toward the issue of the integration of technology has been shown by the government by facilitating funds for the improvement of classroom facilities. Also, the education institutions continuously offer assistance to share ideas and provide training in order to develop teachers' competencies regarding effective integration of educational technology. This support will improve teachers' awareness of the affordances of instructional technology and thus lead to teacher's technology acceptance. However, studies still imply external and internal barriers faced

by educators and teaching practitioners at almost all levels of education regarding the current issues in educational technology integration.

External factors

External factors are commonly related to available facilities and teacher support systems which should be handled by the institution or even the government. Johnson et al. (2016) explained that external factors involved progressive transformations in the school system covering access to technology in sequential order (one level at a time). These factors include limited accessibility and inadequate professional and peer support.

Accessibility. The availability of essential instruments such as hardware, learning software, and fast internet connection is necessary for the successful integration of educational technology. Hepp et al. (2015) emphasized the significance of the school infrastructure for supporting better communication technology and enhancing access to information. However, the limitation of the quality, quantity, and availability of access to educational technology in many institutions worldwide still exists as one of the first barriers that can still be found aside from an indication of improved access to educational technology in the last two decades (Johnson et al., 2016; Hepp et al., 2015). Thieman and Cevallos (2017) argued that schools in some particular areas cannot provide a sufficient number of computers to use for instructional purposes. The limited access to the computer lab or the limited number of tools such as computers, projectors, and audio systems to use in class might decrease the feasibility of intensive use of educational technology. Therefore, teachers might not be able to formulate optimal technology-supported activities in their lesson planning due to the inconsistency of the access to technology (Johnson et al., 2016). Furthermore, Johnson et al. (2016) claimed that the current state of technological access in various parts of the world cannot be considered adequate to accommodate optimal

learning practices. A survey conducted by the Consortium for School Networking (2016) found that 81% of school systems have met the necessary support for educational technology connection. Despite the substantial development since 2013 with only 19% of schools unable to achieve the target, there is still some space for development.

In an ideal setting, technology should be incorporated in class to present individualized instruction that suits students' unique characteristics. Chung et al. (2016) asserted that individualized instruction is strongly desired in the application of educational technology. However, the limited access to technology remains one of the primary issues for this type of instruction. To overcome this issue, experts propose a strategy of Bring Your Own Device (BYOD) which allows students to use their own devices in class for learning purposes (Afreen, 2014). This strategy can be a potential option that overcomes the issue of accessibility through cost-cutting benefits. Regarding this strategy, Gil-Flores et al. (2017) and Afreen (2014) suggested that schools provide a network infrastructure to support the connectivity of students' devices and guarantee the security of the internet connection.

Professional and peer support. The next influencing factor of technology integration deals with support from peers or professionals. Teachers are expected to make their best effort to integrate technology for instructional purposes. However, many teachers still lack the necessary competence to operate the educational technology in their classes (Krumsvik, 2014). For this reason, special training from professionals should be facilitated in case schools or governments decide to enhance teachers' digital skills and expand the integration of educational technology. Ertmer et al. (2012) stated that insufficient training and professional support for teachers can potentially lead to teachers' unwillingness to adopt technology in their classes. Hubbard (2018) recommended a more extensive program for professional technology training to raise teachers'

confidence in utilizing educational technology. Also, as technology constantly develops new offered features that should improve its functions and practicality, teachers need to keep informed with the latest trend and upgrade their skills and competence by participating in the training of educational technology (Hicks, 2011).

The lack of resources to accommodate professional support for teachers might result in insufficient professional development that hinders the integration of educational technology. For this reason, professional training from experts is deemed necessary to support teachers (Hubbard, 2018). This idea will affect the school budget, but the positive impact will be significant for teachers. Technology experts will provide access to some prominent resources to prevent or solve possible issues with educational technology. Also, the improved notion and competence of technology will subsequently improve the positive perceptions, beliefs, and attitudes toward educational technology (Hepp et al., 2015).

The types of support to help teachers cope with the possible issues in the integration of technology in class are likely to develop along with the increased variants of technology and instructional strategies (Hubbard, 2018). Initially, teachers require technical support from experts in communication and information technology to adapt to new forms of technology. After the necessary skills to operate the new technology have been acquired, the next step is to provide support from their peers and possibly school administrative staff. With this support, teachers are expected to gain more confidence to use technology and become more encouraged to employ more strategies and tools to develop their class instruction. Teachers can also be encouraged to join forums and communities to participate in formal or informal discussions addressing innovations and other issues regarding educational technology (Ertmer & Ottenbreit-Leftwich, 2010).

Internal Factors

Aside from external factors, the existence of internal factors also determines the optimal integration of technology in the classroom. These factors are related individual's judgment and response toward the use of technology. They address the confidence and possible resistance to utilize educational technology.

Confidence in skills and knowledge. Teachers are given various options for selecting numerous options of the available technology in the market. However, using technology can be intimidating for those who do not have enough skills and knowledge. This case might occur for novice teachers. Piper (2003) surveyed 160 novice elementary and secondary teachers which lead to an indication of confidence issues as teachers were to utilize educational technology in their classes. The findings emphasized the importance of self-efficacy over the notions and competence of technology. In other words, it will be difficult for teachers to optimally harness technology if they are not confident with their competence (Fernández-Batanero et al., 2021).

To put it simply, effective teaching requires effective technology use. However, studies in various scales and schemes indicate teachers are still struggling to achieve high levels of digital skills for instructional use (Lohr et al., 2021; Jeong, 2017; Guillén-Gámez et al., 2020). Along with the advent of new technologies, teachers have certainly improved their digital skills for communication, administration, and other private or professional purposes Badilla Quintana et al., 2017; Lawless & Pellegrino, 2007). However, transferring their digital skills to utilize technology to develop their classroom instruction might not be an easy task, especially with their current administrative workload (Marwan & Sweeney, 2010).

A special concern is also directed to traditional or “old-school” teachers who are likely to avoid using technology in their classes. These teachers commonly lack competence and

experience with technology due to limited access or bad experience with technology. Also, their expectancy to manage their class without any risk of losing control among digital natives in a digital classroom is quite high. They might feel anxious to optimally use technology which limits their chance to develop their teaching practice (Gibson et al., 2014; Fernández-Batanero et al., 2021).

Resistance to Adopt Technology. Teachers have their respective considerations to accept or reject technology integration in their instructional practices. For instance, a sense of satisfaction with the current students' progress without the use of technology can be easily found among teachers (Johnson et al., 2016). As teachers aim to effectively manage their class, they will be reluctant to modify their lesson plans as they think that their current lesson plans are already effective to meet learning targets. Developing learning activities to help students achieve learning objectives and engaging them in an active scheme of learning requires hard effort and takes countless hours. Therefore, modifying the activities in the lesson plan can be a burdening task. Moreover, teachers might feel overwhelmed by the school or district regulation to modernize their classroom activities through technology. As a result, teachers might just use technology without proper application in their classes (Fernández-Batanero et al., 2021).

Even if teachers acknowledge the affordance of technology, developing a lesson plan to accommodate technology-assisted activities can be a challenging task. Regarding this matter, Cleaver (2014) addressed the "double innovation" issue referring to the need to get accustomed to technology and adjust the selected technology with learning goals and curriculum. Teachers need to carefully select the technology tools suitable for classroom situations, learning content, and learning objectives (Collier et al., 2004). Various forms of technology including teaching management systems and learning applications are available to support teachers. However,

deciding on the most applicable ones for their classes that are also suitable with curricula can be quite overwhelming for them. Also, teachers need to practice using these tools to alleviate any technical issues as they use them during the teaching-learning process (Fernández-Batanero et al., 2021). They might find some literature claiming that particular tools of technology can help students develop their competence and cognitive abilities. However, the real application might yield opposite results than the claims due to emerging technical issues or different learning circumstances which are not covered in previous studies.

Another issue regarding teachers' workload and duties should be taken into account in the discussion about the resistance to technology. Teachers dominantly spend their time preparing their teaching routine which is a typical element of the academician's duties. Without no concrete evidence of the potential benefits of technology for instructional practice, teachers might be doubtful to allocate a proportionately large amount of their time for practicing and being skillful with educational technology (Fernández-Batanero et al., 2021). Even the increased ease of use and practicality of the currently available technology might not be adequate to convince teachers to embrace technology for classroom use. Ertmer et al. (2012) mentioned in their study that teachers might find it difficult to manage their time to practice with new technology or to prepare technology-supported activities for learning purposes.

The theoretical frameworks of the study

This study adopted two theoretical frameworks comprising TAM and self-efficacy theory. Both theories complement each other as the primary elements of TAM (perceived usefulness and perceived ease of use of technology) are strongly correlated to technology self-efficacy (Pan, 2020). These frameworks were aligned with the study objectives and became the basis for data analysis.

Technology Acceptance Model (TAM)

The concept of the Technology Acceptance Model (TAM) originated from Ajzen and Fishbein's (1980) Theory of Reasoned Action (TRA). TRA explains the relationship between beliefs and attitudes and how it affects individuals' intentions to perform particular actions (Ajzen, 1991; Ajzen & Fishbein, 1980). This theory also postulates that intention serves as the main determinant as well as the indicator of an individual's attitude to respond to their surrounding phenomena (Sutton, 2001). Further, Ajzen (1991) argued that attitude connects personal beliefs and intention to perform particular actions. Subsequently, various efforts have been made to formulate and develop testing models as references to investigate and predict the attitude of individuals toward using technology. Of all available models, TAM, which was proposed by Davis (1989), has been widely acknowledged to measure individuals' perceptions and attitudes toward technology (Abdullah, Ward, & Ahmed, 2016; Jeyaraj et al., 2006).

TAM is specifically developed for investigations involving the use of technologies (Davis et al., 1989). This model highlights the significance of perceived usefulness and perceived ease of use as the key motivational elements for the acceptance of technologies. It further explains that a positive attitude toward the technology is manifested if users positively view the technology as useful and easy-to-use tools (Davis, 1989). A causal connection exists between perceived usefulness and perceived ease of use. Substantially, perceived usefulness of technology and perceived ease of use strongly influence the intention and attitude to use technology (Davis, 1993). Perceived usefulness refers to the degree to which the technology information positively empowers an individual to perform particular tasks, while perceived ease of use refers to the extent to which an individual is certain that technology can be operated with minimum effort (Lederer et al., 2000). However, Jeyaraj et al. (2006) explained that perceived

usefulness reflects the individual's intention to use technology as the strongest predictor followed by perceived ease of use. This argument is further supported by various studies (e.g. Saadé, & Bahli, 2005; Padmavathi, 2016; Hamid et al., 2016) which provide evidence of how these two elements-- perceived ease of use of the technology and perceived usefulness-- should be the main focus in observing individual's use of technology. Furthermore, aside from these two elements, TAM also includes several external factors comprising personal differences, the nature of technology, social impacts, and facilitating circumstances that interfere with the individual's perceptions and behaviors (Abdullah & Ward, 2016). As a result, the application of TAM has been extensively found and acknowledged in various educational settings (Marangunić & Granić, 2015; King & He, 2006) implying the essence of users' attitudes as a key determinant of an individual to utilize technology.

Thus far, TAM has been extended as it has undergone several transformations with the inclusion of variables that describe an individual's excuses to accept and reject new technologies (Marangunić & Granić, 2015). Wixom and Todd (2005) suggested several approaches that are applicable to extend TAM including introducing factors from related models, introducing supplementary or substitute belief factors, and examining qualifications and mediators of perceived practicality and perceived ease of use. The extended TAM features an indicator of variables affecting individuals' intention to utilize a particular form of technology, analyzes predictive factors beyond TAM, and measures the probability of acceptance of technology (Shih, 2004). Legris et al. (2003) suggested that TAM managed to reveal various external variables while several studies could describe more than 40% of the variance in the adoption of technology.

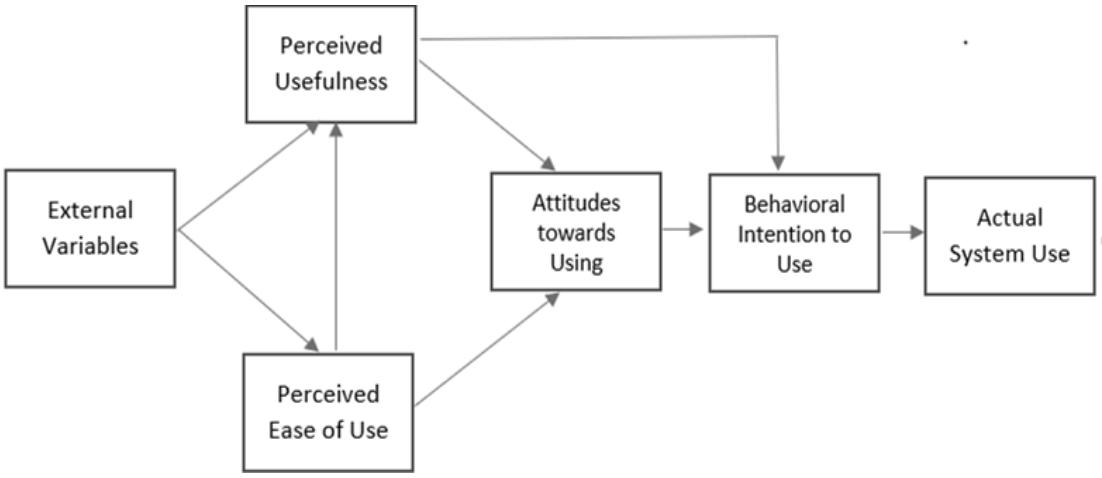

Figure 2. The Technology Acceptance Model (Davis, 1989)

Studies on information technology employing TAM found that the effectiveness of the adopted system relies on user attitudes (Siyam, 2019; Ros et al., 2015). These attitudes reflect a connection between the user and the system. Chen-Hsieh et al. (2017) examined the acceptance and perceptions of the mobile messaging application LINE in a flipped classroom setting. This study followed a total of 42 Taiwanese EFL undergraduates who received treatment with this mobile application in a flipped classroom setting. This study adopted a mixed-method approach and employed various instruments to collect data comprising oral proficiency tests, the TAM questionnaire, and semi-structured focus-group interviews. The findings indicated acceptance of the flipped classroom model through the mobile messaging application LINE. It was also concluded that LINE managed to improve the effectiveness of the flipped classroom model indicated by the significantly higher result of the speaking tests. This application allowed students to interact and work with their peers or communicate with the instructor to get additional guidance after classroom hours.

The application of TAM was also found in studies by Tsai (2015) and Teo et al. (2008). Tsai (2015) conducted a quasi-experimental study to evaluate the application of a Blackboard (Bb) course management system (CMS) to teach English writing. The TAM survey revealed that

the majority of the subjects showed positive perceptions and attitudes during the learning process. The author posited that the positive perceptions were directly influenced by students' perceived usefulness, perceived ease of use, and positive attitudes toward a Blackboard (Bb) course management system. In addition, the study identified technical support as the prominent external variable that affects students' perceptions. Similarly, Teo et al. (2008) applied TAM to 239 preservice teachers enrolled at the National Institute of Education in Singapore and confirmed the intertwined elements of perceived usefulness, perceived ease of use, and subjective norm which are prominent in performing attitudes toward the use of computers as an instructional tool. This study highlights the subjects' perceived ease of use which serves as a direct influencer for forming subjective attitudes. Also, both facilitating conditions and subjective norms were viewed as external variables which indirectly influence an individual's performance and subsequently expand the framework of TAM.

In the present study, TAM became a foundation to explore EFL preservice teachers' beliefs and attitudes toward mobile technology for language learning and instruction during their teacher education program at the university. According to TAM, an individual's beliefs toward technology can be predicted from his/her attitude and intention to utilize that technology. Also, perceived usefulness and perceived ease of use determine individuals' attitudes toward ICT (Ajzen, 1991; Davis, 1989). It means positive beliefs that harnessing educational technology can make positive contributions to the development of students' competence and performance are deemed necessary to optimally utilize technology in education. For these reasons, TAM is regarded as a suitable model for this study as it has the potential to reveal individual beliefs and attitudes toward mobile technology for language learning and instruction along with influencing

variables that both motivate or demotivate EFL preservice teachers to harness mobile devices during their teacher preparation program in the university.

Self-Efficacy Theory

Self-efficacy theory was first introduced by Albert Bandura (1977) within the scope of the social cognitive theory. This theory addresses the idea that experiences in performing tasks that result in a particular skill or competence can generate a therapeutic transformation within individuals (Schunk & Dibenedetto, 2016). This theory also highlights the essence of individuals' self-perceptions of their respective potential and competence which regulates how actions are performed and thus leads to the expected outcomes of the actions (Maddux, 1995). Based on this theory, it is assumed that every individual possesses unique abilities and skills that can be potentially harnessed to gain success for their actions. Additionally, the main concern of self-efficacy theory lies in the effort to assist individuals and societies to achieve the feeling of control or sense of agency that contributes to goal attainment (Schunk & Dibenedetto, 2016). Pajares (2006) posited that beliefs and confidence that every action can lead to desired results are necessary to build attitude and perseverance to overcome any possible hindrances. Bandura (1977) further asserted that self-efficacy refers to individuals' beliefs in their ability and competence which may lead to either an optimistic or pessimistic way of thinking.

Self-efficacy theory posits that the development of self-efficacy is reliant upon four primary sources of information input (Staples et al., 1999; Bandura, 1977). In terms of the strengths of influence, these sources can be arranged in a particular order from enactive mastery, vicarious experience, verbal persuasion, to physiological arousal. Enactive mastery refers to information that is acquired concerning an individual's accomplishment. It can positively or negatively affect an individual's self-efficacy depending on the nature of the accomplishments

(success or failure). Vicarious experience concerns individuals' images based on their observation of particular actions conducted by others. This type of information develops an individual's motivation to perform better by learning from other individuals' experiences. Verbal persuasion refers to suggestive information which encourages an individual to perform successfully in completing particular tasks or duties. This information is commonly given by experts or professionals in coaching clinics and seminars. Physiological arousal refers to an individual's capability to evaluate the difficulties of particular tasks and complete them which is affected by the impacts of those tasks (Staples et al., 1999; Bandura, 1977).

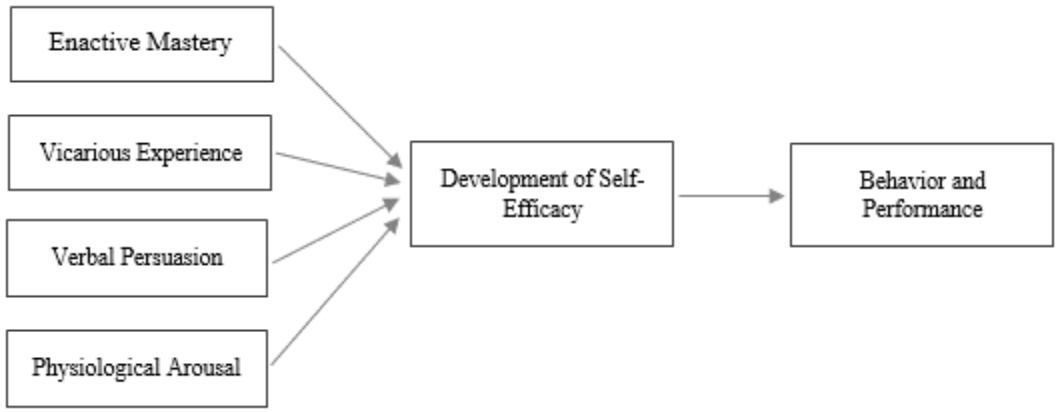

Figure 3. Sources of Self-Efficacy (Bandura, 1993)

Aside from self-efficacy, it is also important to note that successful outcomes also rely on available opportunities. According to self-efficacy theory, the available opportunities hold the key to success to acquire the expected competence and achieve high levels of self-efficacy (Bandura & Adams, 1977). Therefore, this theory does not postulate individuals' superiority due to their current success and views individuals with their respective potential in an equal manner (Purzer, 2011). This theory also mentions the likelihood of phobic behavior which is prominently affected by the individuals' self-efficacy instead of their expectations of success. According to

Bandura (1977), the level and intensity of self-efficacy can be enhanced through various efforts considering its reliance on other factors.

Bandura (1977) indicated that various factors possess significant roles to determine the successful outcomes of particular actions. Substantially, the self-efficacy theory posits that successful outcomes involve an intertwined correlation between personal factors, attitudes, and situational factors. Self-efficacy itself is perceived as an emotional state manifested by these outcomes. It is individually formed by how inputs from these factors are interpreted (Burke et al., 2009). Furthermore, the theory emphasizes the significance of individuals' awareness of their potential which contributes to information processing. For assigned tasks, individuals will measure their abilities and the difficulty levels of the tasks and they will decide their actions and make the required effort to complete the tasks. In this case, the outcomes of actions, either successes or failures, are also reliant on the level of difficulties that the task exposes, the perceived weight to complete the task, and the temporal sequence of their successes and failures (Lorsbach & Jinks, 1999).

A study displaying the significance of self-efficacy was conducted by Alrabai (2018). This study delved into the relationship between students' self-efficacy in learning English and language skills. The quantitative study recruited 221 EFL undergraduate students from a university in Saudi Arabia. The data were collected through a questionnaire and language performance tests which assessed four language skills (listening, speaking, reading, and writing). The analysis indicated low overall self-efficacy beliefs about learning the English language among the majority of the subjects who were identified to be low achievers. The findings showed that there was a positive correlation between students' English self-efficacy and their language

learning achievement. It further concluded that the development of language skills is strongly influenced by learners' self-efficacy and positive beliefs about their language learning process.

Conclusion

This chapter presents the literature review regarding the application of mobile technology for language learning and instruction. Initially, an overview of educational technology is presented to describe the current progress of technology in the field of education and the contribution of technology to the development of instructional practice. As technology develops, experts and teaching practitioners have shifted their attention to mobile technology which offers portability and connectivity. The term Mobile-Assisted Language Learning (MALL) emerged as the manifestation of this idea in the area of language learning and instruction.

Beliefs and attitudes toward technology determine the success of the integration of technology into classroom instruction. Adukaite et al., (2017) asserted that beliefs are manifestations of social interaction and personal experience. Failure to identify teachers' beliefs about technology might lead to the inability to comprehend the influencing factors for adopting or discarding the technology plans (Cho & Littenberg-Tobias, 2016). As for attitude, this construct refers to a particular judgment on a specific phenomenon or item. This judgment is established on the basis of a complex of beliefs reflecting personal feelings, opinions, prejudice or bias, and perceived concepts about particular themes which tend to be consistent and permanent (Triandis, 1971). Shifflet and Weilbacher (2015) stated that teachers' positive attitudes toward technology are necessary for successful technology integration.

This chapter further explains the influencing factors in the integration of technology. From the literature, these factors were classified into two categories: external and internal factors. External factors are commonly related to available facilities and teacher support systems

which should be handled by the institution or even the government. Internal factors are related individual's judgment and response toward the use of technology. They address the confidence and possible resistance to utilizing educational technology. To complete this chapter, I also present the explanation of TAM and self-efficacy theory which serve as the theoretical frameworks of this study.

Chapter III: Methodology

Introduction

This chapter explains the methodological framework that is utilized for data collection and analysis. Specifically, it provides detailed information regarding the research approach, the selection of participants, the instrument, the procedure of data collection, the data analysis procedure, and the quality factors of the adopted methodology.

Research Questions

Focusing on EFL preservice teachers' beliefs and attitudes regarding the implementation of mobile technology learning and instructional tools during their study in the university, the following questions serve as guidance to comprehend the structure of the study:

1. What do EFL preservice teachers believe regarding the application of mobile technology for language learning and instruction during their teacher preparation program?
2. What attitudes do EFL preservice teachers demonstrate toward the application of mobile technology for language learning and instruction?
3. What factors affect these beliefs and attitudes?

Nature of the Study

This study adopted a qualitative method to investigate situations, phenomena, or dilemmas resulting from interactions among humans and surrounding objects within particular social contexts in which those interactions occur (Flick et al., 2004). Creswell and Poth (2016) emphasized the application of a qualitative method for unmeasurable variables which allows researchers to propose their axiological assumptions to the data interpretation. Additionally, qualitative studies serve as a means to comprehend the connection between people and their surroundings including their beliefs and attitudes in a comprehensive way. Moon et al., 2016;

Glesne, 2011). Miles, Huberman, and Saldaña (2014) claimed that this method can lead to corroborated, rich descriptions, and explanations of identifiable processes of social interaction. This method is suitable for this study since the topic has recently attracted attention from educational experts and researchers so that supporting theories do not sufficiently exist (Moon et al., 2016). Besides, the research issues cannot be quantitatively analyzed, and there are some issues with sampling adequacy (Hesse-Biber & Leavy, 2011).

Furthermore, this study employed a phenomenological approach to provide insight and elaborated descriptions of the individuals' shared experiences on a particular phenomenon (Creswell & Poth, 2016). The primary objective of this approach is to analyze individual experiences with a phenomenon and diminish the existing gaps to formulate a more collective description of the experience (Van Manen, 1997; Creswell & Poth, 2016). Therefore, this phenomenological study allowed me to be more conscious of the nature of the emerging phenomenon within the scope of mobile technology application in the higher education context.

The reviewed literature in the previous chapter reflects the limited number of studies that have been directed to examine the application of mobile technology and its impacts on the affective domain. Cheon et al. (2012) suggested additional studies to examine the integration of mobile technology by incorporating multiple perspectives to cover various considerations for utilizing or ignoring this technology. A qualitative method and phenomenological approach designs are suitable for this study to provide deeper insight into the potential of mobile technology. The study might reveal some consistent findings as found in the previous studies or new and unreported findings by previous studies. For this reason, this study is expected to provide additional information regarding mobile technology application in a teacher preparation program by describing beliefs and attitudes of EFL preservice teachers regarding the

implementation of this approach. Thus, this study included an in-depth analysis of participants' thoughts and ideas which potentially serve as a reference for future studies on the integration of mobile technology.

Participants of the Study

Adopting a qualitative study method, a small number of participants were recruited to share their experiences in using mobile devices in their EFL classes. Creswell (2008) asserted that qualitative studies are designed to investigate the complexity of certain phenomena. It requires an in-depth analysis of a large amount of data which poses researchers particular challenges to collect. Therefore, qualitative research commonly recruits a small number of participants (Creswell, 2008).

The samples in this study were selected using purposive sampling due to the nature of the study. It recruited EFL preservice teachers or fourth-year undergraduate students majoring in English education from a private university in Indonesia. Since all participants were in their designated final year of study, they have taken various linguistic courses and teaching-oriented courses as well as participated in teaching internships in high or middle schools during their program. Several courses were administered through an online platform "OnClass," which is based on the online learning template "Moodle." Students generally take four to six classes or eight to twelve credits in their fourth year and each class takes around 90 minutes depending on the class credit (1 credit = 45 minutes). Additionally, the majority of participants have similar backgrounds in terms of socio-cultural views as well as technological aptitudes making them a homogenous sample that is ideal for qualitative study (Creswell and Poth, 2016).

In terms of the participant number, Marshall, Cardon, Fontenot, and Poddar (2013) conducted a meta-analysis and found that the number of participants ranged from 10 to 30 with a

mean of 12. Polkinghorne (1989) in Creswell and Poth (2016) suggested that data collected through the interview might include 5 to 25 participants who experience the observed phenomenon. Based on the enrollment data of the fourth-year students, 50 students were registered as active students. Out of that number, 20 students were selected based on students' responses and their willingness to join the study after being informed about the study and receiving the consent document via email. These participants consisted of 17 females and 3 males aged 21 to 23 years old. In terms of digital skill levels, one participant claimed to be "very proficient" with mobile technology, 10 participants stated that they were "proficient," and 9 participants claim to be "moderate."

Instruments of the Study

The selection of the instruments for this study was based on the research questions, scope, and goals as well as other restrictive factors such as the limited duration of the study and the involved participants of the study. The available option for the instruments of data collection also relies on the adopted approach and the circumstances under which the study was carried out (Robson, 2011). Creswell and Poth (2016) highlighted the roles of interactivity and humanistic elements in qualitative data collection implying the need for actively engaging interaction with the participants. That way, participants were able to express their thoughts and views revealing in-depth information required for this study. Moreover, the elaboration of the belief and attitudes of the participants offer more saturated data (Alhinty, 2016).

Following the qualitative nature and phenomenological design employed in this study, The researcher used a semi-structured interview as the primary and sole instrument for data collection. This instrument allowed a more flexible and less formal model of interaction during the process. However, it requires collaboration and support from the interviewee to build mutual

understanding which allows the researcher to gather the required data effectively (Alhinty, 2016). This instrument serves an essential role in a phenomenological study as a useful method of collecting data specifically when dealing with unobservable behaviors and attitudes (Yin, 2009; Creswell, 2008). Additionally, it can be adjusted with the setting or participants of the study (Robson, 2011). Creswell (2008) explained that an interview can be an instrument to gather useful data through the inclusion of open-ended questions that further revealed the reasons for the received responses. This discovery-oriented design allows for research discovery during the occurring communication while following thematic routes (Magaldi & Berler, 2020).

The questions were constructed in an open-ended format which allowed the interviewee to express their opinions, thoughts, and perspectives in a less restrictive fashion compared to a close-ended format (Chenail, 2011). There were 22 questions for the interview which explore their beliefs toward mobile technology as a learning support instrument (n= 5) or an instructional tool (n= 8), and their attitudes toward mobile technology as a learning support instrument (n= 2) or an instructional tool (n= 1), and factors affecting EFL preservice teachers' beliefs and attitudes toward mobile technology (n= 6). The complete set of questions is attached in appendix 1. These questions were developed, modified, and reformatted from the research questions in previous studies (e.g. Lee, 2019; Triplett, 2018; Mthethwa, 2015; Mancilla, 2014). Specifically, all these questions were considered to reflect the elements in both TAM and self-efficacy theory which describe beliefs, attitudes, and factors that affect both beliefs and attitudes. In addition, I included four questions regarding participants' demography: gender, age, length of use of mobile devices, and proficiency level.

Table 1
Samples of interview research questions

Research variables	Number of questions	Question samples
Beliefs	13	Q6. How has using a mobile device helped (or has not helped) you learn English? Q7. How easy/difficult is it to use mobile devices to learn English? What makes it easy/difficult?
Attitudes	3	Q18. Knowing the benefits and challenges of MALL, how will you use your current mobile devices for learning English? Why?
Factors influencing beliefs and attitudes	6	Q23. What experience do you have in using your mobile device(s) for any of your classroom activities? (If any)

Data Collection Process

I started my data collection process in September 2021 after I received permission to collect data from the Institutional Research Board (IRB). The data collection process took approximately one month including transcribing and translating the collected data. Once the data was ready, I started analyzing my data through a manual procedure to extract the most prominent aspects of the findings and later NVivo 10 software for further analysis. There were two stages of the data collection process which I can summarize as follows:

Recruitment

The process to gain permission was relatively short due to my prior connection with the involved institution. I first contacted the head of the department to explain my study and obtain permission to collect data in her institution. I explained the outline of the study and the participants necessary for it. After obtaining the permission, she connected me to the class coordinators to collect potential participants that met the requirements for the study. I received a list of 50 students, twenty of whom were later selected as the participants of the study with a lottery. The recruitment process was quite straightforward as all participants had been contacted by their class coordinators who briefly explained the outline of my study. Next, I requested study approval from the IRB committee. This committee issued the informed consent that was

distributed and completed by the participants indicating their willingness to participate in the study.

The University of Arkansas requires all researchers to obtain approval from the IRB committee to gather data from human participants. This approval is necessary to ensure that the participants are not exposed to any harm or danger during the study. However, it was not an issue for this study considering no direct or indirect risk is exposed from joining the study for the participants aside from the need for allotting time to schedule the interview meetings and potentially follow-up clarification meetings. They could also refrain from being involved any further during the study in case they were not willing to continue. The study also guaranteed the confidentiality of the personal identity of the participants by properly storing the data and providing a randomization code to identify participants during the study to the degree allowed by law and university policy. Both data and code were accessible by the researcher. The data and related information that could potentially reveal the participants' identities were also terminated after the study was completed.

Upon receiving IRB approval, I contacted each participant through WhatsApp chat to set up a schedule for the meeting. During the chat, I briefly explained the procedure of data collection and sent a copy of the informed consent that needed their signature upon approval as well as the interview questions. I asked also about their preferable meeting platform and also the language we would use for the meeting. All participants preferred to use ZOOM as the meeting platform and the Indonesian language as the medium of the interview. The participants were also allowed to ask any questions regarding the interviews.

The interview Process

The interviews with the participants were conducted via the ZOOM platform. All participants allow the interviews to be recorded. Each interview lasted for 35-45 minutes. The interview was recorded with the consent of the interviewee. The recordings were saved as MP3 and MP4 files. In one interview, there was an issue with the internet connection and another platform, WhatsApp, was used. From this interview, I saved the file in an MP3 format only. At the end of the interview, participants were allowed to ask questions regarding the interview or the study in general. Later, I contacted them through WhatsApp chat to ask one additional question as a follow-up regarding the role of collaborating teachers during their student-teacher program. The participants immediately responded to my questions.

Data Transcription and Analysis

The study provided a descriptive summary of participants' backgrounds including any outliers in the form of demographic data to enable transferability. This information was used to explain the coverage of the study and had no direct connection with any procedures during data analysis. Morse (2008) noted that the inclusion of demographic information in qualitative studies served as complementary data that increased the degree of generalisability. Data included age, gender, and devices to access learning.

All students' responses during the interview were compiled and summarized in a researcher's journal once the interview was completed. The recording was also rechecked to identify any missing information and avoid misinterpretation. To maintain the confidentiality of participants, a list of the transcribed response was made and any outliers that become identifiers were deleted. The data interpretation was conducted carefully to avoid referring to any particular participants. In addition, to ease the readability of transcription, clean verbatim transcription was

generated by removing fillers and interjections while maintaining the essential information from the audio files.

Participants were asked to clarify the information on the transcribed response to make sure that the transcription was acceptable and avoid misinterpretation or error in the transcriptions after the interview transcriptions were ready (Morse, 2015). This process was instantly completed as all participants responded immediately within hours. Once the scripts were verified, I manually translated the scripts and concluded the process of data collection. During the translation process, I used Google browser and Google Translate to find the meaning of difficult words. I initially intended to involve a third party to help me check the results of the translation. However, due to the pandemic situation, this idea could not be realized and the translation was done by myself. I also sent the translated transcriptions to the participants and asked them if they found any misaligned information with the original transcriptions. All participants agreed that the translation was appropriate. Finally, I completed the final data with some additional information from hand-written notes taken during the interview sessions.

Data analysis in this study was a process of finding a link between the collected data and elements of mobile technology for learning and instructional purposes as well as students' experience and perceptions as they got engaged in mobile technology-based activities. This process included a sequential procedure to divide data into small portions, make a comparison, and find a contrast between them (Merriam & Tisdell, 2016). Data were arranged in a logical order, classified into specific groups through coding, and carefully examined to reveal a specific pattern that explained the connected variables in the mobile technology application and preservice teachers' beliefs and attitudes. Merriam and Tisdell (2016) stated that data should be

broken down into small segments that they can stand on their own to make them more manageable to analyze.

To support data analysis, the researcher used NVivo 10. This software is developed to help to organize and find any connections of variables existing from the data. It also offers a feature to save various types of data of any format in a specific location on an internal hard disk which helps the researcher to work on a complex and time-consuming data analysis.

The analysis of transcribed data adopted a two-cycle coding which is proposed by Saldaña (2013). The initial coding which can be referred to as open coding employed an open-ended approach to analyze literature data with the possible inclusion of multiple coding methods (Onwuegbuzie, Frels, & Hwang, 2016; Saldaña, 2013). This coding includes a selection of single words, sentences, or paragraphs on the transcription and can be utilized both within and across-literature data analysis (Onwuegbuzie, Frels, & Hwang, 2016). Moreover, this first cycle of coding protocol served as the foundation for analysis which includes a variety of coding methods.

Shifting from the first cycle coding to the second cycle coding can be quite complex. Therefore, it might be necessary to use a review of the findings by reorganizing and reconfiguring the converted data. In this case, the second cycle decreased the number of codes in the first cycle as the codes are classified under the same topic. This cycle was further sorted and relabeled to find the best classifications for each code. Using axial coding for the second cycle, the researcher attempted to find connections between codes that had been developed during the first cycle as well as create new codes to cover two or more similar codes. Saldaña (2013) asserted that axial coding serves as a transitional cycle between the Initial and Theoretical Coding processes, though the method has become somewhat questioned in later writings. There

is a possibility the data analysis process during the second pass was reverted to the initial coding process with different coding strategies to extract more information required for the analysis (Saldaña, 2013).

Positionality

Considering the nature of qualitative studies which involve subjectivity, it is necessary to explain the positionality of the researcher. Holmes (2020) stated that positionality explains individual perspective and their decision to put themselves in a particular position to complete their roles in a study. It means that the quality of the data relies on views, competence, and expertise. Therefore, I was careful with my subjectivity which is likely involved in data analysis. Regarding this study, I position myself as the researcher as well as the instrument that conducts data collection. My relationship with the related institution gives me ease of access to recruiting the participants of the study based on the predetermined criteria.

As a researcher, my background knowledge and experience in teaching give me a sense of optimism that I could gain a better understanding of my surroundings. I have acquired both bachelor's and master's degrees in English education and have been interested in conducting studies in the area of English as a Foreign Language (EFL). I have also been working in this area for years and have collaborated with many EFL experts and practitioners in various academic forums and pedagogical training. I am also confident that I am highly proficient in associated technology for language teaching and quite aware of the current hindrances to the field implementation. This confidence is a valuable asset for me to explore the recruited participants' beliefs and attitudes toward mobile technology for language learning and teaching purposes. Moreover, all of my experiences and beliefs in the educational field allow me to be more sensitive and critical in the research area I am focusing on.

The main issue in data interpretation of qualitative research is my own bias. Creswell and Poth (2016) suggested describing the researcher's perceptions, experience, expectations, and bias as they affect the data analysis and interpretation in a study. Positioning as the main instrument for the data collection, the researcher views the study through his/her lens which subsequently involves his/her own bias (Yin, 2015). Additionally, I have total control over the findings and outcomes of the research. Therefore, the selection of research instruments might affect the quality of my interpretation. Using a semi-structured interview to gather the participants' beliefs and attitudes, I needed to pay attention to my attitude so that the participants might not be influenced and give their best responses. The guiding questions should also be checked by the experts and later validated to avoid any biased questions.

Quality Factors of Qualitative Studies

The validity and reliability of the study rely on the application of each element of this study and the connection between them. In a qualitative study, the concept of both validity and reliability can be quite vague due to the unavailability of instruments with a well-developed measurement system to calculate the level of validity and reliability. Therefore, it was relevant to address issues of credibility, confirmability, and dependability which subsequently establish the concept of trustworthiness for a qualitative study.

Trustworthiness. A qualitative study includes a certain degree of subjectivity which determines the quality of the employed methodology. This quality concern is often referred to as the research trustworthiness which addresses the degree of validity of qualitative findings (Creswell & Poth, 2016). Polit and Beck (2014) defined trustworthiness as the extent to which the data, methods, and analysis procedure can confidently guarantee the quality of a study. Nowell et al. (2017) stated that the criterion of trustworthiness depends on researchers perceiving

the values and practicality of their studies for a diverse range of stakeholders. Creswell and Poth (2016) further asserted that trustworthiness is related to ethical and substantive validation addressing ethical assumptions that encase a research effort and any relevant support from existing studies. Ethical validation itself is a function of the researcher's moral assumptions, and substantive validation is a function of a researcher's readiness to carry out a study. Lincoln and Guba (1985) explained the concept of trustworthiness as a means used by researchers to assure themselves and readers that the study is worthy of attention. They also explained the measures of credibility, transferability, dependability, and confirmability as a subsection of trustworthiness referring to the measures of reliability and validity of quantitative studies.

Trustworthiness is a criterion to assess the credibility or the confidence of truth of a qualitative study (Polit & Beck, 2014). Considering the significance of this criterion, several methods that can potentially enhance this criterion were used in this study: utilizing a suitable instrument to gather data, providing details of the research protocol, and presenting reflexivity to decrease the perceived influence of the researcher.

Credibility. Credibility refers to the extent to which a study can present accurate and trustworthy findings. It can be simply considered as a truth value (Lincoln and Guba 1985). Credibility originates from the formulated objects of the study which are bound by a consistency that is exposed by the research decision (Patton 2002). Cope (2014) asserted that credibility can be strengthened by presenting clear and detailed information regarding methodologies that can be easily understood by the readers. Additionally, Forero et al. (2018) used several strategies to improve credibility in their study such as prolonging and varying involvement with the research participants in each setting, refining the interview process through one or two pilot studies, building researchers' authority, collecting sufficient references, and holding brief debriefing.

Connelly (2016) suggested using audit trails and negative case analysis as instruments to address credibility. Both audit trails and negative case analysis also address the issue of confirmability suggesting the neutral position of the researcher. In this study, the credibility of the study was achieved through various efforts. Participants were given detailed information about the project that they needed to know. They became familiar with the researcher, objectives, potential benefits, and risks so that they could be comfortable uttering honest responses to the given questions.

Confirmability. Confirmability addresses the issue of neutrality expressed by researchers to interpret the findings in a qualitative study. Guba (1981) stated that a high degree of confirmability can be achieved as researchers present the results of the study based on the response from the participants under a particular circumstance with the exclusion of personal beliefs, motivations, views, and bias. The researchers may expect the readers to approve the confirmability of the study by providing a report on methodological description and the reasons for selecting theoretical, methodological, and analytical options of the overall study, (Shenton, 2004; Koch, 1994). Miles and Huberman (1994) recommended the inclusion of the researcher's reflexivity that explains his predisposition, beliefs, and assumptions, i.e., ontology and epistemology. The reflexivity helps in providing impartial data analysis and formulating the outcome of the study by explaining how researchers position themselves (Moon et al., 2016). To establish the confirmability of this study, I provided an audit track that highlights the methodological description I used in analyzing data. This audit track explained the rationales for each procedure taken in the study and described how the results of the study precisely represent the participants' answers. It also demonstrated how the conclusion was established based on the analysis which allowed replication for future studies.

Dependability. Dependability can be defined as consistency and stability in all elements of a qualitative study that allows replication of similar findings in another study under a similar context (Connelly, 2016). Shenton (2004) highlighted the need of providing comprehensive documents of research methodology including a detailed explanation of the research design, instruments for data collection, and reflective evaluation of the study. This information can be an indicator that the study is properly conducted. Similarly, Cope (2014) claimed that presenting comprehensive details of research methodology assures a justifiable result, as there is a high possibility that another similar study yields a similar result by recruiting participants with similar characters under a similar context. D'Cruz et al. (2007), Tong et al. (2007), and Moon et al. (2016) asserted that researchers need to be transparent in terms of research procedures to alleviate possible bias and elevate dependability. For that reason, I needed to include reflexivity which is a self-examination of subjectivity demonstrating self-awareness. In this qualitative study, the degree of dependability heavily relied on the transparency of the methodology combined with the identified context (mobile technology application) and participants (preservice EFL teachers). Finally, any details about revisions and improvements to the research procedure were documented and reported to sustain the dependability of this study.

Chapter IV: Presentation and Data Analysis

Introduction

This chapter presents the findings of data collection and analysis of these findings. The chapter starts with an overview of the study. I explain the stages in the data analysis carried out through NVivo 10 which generated several themes related to beliefs and attitudes toward mobile technology. From these themes, an elaborated discussion is presented to answer each research question. To close this chapter, the conclusion of the findings is provided.

Overview

This study focuses on the application of mobile technology for language learning and instruction. This technology offers portability and accessibility which promote personalized learning. Moreover, the related literature presented various findings that indicate the affordances of this technology by broadening learning connectivity, developing students' learning motivation, and improving teachers' creativity in teaching. Also, the application of mobile technology for class instruction continues to develop as a new trend in the educational field due to the increased accessibility among students to this technology.

Understanding beliefs and attitudes of EFL preservice teachers toward mobile technology for language learning and instruction is deemed necessary in the attempt to support the future adoption of this technology for EFL instructions. Therefore, I conducted this study to achieve the following objectives: First, this study describes beliefs and attitudes of EFL preservice teachers toward mobile technology for language learning and instruction during their teacher preparation program. Second, the influencing factors that determine preservice teachers' beliefs and attitudes toward mobile technology for language learning and instruction are elicited as a part of the

discussion to formulate possible implications to improve its application in future instructional practices.

Data Analysis

The interview questions were specifically categorized based on the area of investigation which was reflected in the research questions. The questions attempted to uncover the participants' beliefs and attitudes as well as the factors influencing these constructs. Specifically, the first thirteen questions were developed to answer the first question which deals with the participants' beliefs about mobile technology for language learning and instruction. The next three questions for the second research question concern the attitudes toward mobile technology for language learning and instruction. The last six questions were aimed to answer the third research question focusing on the factors affecting beliefs and attitudes toward mobile technology for language learning and instruction. Additionally, due to the semi-structured format of the interview, additional questions emerged during the interview to verify or clarify particular responses from the participants. Finally, the emerging themes or codes from the participants' responses might overlap the categories they were initially designed for to provide a more comprehensive explanation for the analysis.

Overall, the data analysis adopted a two-cycle coding proposed by Saldana (2013). The initial cycle included a selection of single words, sentences, or paragraphs on the transcription. The first cycle of coding protocol served as the foundation for analysis which included a variety of coding methods. The second cycle decreased the number of codes in the first cycle as the codes were classified under the same topic. This cycle was further sorted and relabeled to find the best classifications for each code. This two-cycle coding analysis was included in the four stages of thematic formulation. During the process, I manually coded the responses and

employed qualitative analysis-specific software. The stage of analysis is described in the following section.

Stage one. In this initial stage of formulating the themes, I printed the translated version of the interview scripts. All these scripts and translations had been verified by the participants. I thoroughly read the scripts and highlighted the important part of responses regarding beliefs, attitudes, and factors affecting both beliefs and attitudes.

Table 2
Code Formulation

Sample Responses	Codes
I often used my device to **translate words** and sentences and also practice my **pronunciation** skills.	Translation, Pronunciation
Also, mobile devices are quite compact and **easy to carry around**.	Portability
I do not think I have a problem with that as long as students can be **properly guided** to use their mobile devices. Instead, using mobile devices might be beneficial.	Guidance
Mobile devices can be utilized to share **class assignments** with students aside from accessing **instructional platforms** such as ZOOM, Google Classroom, and Schoology. Students can also use them to operate WhatsApp which substitutes the functions of the available instructional platform. For those sharing their mobile devices with their parents, it might be a good option.	Assignments, Platforms

***Stage two*.** I formulated codes from the highlighted parts and typed them into a word document. This document was later uploaded to NVivo 10 to organize the codes. Also, in this stage of the coding process, I could present data visualization as seen in the following figure. From the figure, the most frequently mentioned words were identified comprising learning content, access, Google (referring to Google Translate, Google Meet, or Google scholar), Internet, WhatsApp, and online class. This visualization also revealed a code “phone” which refers to mobile phones or smartphones, which served as the primary type of mobile devices used by the participants.

Figure 4. Word cloud of emerging codes

Stage three. The next analysis process was directed to organize the codes and formulate the emerging themes from the findings. By analyzing the word frequency, the codes were arranged and classified based on word generalization. The following treemap format presents the arrangement of codes based on the word frequency.

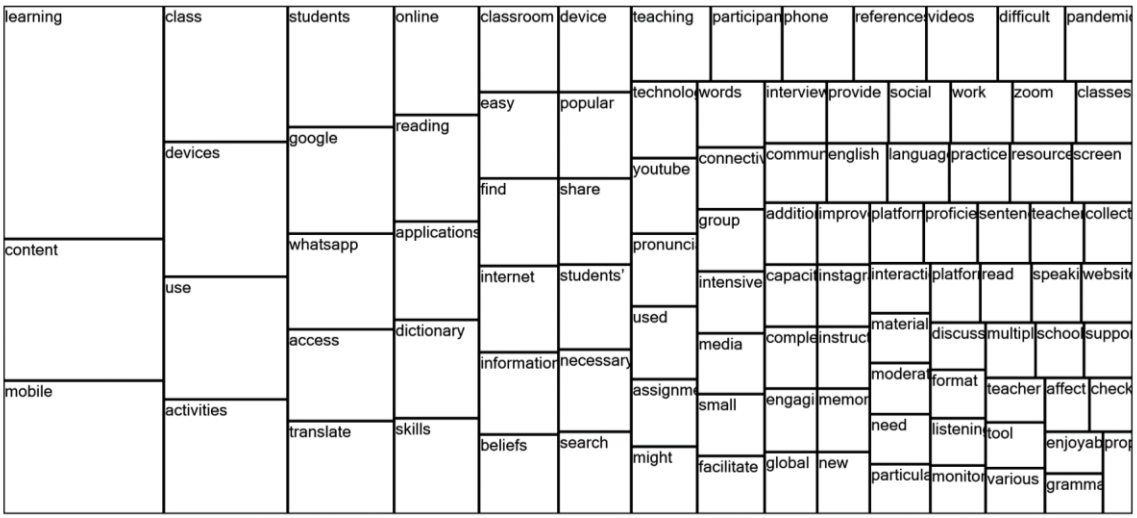

Figure 5. Treemap of word frequency

The next step was formulating the themes to respond to the research questions. For this purpose, I formulated the themes from the classified codes based on similarity, synonym, specialization, and generalization. initially, I classified the subtopics of the research questions to accommodate the points of view of participants as EFL learners and instructors. For instance, the first question concerned beliefs about the application of mobile technology. Thus, I categorized the response into two categories: beliefs about mobile devices for self-directed EFL learning and beliefs about mobile devices as instructional tools. For the category of beliefs of mobile devices for self-directed EFL learning, the themes included multifunctionality, personalized learning, and challenges (see figure 6). The next category regarding beliefs of mobile devices as instructional tools consisted of the usefulness of mobile devices, conditional application, and barriers.

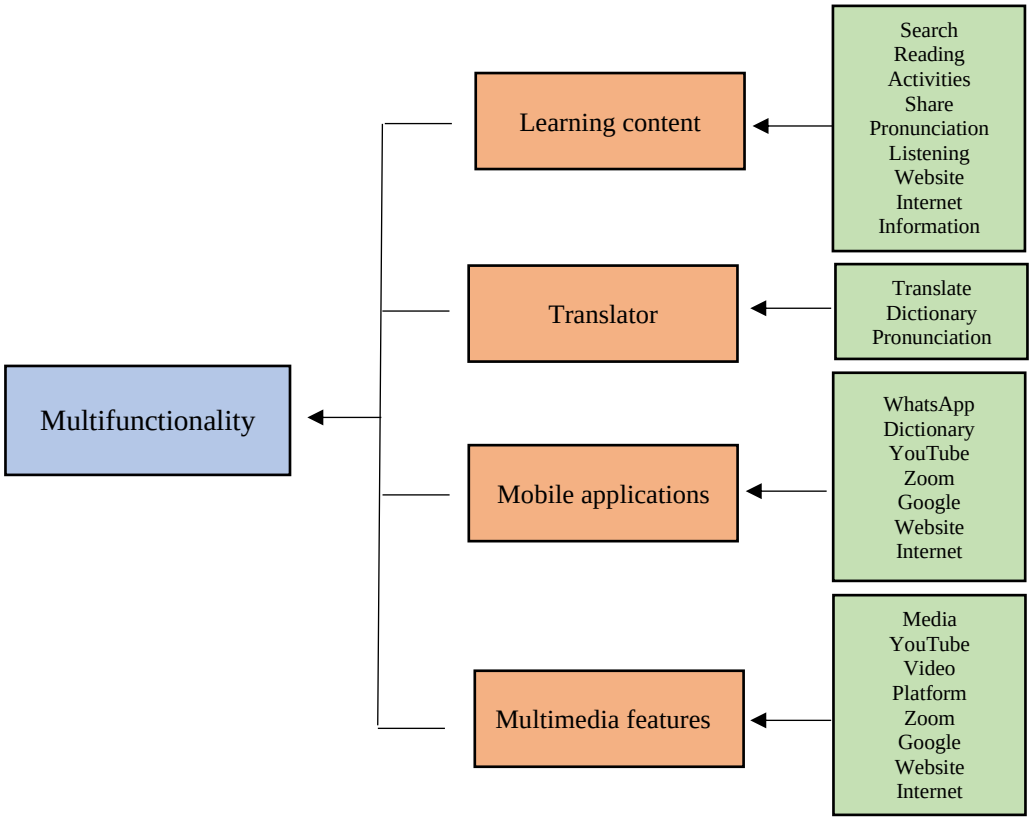

Figure 6. Theme formulation

For the second question, the subtopic of attitudes toward the application of mobile technology during teacher preparation was further categorized into attitudes toward mobile devices for self-directed EFL learning and attitudes toward mobile devices as instructional tools. For the category of attitudes toward mobile devices for self-directed EFL learning, there were two formulated themes including attitudes toward mobile devices as learning tools and self-efficacy. Finally, for the second category, three themes were generated comprising attitudes toward mobile devices as instructional tools, concerns about integrating mobile devices into the classroom, and the prospect of mobile devices for class instruction.

The third research question attempted to reveal the factors affecting beliefs and attitudes toward mobile technology. Three categories comprised the answers: perceived ease of use, perceived usefulness, and other factors which are related to the elements of self-efficacy referring to the participants' experience in using mobile devices to learn and teach EFL. Figure 7 displays the structure of the emerging themes in their respective category. For the first two categories, there was only one theme that emerged from the analysis: feasibility for the category of perceived ease of use and multifunctionality for the category of perceived usefulness. As for the categories of other factors, two themes emerged: experience with mobile devices as learning tools and teaching experience with mobile devices

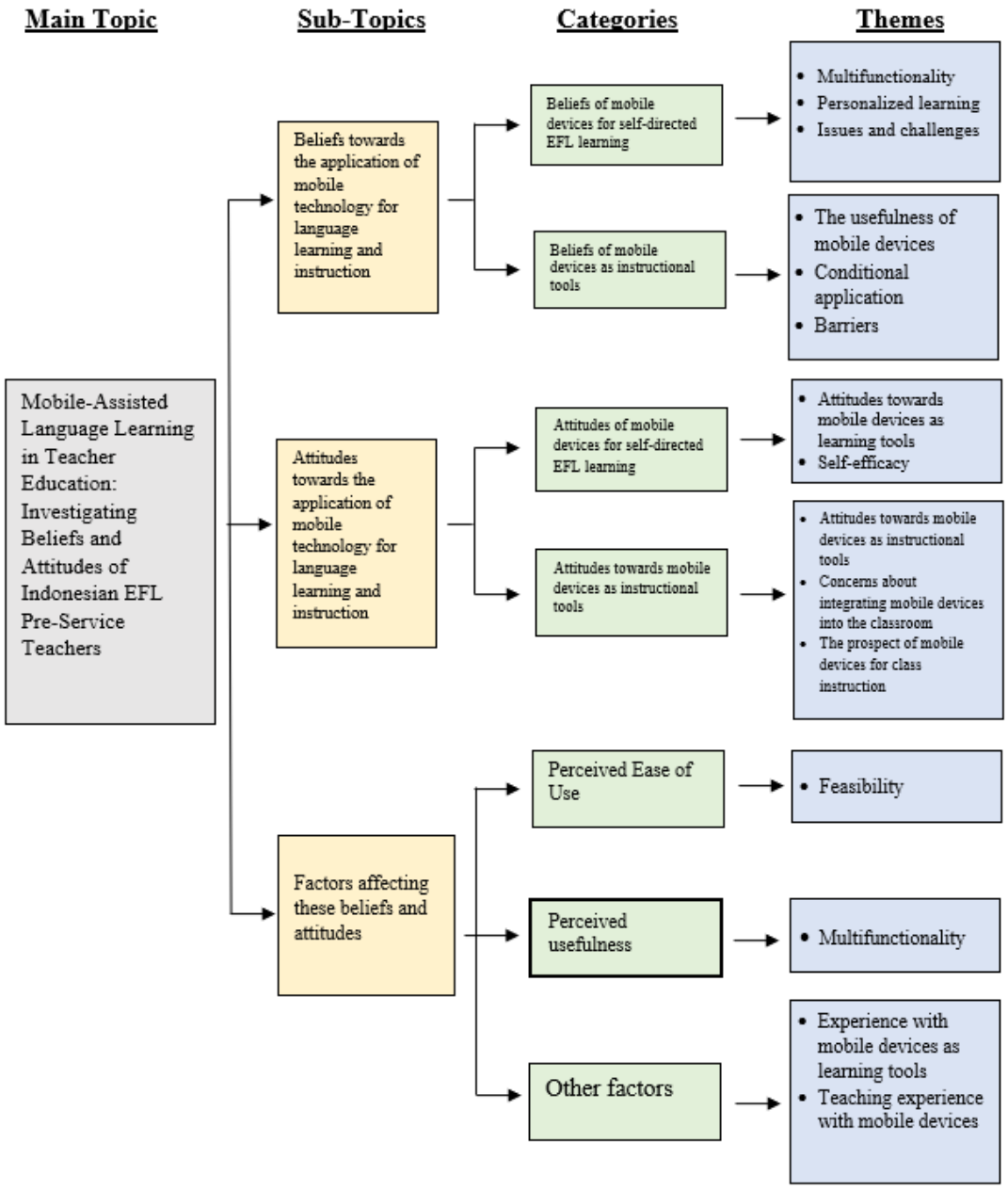

Figure 7. The formulation of topics, subtopics, categories, and themes

Findings

After the themes and codes were formulated from the findings, the next step of the analysis was to present the findings. The following sections present the elaborative results of the analysis responding to the formulated research questions.

Research Question One

What do EFL preservice teachers believe regarding the application of mobile technology for language learning and instruction during their teacher preparation program?

This question examined beliefs of EFL preservice teachers toward the application of mobile technology for language learning and instruction during their teacher preparation program. Specifically, it explored how mobile devices were used as both learning and instructional tools. For each of these functions, several themes were drawn based on the collected data.

Table 3
Coding and themes for beliefs toward the application of mobile technology for language learning and instruction

Sub-topic	Categories	Overarching theme	Sub-theme and coding instruction
Beliefs toward the application of mobile technology for language learning and instruction	Beliefs of mobile devices for self-directed EFL learning	Multifunctionality	Learning content Translator Mobile applications Multimedia features
		Personalized learning	Portability Connectivity and accessibility Instantaneous operation, multitasking
		Challenges	Poor connectivity Limited device performance Learning distraction Health issues
	Beliefs of mobile devices as instructional tools	Usefulness	Language skills development Teaching creativity Multimedia content Online learning
		Conditional application	Students' education level Supporting infrastructure Teachers' views
		Barriers	Unequal Accessibility Unequal technological competence Teaching distraction

Beliefs about mobile devices for self-directed EFL learning

The participants were requested to respond to five questions regarding their beliefs about mobile devices for their self-directed EFL learning (see appendix A). Based on their responses, the analysis findings formulated three themes including multifunctionality of mobile devices, personalized learning, as well as issues and challenges.

Multi-functionality of mobile devices

All participants agreed that mobile devices serve multiple functions to support self-directed language learning. Thus, the first theme emerging from the data analysis regarding beliefs about mobile devices for self-directed EFL learning was the multifunctionality of mobile devices. Further, the analysis led to four sub-themes that fit within this emerging theme including learning content, translator, language learning-oriented mobile applications, and multimedia features.

Learning content. All participants reported they visited websites and blogs to read or gather learning content that helped them comprehend the lecture or the materials from their classes. This occurred in some classes such as grammar classes that most participants often found overwhelming due to the numerous topics to discuss in that class. The available content from various resources was considered helpful as participants were provided multiple options to learn the content based on their preferences. In this case, they could watch multimedia content posted on social media or read content from websites or blog posts. Furthermore, they could choose to read or watch learning content that was presented in either English or Indonesian language. A participant commented that:

> I will use it (mobile device) to search for references and resources that I can use for learning English. (Participant 10)

Furthermore, the participants explained that, through mobile devices, they could access multiple academic resources instantly through mobile browsers. Through these browsers, they commented that they visited multiple databases and open access journals to read the available publications. From these resources, they could download and save learning content on their mobile devices. It was very convenient as the downloaded content could be read anytime and anywhere.

> I use my mobile devices primarily for collecting learning materials including articles from English language learning-oriented journals…. (Participant 5)

Translator. Aside from collecting learning content and references from multiple resources on the web, all participants mentioned that they primarily used their devices as the translator. With instant access to the digital stores, they could find various free and paid downloadable mobile applications including mobile dictionaries. The data identified both Merriam Webster and Oxford dictionaries as the most frequently used mobile dictionaries among participants. These applications helped them translate difficult words instantly into their native language or find the synonyms of those words. Conveniently, these dictionaries also explained how these words were used in sentences which made it easier to comprehend the meaning of the words. Lastly, these applications provided audio pronunciation features which serve as a tool to practice their pronunciation skills.

> For dictionary applications, I used Merriam Webster dictionary and Oxford dictionary. Also, I often use online translators such as Google Translate and Bing Translator. (Participant 10)

Additionally, participants frequently used mobile browsers and online translator services as an additional method for translator tools. The meanings of new words and the definitions of slang might not be available in mobile dictionaries. Thus, mobile browsers or online translator services were used as the options to comprehend those words or slang. Furthermore, some

participants also performed an advanced translation method by harnessing their mobile dictionaries along with their mobile web browsers. A participant commented:

> … Also, I used my device for translating words and sentences through Google Translate or Bing-Translator… (Participant 12)

Mobile applications. Participants' preference for mobile devices as learning tools were also driven by the availability of various ready-to-use mobile applications to support their language learning. The current mobile devices are connected to digital markets such as Play Store for android based devices and the Apple store for IOS-based devices. Both markets provide various applications which are available to download for free or paid. The participants agreed that the availability of multiple learning applications could benefit their language learning and attracted them to lean toward mobile devices over other bigger processing devices.

> I can also say that mobile devices can perform more tasks as more applications for mobile devices are available to install in the digital market than laptops in general…. (Participant 19).

In some interviews, participants shared their experiences using some mobile language applications such as Duolingo, Cake, and Elsa Speak. The most frequently mentioned application, Duolingo, is a popular mobile application that offers programs to learn more than 30 languages with easy access as well as personalized and engaging learning formats. As for Cake, this application can facilitate English learning through free videos and audio content. The mobile application Elsa Speak is equipped with a voice recognition feature to correct pronunciation errors. Participants found these applications helpful to enrich their vocabulary and improve their pronunciation skills. Furthermore, these applications provide information that helps the participants to develop their linguistic knowledge, especially grammar or sentence structures.

> I did. I installed Duolingo and Elsa Speak to practice my pronunciation skill. (Participant 2)

Another use of mobile devices as a language learning tool is to provide language exercises and general language proficiency tests. Participants reported that they downloaded mobile applications such as TOEFL Score and IELTS to practice their language skills and measure their language proficiency. TOEFL (Test of English as a Foreign Language) and IELTS (International English Language Testing System) are two particularly common assessments to measure learners' EFL proficiency in Indonesia.

> I have uninstalled several applications related to language learning. But, I still have some applications like TOEFL SCORE and IELTS band 9 to practice my skills in general English tests .... (Participant 7)

Two participants commented that they frequently used their devices to practice their linguistic skills such as grammar and vocabulary through available online exercises on the web. They argued that interactive exercises available in educational blogs or websites could provide confirmation or additional information that they needed to improve linguistic proficiency. Also using mobile devices, they could practice on their own accord due to the portability and high accessibility of their devices.

> Some have been uninstalled. However, I still use Instagram and other applications including bahasa.com. I also have several accounts on some language learning-focused websites which offer tips to improve speaking skills. (Participant 4)

All participants also mentioned that they downloaded social media applications such as YouTube, Instagram, Twitter, and Facebook to learn English directly or indirectly. They commented that social media provide learning content in multimedia formats such as videos and reading content about tips and strategies to learn English. They further added that they often found the content easier to comprehend compared to the textbooks and blog posts.

> Additionally, there are social media such as YouTube and Instagram that offers multimedia content about tips and strategies to learn English. (Participant 18)

Multimedia features. The current mobile devices are also embedded with various features such as high-quality cameras and voice recorders. With these features, participants could create multimedia content such as videos, photos, and audio. These devices could also send or receive content and play it on their screen. Regarding these functions, two participants stated that they used the video and voice recording feature to record themselves. Then, as part of their pronunciation practice, they listened to the recordings and checked their pronunciation.

> … Additionally, I can take and edit videos from my device to complete my class assignment. (Participant 2)

Personalized learning

Another theme that emerged from the analysis is personalized learning. This theme deals with the values of mobile devices and the participants' preferences for using mobile devices for learning English. Substantially, this theme unveils the participants' considerations for using mobile devices over other computing devices including laptops and PCs. It includes several subthemes such as portability, connectivity and accessibility, instantaneous operation, and multitasking.

Portability. The data showed that all participants were in favor of the portability of their devices. They argued that they carried their mobile devices specifically smartphones most of the time due to their small size and light weight. Also, these devices could operate for a relatively long period in comparison to other larger devices allowing participants to carry and use them anywhere without worrying about running out of battery.

> ... And if I compared them to laptops, they are more convenient due to their portability. (Participant 19)

Connectivity and accessibility. Compared to larger devices such as laptops and PCs, mobile devices grant better connectivity and accessibility. The participants explained that their devices allow them to access multiple resources and references which are essential for their

learning in almost any location. Unlike other processing devices, they do not need to search for WIFI support to connect to the internet. Mobile devices such as smartphones can serve as standalone devices that continually connect to the internet service.

> I think mobile devices specifically mobile phones are more portable and efficient compared to laptops. Thus, I can use my device to submit my work and check the notifications about my class assignments. Moreover, I can access instructional platforms of either ZOOM or Google Classroom from my mobile device. (Participant 6)

Instantaneous operation. The participants also agreed that the value of their mobile devices lies in their instant operation. Unlike other learning devices such as laptops and PCs, participants could instantly activate their devices without the booting process. Additionally, participants could open multiple applications such as a mobile dictionary and a mobile browser and operate them simultaneously.

> … I always use my phone everywhere I go and I feel like I can access any information I need easily and instantly. (Participant 12)

Multitasking. Also, another reason for their favor of mobile devices is the possibility to perform multitasking. Two participants commented that they could operate their devices with one hand for learning languages while they were doing other activities with another hand. For instance, they could watch a video about learning strategies while they were having lunch.

> … Second, some of us are often reluctant to work in groups. Thus, mobile devices allow us to study independently through our devices… We can practice our language skills while doing another activity or relaxing. (Participant 9)

Challenges

Despite the affordance of mobile devices, the participants also mentioned several challenges and issues in operating their devices for language learning. According to the findings, the challenges and issues that the participants encountered as they used their mobile devices as learning instruments included poor connectivity, limited device performance, learning distraction, and health issues.

Poor connectivity. Nine participants complained about a frequent drop in the internet speed connection which added time of delay for accessing resources through the web and streaming video content. These participants happened to live in areas with poor internet connections. Additionally, one participant specifically complained about the cost of the internet service as good internet service usually came at a high cost.

> I am concerned with the cost of the connectivity. For me, it costs quite a lot to get a good connection. Also, I found that the connectivity around the areas of my residence is relatively poor. (Participant 9)

Limited device performance. Participants complained that mobile devices were quickly outdated and their performances constantly decreased. Some applications required updates which took up large storage space and slowed down the device's performance. Moreover, new applications including language learning applications were available in relatively large sizes, which might not be suitable for their devices due to their small storage space. As a consequence, they had to uninstall some applications to replace them with new ones. Lastly, they complained about the repeated notice of low device memory.

> Also, regarding the specification, I feel that the memory capacity of my device is relatively small compared to the latest generation of mobile devices. (Participant 12)

Another technical issue concerned the small screen of mobile devices. As opposed to the value of mobile devices which lies in their portability, mobile devices might not be suitable to perform particular tasks including playing or editing multimedia content, multitasking, and typing. Therefore, they preferred to use their laptops or PCs instead of mobile devices for particular tasks despite having equal processing ability.

> I feel that there are several limitations we can find in my mobile devices for learning. For instance, due to low screen resolution and the screen size, the downloaded videos cannot be played at their best quality. (Participant 14)

Learning distraction. Two participants agreed that their mobile devices could not serve as the primary tool for learning. Aside from their primary function for communication, mobile devices, especially smartphones, could be used for various entertainment functions such as playing music, accessing social media, and playing mobile games. Thus, they mentioned that they were unable to focus on learning and were likely tempted to use their devices only for entertainment purposes. Additionally, they frequently received notifications from social media as the majority of them claimed to be active social media users.

> I find that mobile devices can be distractive for the learning process. For instance, we might be distracted by message notifications as we use our devices for learning. (Participant 20)

Health issues. Lastly, eight participants addressed health issues as another challenge in employing mobile devices as learning tools. Viewing device screens for a long period could strain ones' eyesight. Also, the small screens of mobile devices make the risk even more prominent due to a shorter viewing distance compared to laptops and PCs. Interestingly, the participants stated that they were aware of the risks, but these risks did not stop them from frequent use of the devices. Regarding this matter, one participant explained:

> From my experience, prolonged use of mobile devices might harm our health, especially our eyesight. Thus, the use of mobile devices should be well managed. (Participant 12).

The study also reported participants' concerns regarding social issues such as the risk of addiction to mobile devices. Three participants felt that they were heavily drawn to their devices and spent most of their time using them. Specifically, they used social media or enjoyed multimedia content solely for entertainment purposes. They even admitted being slightly addicted to their mobile devices which elevate their ignorance of time and surroundings:

> … I am also worried that my health might be negatively affected by the prolonged use of mobile devices. I found a report that prolonged use of mobile devices might cause addiction, a lack of physical movement, insomnia, and an inability to concentrate. (Participant 14)

Beliefs in mobile devices as instructional tools

Aside from using mobile devices for learning tools that help participants develop their language skills, they were also involved in student teaching which allows them to use these devices for instructional tools. Moreover, during their teacher training program, they learned how to utilize various applications of educational technology for teaching EFL. Regarding this issue, the interview attempted to reveal participants' beliefs about using mobile devices as instructional tools. From the analysis, three themes were identified comprising the usefulness of mobile devices for class instruction, conditional application, and barriers and challenges

Usefulness

The first theme to emerge in the analysis of participants' beliefs about mobile devices as instructional tools is the usefulness of mobile devices. The theme suggests that all participants acknowledged the positive effects of mobile devices on class instruction specifically for instructors. Furthermore, all participants believed that the use of mobile devices promotes students' language skills development and teaching creativity. From the analysis, the data also that mobile devices offer multiple options for multimedia content and online learning.

Language skills development. The participants agreed that incorporating mobile devices for classroom instruction could improve students' language performance. For instance, YouTube and online learning videos presented engaging and comprehensive learning content. From images in the videos, abstract vocabulary and concepts can be well described and explained. The embedded music player in the mobile device could play English songs which helps students to practice their listening skills. Participants also shared their idea to use mobile devices to practice students' speaking skills by utilizing the voice recording feature. As for reading, they found

varied reading content from the internet and presented it in the classroom. In this regard, one participant asserted:

> I think mobile devices might work best for listening activities. Students can be guided to listen to English songs that expose them to new vocabulary in an enjoyable way. Next, I think the use of mobile devices also works for reading activities. Teachers might want to get students to read various content as frequently as possible from multiple resources including online newspapers. Building reading habits among students will lead to the development of their reading skills. (Participant 18)

Teaching Creativity. The participants also highlighted the impacts of mobile devices on teachers' creativity. Several participants mentioned that teachers might incorporate mobile technology to develop new and distinctive activities in class. For instance, the participants pointed out the function of mobile devices to develop learning activities through Padlet which facilitates learning collaboration under a scheme of group work. Through this group work, students could improve their language performance and develop their soft skills such as leadership, teamwork, and communication.

> … I have. Also, in my previous classes such as CALL (Computer-Assisted Language Learning) class, the instructor explained how to use Padlet, a teaching platform that can be harnessed to increase students' participation in class. Next, we were involved in a group discussion. (Participant 1)

A participant shared her story about using Kahoot in their classes. Kahoot is a prominent tool for teachers to gamify classroom activities. Through this template, teachers can create short learning quizzes that can be arranged in multiple formats and include multimedia content such as images, sounds, or videos. To participate in the quizzes, students were required to visit a link directing them to Kahoot and input the code shared by the teacher. This quiz also presents a scoring table that drives students to be competitive to achieve the best score. Overall, the participants agreed that mobile applications such as Kahoot can potentially bring new learning experiences that can positively affect students' language learning progress.

> When I was teaching in my class, some students asked me to let them use their mobile devices in the classroom. I never thought about using mobile devices to teach before. Next, I thought about how I could incorporate mobile devices in class. I chose Kahoot! to evaluate students' comprehension of the content in a game format. Students seemed to enjoy the activity as they were motivated to answer the questions and worked their best to get the best score in the game. (Participant 19)

They also mentioned using mobile devices to find references for developing classroom instruction. Designing teaching activities to present meaningful learning experiences for students can be a challenging task for teachers. Thus, through their mobile devices, they can find tips and strategies to incorporate technology including mobile devices to develop engaging and effective classroom activities.

> As I previously mentioned, for my role as a teacher, I will use my device to search for learning content and, at the same time, learn new things about teaching strategies and methods. (Participant 19)

Multimedia content. Additionally, all participants highlighted the function of mobile devices to create, transfer, and play multimedia content such as videos, images, and audio. For instructional purposes, teachers can present educational multimedia content they collected from multiple resources in their classes through mobile devices. The participants implied that using this type of content might increase learning effectiveness and improve students' learning motivation. In addition, participants can use their devices to record themselves teaching the lesson through mobile devices and share it with their students.

> Maybe, I use my device to conduct my future classes through Schoology or Google Classroom. Next, I will also use my device to develop learning materials in a video format and upload them. I will later instruct my students to watch these videos through their mobile devices. (Participant 2)

Online learning. Participants argued that mobile devices can be harnessed to facilitate online learning. Due to the global pandemic, the role of mobile devices has become more prominent as they facilitate remote interaction between the instructor and students or among students as well as other classroom activities (Moorhouse & Beaumont, 2020). Moreover, the

available teaching platforms such as Google Classrooms, ZOOM, or Moodle grant students and the teacher to interact in engaging ways on their mobile devices.

> In my class which was held in an online format, I used several platforms such as Google Classroom, WhatsApp, and YouTube. WhatsApp was used to inform students about any updates in their classes. Google Classroom was used to manage the class, and during the class, I continuously monitor my class and guide students to complete the tasks. Also, through mobile devices, I created instructional videos which were later updated to YouTube. (Participant 15)

Conditional Application

Interesting information gathered from the interviews regarding the use of mobile devices as instructional tools lie in particular conditions under which mobile devices can be properly integrated for EFL teaching. From the findings, the participants highlighted their preferences to use mobile devices as supporting devices that should be used carefully in particular learning sequences. For instance, five participants argued that mobile devices should be used only to translate difficult words or open the learning content which is shared by their teachers. A participant commented that:

> mobile devices should only be used for non-primary learning activities including watching teaching videos. (Participant 11)

Students' education level. The participants also pointed at the level of students to determine whether or not mobile devices can be properly harnessed in class. Two participants believed that students in middle schools or lower might independently find difficulties following instructions from teachers to utilize their devices for class instructions. During their student-teacher program, participants who taught in middle schools mentioned that the majority of students were reluctant to follow teachers' instructions and tend to be passive during online interaction through mobile devices.

> I think it is good as long as the teacher can still monitor and manage the students' actions. However, we need to consider the level of the students. I think students of elementary schools might not be capable of performing tasks through mobile devices. At least, ninth-

> graders might be capable of performing the required tasks through mobile devices. Also, students need to own mobile devices and harness the functions properly. (Participant 11)

Supporting infrastructure. Another condition to consider for effective applications of mobile devices is the availability of supporting infrastructure which primarily refers to connectivity and device specifications. To incorporate mobile devices for class instruction, teachers and students must connect their devices to the internet to access learning content or instructional platforms. Thus, a good internet connection is a primary requirement for learning through mobile devices. In addition, devices specifications should also be considered as it is likely that some devices might not perform well due to their below-standard specifications.

> … I think mobile devices that are used in the classroom must have good specifications and the internet connection with good speed should be made available. Also, the supporting facilities should be provided by schools. (Participant 17)

Teachers' views. The adoption of mobile devices for class instruction requires suitable mindsets of teachers. As learning facilitators, teachers need to understand that mobile devices serve as tools to improve learning activities and help students understand the learning content better. However, mobile devices should not be employed solely to provide additional exercises to students and thus increase burdens to students. The participants emphasized that teachers creatively utilize mobile devices to facilitate engaging and communicative learning activities. Therefore, school supports through technological training or workshop is deemed necessary.

> One thing to consider when integrating mobile technology in the classroom, teachers do not put additional burdens by excessively giving students assignments in every meeting. (Participant 16)

Barriers

The adoption of mobile technology is not without any barriers that prevent teachers from effectively adopting this technology in their classes. This study indicates various barriers to the

integration of mobile technology for classroom instruction including unequal access, unequal competence, and teaching distraction.

Unequal accessibility. Students did not have equal access to mobile devices. Some students needed to use their parents' devices to learn and access the online class. As a result, they might not have been able to fully utilize mobile devices for self-directed learning. For any instruction format, the unavailability of mobile devices serves as the primary barrier to integrating mobile technology into the classroom.

> ... However, we also need to consider the unequal accessibility to mobile devices among students as they still become an issue in some certain areas. (Participant 16)

Unequal technological competence. Ten participants stated that the main issue with adopting mobile technology in the classroom is the inequality of students' digital skills. As teachers intend to use mobile devices in class, students likely need to use their devices as well. However, each student has technology aptitude which ranges from low to high. For teachers, it can be an issue as students would gain more burden as some of them might encounter technical difficulties to use their devices properly in class.

> … As for middle schoolers or those in the lower levels, many students still share mobile devices with their parents…. Furthermore, in terms of technological competence, I found most students at the high school level are equally competent to utilize mobile devices in the classroom. However, for middle schoolers or lower, I could see that some students might have difficulties operating their devices for class activities…. (Participant 16)

From the data, participants also stated that many teachers especially the elderly are prone to technological anxiety. They tend to avoid using technology as they have low self-efficacy regarding their technological skills. During the global pandemic, schools were instructed to facilitate instruction with necessary support including WIFI or laptops for teachers. However, teachers were anxious and opted to use their mobile communication applications such as WhatsApp through mobile devices. They found this application very familiar and easy to

operate. As for administration, they often requested assistance from assigned teachers to upload reports and documents.

> First, I think teachers might not be equally competent to use mobile devices for instructional purposes.... (Participant 14)

Teaching distraction. The participants also highlighted the issues in monitoring students' actions entirely during the class. Five participants explicitly expressed their concern regarding students' tendency to access different websites or visit social media while being assigned to complete a task through their devices. They assumed that the use of mobile devices might be less effective should teachers fail to direct students to focus on their class and alleviate any possible distraction by limiting access to some websites or social media.

> In my opinion, I found that using a mobile device in class exposes students to distractions so I prefer to use my laptop. Moreover, a laptop is used for more serious tasks than a mobile device. Also, using mobile devices in class, we might be unable to monitor students' actions thoroughly. As we know, many applications pose the threat of learning distractions such as Instagram. I was once reprimanded for using my mobile device in class instead of using a laptop as requested. I thought at that time that I could use my mobile device to complete the assigned task. The instructor argued that using a mobile device in class is unethical. (Participant 1)

Research Question Two

What attitudes do EFL preservice teachers demonstrate toward the application of mobile technology for language learning and instruction?

The next question shifted the attention to attitudes EFL preservice teachers demonstrate toward the application of mobile technology. Similar to the previous question, Participants were required to explain their attitudes after using mobile devices as both learning tools and instructional tools.

Table 4
Coding and themes for attitudes toward the application of mobile technology for language learning and instruction during their teacher preparation program

Topic	Categories	Overarching theme	Sub-theme and coding instruction
Attitudes toward the application of mobile technology for language learning and instruction during their teacher preparation program	Attitudes toward mobile devices for self-directed EFL learning	Attitudes toward mobile devices as learning tools	• Increased frequency of use • Productivity tasks
		Self-efficacy	• Usefulness • Ease of use
	Attitudes toward mobile devices as instructional tools	Attitudes toward mobile devices as instructional tools	• Lack of interest • Disappointment • Acceptance of mobile technology
		Concerns about integrating mobile devices into the classroom	• Knowledge • Risk
		The prospect of mobile devices for class instruction	• Improved functions • Modernization

Attitudes toward mobile devices for self-directed EFL learning

The data of the interview revealed that mobile devices were deemed helpful as language learning instruments. In particular, the data indicates positive attitudes and the acceptance of mobile devices among participants.

Attitudes toward mobile devices as learning tools

Regarding the reason for their attitudes, the participants reflected on their previous response stating that they were fond of the practicality, portability, and accessibility offered by the devices. Specifically, a participant addressed the issue regarding the availability of printed textbooks and other learning resources. Thus, she found mobile devices helpful for providing the latest knowledge and information from the available content on the internet.

> I will use my devices more frequently. I just think that it is now very difficult to find published textbooks so it is more convenient to access new information through our mobile devices. (Participant 16)

Increased frequency of use. They further agreed that they will continuously use their devices and possibly increase the frequency of use in the future. In the previous section, it was found that participants utilized their devices for multiple learning purposes. With a significantly increasing number and the continuous development of current mobile applications, they further believed that the functions of mobile devices would develop with easier and simple operation as well as richer and more engaging features.

> As I previously explained, I am very certain that technology keeps developing and the dependency on technology will increase. Thus, the use of mobile devices might diminish the current learning practice such as using paper-printed textbooks. (Participant 1)

Productivity tasks. It is also important to notice that, despite the acceptance of mobile devices from all participants, two participants argued that they prefer bigger devices to perform particular tasks for learning purposes. The screen size has been the primary reason for this argument. Three participants added that mobile devices do not suit productivity tasks including opening and editing documents.

> Since my device has a relatively small screen, I find it difficult to read files. I also don't feel comfortable typing on it. (Participant 13)

Self-efficacy

Another code that emerged from the participants' beliefs about mobile technology for language learning is self-efficacy. In this study, self-efficacy concerns participants' confidence in their own capabilities to operate mobile devices for self-directed learning tools. Also, this study indicated usefulness and ease of use affected the levels of participants' self-efficacy.

Usefulness. The interview revealed that the participants had the confidence to use mobile devices as a learning and instructional tool which shapes their beliefs and attitudes toward this technology. It was pointed out that their beliefs that using mobile devices for learning helped them achieve an adequate proficiency with technology.

> Using my mobile device to learn English is easy. … Also, it makes learning easier and allows me to do another activity at the same time. (Participant 10)

Ease of use. Furthermore, the findings indicated that the majority of the participants did not encounter meaningful difficulties operating language learning-related mobile applications. They expressed their familiarity with those mobile applications and harnessed them for a relatively long period. Also, most applications present similar user interfaces which help participants recognize the functions with no significant difficulties.

> I think it is easy. From my experience, mobile devices can be used as a replacement for a dictionary through available dictionary applications. I can also say that I am quite familiar with the use of mobile devices. (Participant 16)

Attitudes toward mobile devices as instructional tools

As instructional tools, participants believed that mobile device-assisted instructional activities can be well developed to positively affect students' learning experience. The previous findings indicate that mobile devices are well suited for complementing the primary class activities allowing teachers to present attractive learning content or develop class activities through its integrated media features such as voice and video recorder. However, these beliefs did not necessarily lead to positive attitudes toward mobile devices as instructional tools.

Lack of interest. 12 participants highlighted their lack of interest in using mobile devices in their class despite their beliefs about the affordance of mobile devices. They asserted that there are various considerations before deciding to use this technology including the level of education, the availability of supporting infrastructure, and the conditions of students. For them, in-person classrooms with more common technology applications such as PowerPoint presentations give them more assurance for effective learning activities rather than mobile-device-assisted activities.

> …. I lean toward more conventional teaching methods … I am not really into mobile devices through I believe that mobile devices can positively affect language learning. I think I can still use other kinds of technology to support me. (Participant 17)

However, they do not seem to be resistant to the use of mobile devices in case the ideal conditions are met and the need of integrating technology for instance, online and blended learning, exists. Thus, a participant mentioned:

> Interviewer: How do you think you are going to use your mobile devices to teach English in the future?
> Interviewee: I will use my mobile device to find learning content and conduct online classes. (Participant 9)

Disappointment. Two participants were disappointed by the improper use of mobile devices among students and rejected this technology for in-person classroom instruction. They emphasized the difficulties and challenges to manage and monitor students when using mobile technology. Additionally, during the remote learning, participants complained that students were very passive. They argued that students should be approached in person to actively involve them in the learning process. Hence, they agreed that mobile devices posed significant threats to learning focus and students' participation.

> I once had an experience in which students requested to use their devices in class. Yet, students improperly used their devices to open another application. Thus, I need to remind them of the time to complete their assignment. (Participant 13)

Acceptance of mobile technology. Despite the negative attitudes expressed by the majority, eight participants believed that technology constantly develops and future classroom instructions will be technology-based. They approved the use of mobile technology in the classroom and expressed their readiness toward the use of technology including mobile devices in their future classrooms. Also, the use of mobile devices during the student-teaching program shaped how they perceive the integration of mobile devices in class.

> I think it (mobile technology) will be more popular in the future. Along with the development of technology, mobile devices will be more sophisticated and offer flexibility and multiple functions to support the learning process. (Participant 12)

Concerns about integrating mobile devices into the classroom

The majority of the participants implied their negative attitudes regarding the use of pedagogical technology by teachers for instructional purposes. Despite their awareness of the benefits of this technology, there was hesitation among the participants that they could optimally employ mobile technology to elevate the quality of teaching with their current skills.

Knowledge. Regarding the applications of mobile devices for classroom instruction, the majority of them claimed that they had no class discussion specific to the use of mobile devices. For some participants, their courses provide the primary sources of information regarding the application of pedagogical technology. It implies that some participants lack the knowledge and skills to creatively develop their class through the use of mobile devices which results in their lack of interest in adopting mobile devices in their class. A participant commented:

> However, I still think that it might not be a good idea to allow students to use their devices during the lesson. (Participant 13)

Risk. Moreover, participants also showed their concern regarding the use of mobile devices in class. They were aware of the risks of adopting mobile devices for instructional practices and suggested a careful use of this technology according to the topic of the class materials and the plan of classroom activities. Additionally, they supported the argument that teachers should be aware of the risks of this technology and use it only when it deems necessary. Without proper strategies, students would become distracted and lose their attention during the learning process. In other words, students were likely to use their devices for non-learning activities which deviated from the main purpose of their learning.

> For in-person teaching, I think using mobile devices might be quite challenging for both teachers and students. There is a risk that teaching might be ineffective as well. Thus, I

> think it might be best to use mobile devices for supplementary learning activities such as opening PDF files or translating words and sentences. (Participant 20)

The prospect of mobile devices for class instruction

During the interview, a question was asked to participants regarding the popularity of mobile devices for future language instruction. Despite mixed responses regarding their beliefs about mobile devices as instructional tools, all participants agreed that the use of mobile devices would increase along with the development of mobile technology. They argued that both teachers and students were aware of the growing number of mobile device users along with the improved features and new mobile software. All in all, mobile technology is gaining more popularity and has made way for more extensive uses in instructional practices.

> Mobile devices may be very popular in the future. I am aware of the benefits of mobile devices such as sharing learning content in the format of videos. Besides, the use of mobile devices is common among teachers and students. (Participant 13)

Improved functions. The adoption of mobile technology is inevitable in the future. The participants accepted the idea that mobile technology had the potential to facilitate learning even under an unprecedented situation like the pandemic era. During their student-teaching program which was mediated through online platforms, they found that mobile technology supported basic functions for classroom instruction such as monitoring students' learning activities, administering tests/assignments, and facilitating classroom interaction. All participants agreed that, in the future, the integration of mobile learning would develop along with the functions of mobile devices.

> I think mobile devices will be very popular and more frequently used for various purposes. Due to the global pandemic, students became used to online classes and the use of mobile devices in general. Thus, in the post-pandemic era, I believe that teachers will keep using mobile devices, especially for online classes. (Participant 16)

Modernization. Two participants emphasized the need for modernization in the current education system. They firmly believed technology has taken a significant role in our daily

routine which makes people become more reliant on it. It also applies to the education system as innovation through technology could bring a new learning atmosphere, which offers a more meaningful learning experience.

> I think the use of mobile devices for teaching will be more popular in the future. From my experience, the use of mobile devices especially mobile phones were strictly limited in schools. However, now, even elementary students are used to using mobile devices as learning media. Thus, I assume that the use of mobile devices for class instruction will inevitably increase. (Participant 19)

Research Question Three

"What factors affect these beliefs and attitudes?"

The last research question attempted to reveal the factors influencing beliefs and attitudes of EFL preservice teachers in Indonesia. Comprehending these factors is essential as they serve as either an encouragement or a barrier to the integration of mobile technology for language learning and instruction. Based on the Technology Acceptance Model (TAM) and self-efficacy theory, individuals' actions to use particular technology are determined by various elements including their perceptions and experience with the technology. Therefore, the categories for the analysis of the interview data were formulated as (1) perceived ease of use, (2) perceived usefulness, and (3) other factors. The categories, overarching themes, and sub-themes as well as coding instruction from the analysis are described in table 5.

Table 5
Coding and themes for factors affecting these beliefs and attitudes

Topic	Categories	Overarching Theme	Sub-theme and coding instruction
Factors affecting these beliefs and attitudes	Perceived ease of use	Feasibility	• Portability, connectivity, and familiarity
	Perceived usefulness	Multifunctionality	• Translator • References and resources • Broad connectivity • Improved language skills • Teaching creativity
	Other factors	Experience with mobile devices as learning tools	• Vicarious experience • Enactive mastery
		Teaching experience with mobile devices	• Enactive mastery • Physiological arousal

Perceived Ease of Use

Perceived ease of use is the extent to which an individual is certain that technology can be operated with minimum effort (Lederer et al., 2000). In this study, this category deals with the practicality and simplicity of the use of mobile devices. Also, for this category, only one theme was formulated based on the emerging code.

Feasibility

Portability, connectivity, and familiarity. A mobile device refers to various types of devices that are capable of processing computational tasks. These devices offer portability and ease of operation. Referring to the definition, both smartphones and tablets fit the criteria of mobile devices. From the findings, the majority of the participants used mobile phones as both learning and instructional tools. Only three participants owned tablets and mobile phones. However, they primarily used their mobile phones for learning and teaching EFL.

The participants agreed that mobile phones are feasible to operate due to their portability and connectivity. The device portability serves as the primary value of mobile devices compared

to other types of processing computer devices. The participants can easily bring their devices anywhere and use them to serve their function as communication tools, web browsers, media players, or even game consoles. Rather than tablets, all of the participants used smartphones as the type of mobile device for both learning and teaching tools. For 18 participants the primary reason is their sole possession of the devices. Meanwhile, only two participants pointed out their preference for smartphones over tablets or other devices such as laptops or PCs for performing particular tasks.

> I think mobile devices offer flexibility compared to other devices such as laptops. Specifically, mobile devices are so portable that we can take them anywhere we want and activate them anytime. Overall, mobile devices are easier to operate than laptops. (Participant 3)

In terms of connectivity, mobile devices especially smartphones are usually connected to the cellular network. Hence, the devices can always be connected to the internet for ease of access to various references and resources. This connectivity also grants the participants easy access to various references in order to gain the necessary information about language learning through their devices as easily as through bigger devices such as laptops or PCs. For this purpose, they used mobile browsers or social media including YouTube or Instagram.

> I think it is easy to use my mobile device. Compared to my laptop, I find it more convenient to use my mobile device, I do not need to boot up to activate. In other words, the use of mobile devices is more instant. Next, I can easily connect my mobile device to the internet anywhere and anytime. (Participant 14)

Participants also highlighted perceived ease of use due to their familiarity with their mobile devices, especially mobile phones. The majority have used their devices for at least four years. The ownership of mobile devices for a long period and the experience with the technology provided opportunities to explore the use of their devices for various purposes.

Perceived usefulness

Davis (1993) defined perceived usefulness as the degree to which the technology information positively empowers an individual to perform particular tasks. In this study, this category concerns the benefits offered by mobile devices as tools for learning and teaching EFL. The findings indicated that an agreement among participants agreed that mobile devices were useful to achieve their learning and instructional goals.

Multifunctionality

The participants mentioned that mobile devices served multiple functions for learning and instruction. The findings revealed the most frequently mentioned codes regarding the functions of mobile devices including translators, references and resources, broad connectivity, improved language skills, and teaching creativity.

Translator. One primary use of mobile devices among the participants was mobile translators or dictionaries. For instance, some participants commented that they often used mobile dictionary applications to find the meanings of difficult words. These applications were also used to check their pronunciation.

> In some classes, I used some applications on my mobile devices specifically dictionary applications which help me to translate and check my pronunciation. (Participant 19)

References and resources. The ease of accessibility allows participants to use their devices to browse information, download various references, and transfer or receive data from other devices. Additionally, some participants added that they accessed social media instantly through their smartphones or tablets and followed or subscribed to pages that provided important information about tips and strategies for language learning. For instance, participant 4 responded:

> … However, I still use Instagram and other applications including bahasa.com. I also have several accounts on some language learning-focused websites which offer tips to improve speaking skills… I have an account that I use to access social media TIK-TOK. This social media shared videos that explain tips and strategies to learn English. I also

> listened to several Podcats and used Duolingo to practice my language skills. (Participant 4)

Broad connectivity. Moreover, the participants mentioned that students can get connected instantly to their teachers, peers, or individuals who can provide support for their learning. In a classroom context in which teachers adopted groupwork under a scheme of online learning or blended learning, the perpetual connectivity can be harnessed by teachers to provide guidance or by students to seek assistance in learning. One participant mentioned that, through mobile devices, she could get connected to native speakers of English and practice communicating with them.

> … Also, it can be harnessed as a medium of communication allowing me to interact with my classmates. (Participant 3)

Improved language skills. As instructional tools, the participants reported that mobile devices can be potentially harnessed to improve language performance. They further asserted that students were motivated to use their own devices during the class and their language performances were enhanced through mobile devices supported activities. Also, the participants commented that mobile devices can improve productivity. They can create multimedia content such as videos, images, and audio. They can also make some edits and exchange the content with other devices more easily and efficiently compared to other processing devices.

Teaching creativity. Additionally, classroom activities can be creatively improved through the use of gamification. Participants agreed that teachers can use available games accessible through mobile devices to facilitate a more engaging language learning process for students. One of the participants explained:

> When I was teaching in my class, some students asked me to let them use their mobile devices in the classroom. I never thought about using mobile devices to teach before. Next, I thought about how I could incorporate mobile devices in class. I chose Kahoot! to evaluate students' comprehension of the content in a game format. Students seemed to

> enjoy the activity as they seemed to be motivated to answer the questions and worked their best to get the best score in the game. (Participant 19)

Other factors

The third category concerns other factors regarding self-efficacy. These factors are correlated to the stories and experiences shared by the participants during their teaching training program which includes their experience in class as learners and during the student teaching program as instructors.

Experience with mobile devices as learning tools

The participants' experience with mobile devices also shapes their beliefs and attitudes toward mobile devices in classroom instruction. All of the participants indicated a long-term experience (more than 4 years) with mobile devices. Some of them stated that they have used mobile devices since high school. However, all participants mentioned that they have never been asked to use their devices in class until their college classes. This long encounter with mobile devices indicates the influencing elements that shaped their self-efficacy toward mobile technology. Referring to self-efficacy theory, participants' experience with mobile devices as learning tools indicated two elements in this theory: vicarious experience and enactive mastery.

Vicarious experience. In their university classes, the role of mobile devices is quite prominent. As communication devices, mobile devices facilitate communication between instructors and participants as students. Specifically, they explained that the instructor formed WhatsApp groups to ease the class interaction and discussion which expanded beyond the class hours. The instructors shared links to particular references for additional learning content. They also provided some instructions for their students for some assignments or communicate after class allowing participants to ask or confirm information regarding the learning content. From this class experience, participants observed how mobile technology was utilized in the class

which shaped an image of the practical application of this technology for their future class. A participant further asserted:

> The instructor in one of my classes assigned students to create a WhatsApp group. Through this group, the instructor facilitated classroom discussion even after the class hour. (Participant 4)

Since the emergence of the global pandemic, the use of mobile devices has been more intensive (Moorhouse & Beaumont, 2020). The participants asserted that all of their in-person courses were shifted to the online format. Thus, mobile devices became tools to access their classes. Aside from WhatsApp, some instructional platforms such as OnClass and Schoology were used by the instructors to manage class activities.

> Most classes used OnClass as the primary teaching platform that most students and instructors find easier to access through laptops. (Participant 14)

Enactive mastery. A participant shared her story using the OnClass platform. She explained how the platform was utilized for various class activities. It allowed instructors to share materials, instruct students to practice their language skills through assignments, and evaluate students' progress. Participants mentioned that this system was accessible through mobile devices and most of the time they accessed it through their mobile devices. Briefly, she reported:

> In my Translation class, the instructor used the online class format. We were required to sign up in the first 15 minutes of the class. Then, he explained the topic and also shared the learning content. Students can read the content by themselves. As for the daily assignments, the instructor uploaded them on the online platform after the meeting and we were to complete them in three days. I usually used my mobile device to access the platform and check the assignments. (Participant 14)

Teaching experience with mobile devices

Another element that can potentially serve as an influential factor in participants' beliefs and attitudes is their teaching experience during their student-teaching program. Participants employed their mobile devices to teach their classes in the online format due to the global

pandemic in 2020. Despite the fact that the majority of the participants had neither prior experience teaching online classes nor prior knowledge to optimally utilize their mobile devices for class instruction, the participants managed to complete their teaching tasks as part of their student-teaching program. According to self-efficacy theory, the was an indication that both enactive mastery and physiological arousal affected the participants' self-efficacy toward mobile technology as instructional tools.

> In my class which was held in an online format, I used several platforms such as Google Classroom, WhatsApp, and YouTube. WhatsApp was used to inform students about any updates in their classes. Google Classroom was used to manage the class, and during the class, I continuously monitor my class and guide students to complete the tasks. Also, through mobile devices, I created instructional videos which were later updated to YouTube. (Participant 15)

Enactive Mastery. The participants reported that they employed several teaching platforms such as Google Meet or ZOOM to ease the connection between teachers and students. Considering the emergence of the 2020 global pandemic, in-person meeting was prohibited. Thus, the online meeting was deemed the most reasonable option to continue the teaching and learning process. Some participants added that, on some occasions, they accessed their class through mobile devices and provided instruction through the feature of a video conference. Also, using mobile devices was deemed as easy as using larger devices such as laptops. This ease of use of mobile devices was echoed by a participant who preferred to use mobile devices over her other computational devices to access the teaching platform:

> I used my mobile device in this program which was held as the pandemic started to emerge. The use of the mobile device included access to the ZOOM platform which was done once a week. Also, I employed WhatsApp groups to share learning content with students and mediate classroom discussions. I felt very accustomed to operating my mobile device for my teaching practice and fortunately, I also received the necessary support from my cooperating teacher. (Participant 20)

Also, during their student teaching, some participants even mentioned that they fully conduct their instructional practice through their smartphones utilizing WhatsApp group chat.

Previously, students and parents complained about the use of the regular instructional platforms of Google Meet due to the accessibility and connectivity. Specifically, there was an issue of the slow internet connection which gave students difficulties to complete their class assignments. In some areas especially sub-urban or rural areas, the internet coverage is not as fast as in urban areas. Therefore, the schools decided that teachers utilized the most convenient platform for both teachers and students.

> During this program, I used WhatsApp through my mobile device to support my classroom activities including checking students' attendance, sharing learning multimedia content, and giving assignments. Previously, the school adopted the Google platforms to conduct online teaching. However, the students' parents complained about the poor connectivity due to the poor internet connection in the area. Thus, WhatsApp was primarily used as the instructional platform. (Participant 16)

Physiological Arousal. Reflecting on her experience during the student teaching, a participant reported that students were not used to using mobile devices as a medium of class interaction. She added that students were relatively passive during the instructional process and only responded as teachers individually pointed at them to answer questions. Also, mobile device-assisted learning tends to be teacher-centered. Teachers hold total control of the class and students could not be directed to independently discuss the topic of the instruction in groups as easily as in an in-person class. Teachers could not provide oral feedback which is often essential for motivating input for students to get more engaged in classroom discussion.

> During this program, the class instruction was held in an online format. I used WhatsApp as instructed by the school. Previously, the school adopted Google Classroom as the main platform of instruction. However, due to poor internet connection, WhatsApp was used to facilitate the teaching process. One thing that I noticed during the class discussion through the application was that students were relatively unresponsive and passive. (Participant 5)

Another question posed in the interview regarding the efforts to make class instruction through mobile devices more effective also revealed some implications for the development of mobile technology for language learning and instruction. The participants agreed that there is a

need for training to properly use mobile devices in class. As previously highlighted, teaching using mobile devices is still relatively uncommon among teachers. Many teachers continue with their traditional styles of teaching which exclude the use of mobile devices. Beliefs and attitudes toward the application of mobile technology should be reshaped to embrace the changes resulting from the integration of mobile devices in their class. Therefore, the support from schools and stockholders to facilitate intensive training for teachers is deemed necessary. A participant explained:

> .... even, I still find teachers find difficulties using mobile devices to conduct instructional practices. Thus, they might need training or participate in workshops to improve their technological competence. Lastly, students need to use mobile devices with proper specifications. Some students might not have access to these devices. (Participant 20)

As for teachers, participants believed that a phase of adaptation is needed so that students can finally embrace the changes from the integration of mobile devices in their classes. Most students are familiar with their devices and they will likely have fewer difficulties operating various mobile applications on their devices. However, expanding the function of devices as a means of communication and even entertainment to instructional tools will require well-prepared and strategic guidance for students to prevent and alleviate the possible risks.

> … For students, knowing how to properly operate mobile devices for classroom instruction is necessary. It means that students might also need some training with their devices before proceeding with mobile learning…. (Participant 14)

Furthermore, the participants believed that schools need to take several steps to support the integration of technology-based instruction. For example, some participants suggested that schools facilitate WIFI connection with proper internet connection. Also, to support teachers' pedagogical development, schools need to properly provide training by inviting experts in educational technology or collaborate with higher education institutions to hold seminars or workshops regarding the use of technology education specifically mobile devices.

> … Schools need to support the integration of technology including mobile devices by preparing their teachers with training and workshop. … Schools also need to provide supporting facilities including a good internet connection and a number of mobile devices. (Participant 20)

Conclusion

The analysis of the interview excerpts collected from twenty participants was used to explain beliefs and attitudes of preservice teachers toward the use of mobile devices for EFL practice. To present holistic results, the analysis includes a discussion of the application of mobile devices as both learning and instructional tools. The discussion serves to answer three research questions regarding beliefs, attitudes, and factors affecting these beliefs and attitudes.

The findings for the first research question regarding EFL preservice teachers' beliefs about mobile technology during their teacher preparation program, I suggest two classifications of mobile devices as learning tools and instructional tools and two themes for each classification. First, as learning tools, participants believed that mobile devices could serve various purposes. Mobile devices were used to translate, practice language performance, and access multiple resources and references for language learning. Participants also mentioned their preference for mobile devices over other processing devices to support personalized learning as they offer portability, accessibility, and practicality. Regarding the possible challenges of mobile devices as learning tools, the participants addressed technical issues covering device performance and connectivity, social issues, and health issues. Second, as instructional tools, teachers can harness their mobile devices to gather and present attractive and comprehensive teaching content, develop more engaging learning experiences, and expand the class discussion and interaction with students. However, it is also important to notice the possible barriers to adopting mobile technology for class instruction including unequal access and digital skills among students as well as technology anxiety, and negative perspectives of technology among teachers. Overall,

participants believed that mobile technology for language learning and instruction could be harnessed to improve language performance as both learning and instructional tools.

The interview data for the second research question revealed the attitudes of EFL preservice teachers toward mobile technology for language learning and instruction. For this question, five themes emerged comprising attitudes toward mobile devices as learning tools, self-efficacy, attitudes toward mobile devices as instructional tools, concerns about integrating mobile devices into the classroom, and the prospect of mobile devices for class instruction. Specifically, the participants positively responded to the application of mobile devices as learning tools. They further asserted that they would continue using their devices for improving their EFL performance. Another point to highlight is their self-efficacy to use mobile devices as learning tools. They argued that mobile devices were relatively easy to operate for various functions and offer learning affordances. However, negative attitudes were demonstrated by the majority of the participants regarding the use of mobile devices as instructional tools. These negative attitudes stemmed from the lack of interest and disappointment that they experience during their student-teaching program. Interestingly, all participants acknowledge the rising popularity of this technology for class instruction.

The findings for the third question revealed different factors influencing EFL preservice teachers' beliefs and attitudes toward mobile technology for language learning and instruction. Using TAM and self-efficacy theory, I used the elements of these theoretical frameworks to answer the questions which led to the use of codes such as perceived ease of use, perceived usefulness, experience with mobile devices in classroom instruction, and teaching experience with mobile devices.

In conclusion, participants provided valuable information to the field of MALL through their responses to the three research questions investigating beliefs and attitudes of preservice Indonesian students in a teacher preparation program.

Chapter V: Summary and Discussion

Introduction

This chapter presents the discussion of answers to the research questions. It begins with a summary of the research findings which serve as the foundation of the discussion. The discussion of the themes that were generated from the analysis in the previous chapter is connected to the current literature of related studies and theoretical frameworks comprising the Technology Acceptance Model (TAM) and self-efficacy theory. Based on the discussion, the recommendations and implications of the study for the current theories of pedagogical technology, instructional practices, and future studies are formulated. Finally, at the end of the chapter, a conclusion of this chapter and the limitation of the study are presented.

Summary of the Findings

This phenomenological study investigated Indonesian EFL preservice teachers' beliefs and attitudes toward mobile technology for language learning and instruction. Specifically, it shares data about the use of mobile devices as both learning and instructional tools from Indonesian EFL preservice teachers during their teacher training program. This study further explains the affordances, barriers, and influencing factors regarding the use of mobile devices for the aforementioned roles. The findings of this study are expected to contribute to the development of the curriculum in higher education specifically in the teacher training program by providing insights regarding the adoption of mobile technology from the perspectives of preservice teachers. This study is significant because it fills a gap in the research regarding pre-service teachers' use of mobile technologies for language learning and instruction.

To meet the objectives, this study recruited 20 EFL preservice teachers who studied and trained in an Indonesian university to be K-12 English teachers. The data for this study were acquired through semi-structured interviews. The summary of the findings is as follows:

1. All participants stated that they have used mobile devices as both learning and instructional tools despite their unfamiliarity with the concept of mobile learning or Mobile Assisted Language Learning (MALL). Mobile devices primarily serve as a tool to translate words, collect information or references regarding language content, and help practice language skills through mobile applications. Moreover, it also provides access to social media which allows them to watch multimedia content about language learning strategies.
2. All of the participants possessed technology self-efficacy and believed that they could skillfully utilize mobile devices as learning tools. Portability was the most frequently mentioned among all advantages regarding the use of these devices. As for the challenges of using mobile devices to learn EFL, they pointed out the technical limitations, learning distractions, and health issues.
3. Regarding the use of mobile devices as instructional tools, the participants believed that mobile technology could be harnessed to facilitate instructional practices under particular conditions: teachers' teaching strategies, students' conditions, and the availability of supporting infrastructure.
4. The participants believed that mobile technology could facilitate more diverse activities for their class and that the use of mobile devices as instructional tools would be more common in the future. Furthermore, they also stated that the global pandemic had driven teachers and students to utilize technology as the primary medium of instruction.

5. All participants showed positive attitudes toward the use of mobile devices as learning tools. They clearly stated that they would continuously use their devices for various activities that can improve their language performance.
6. The majority of the participants showed negative attitudes toward the use of mobile devices as instructional tools. They expressed their disappointment and reluctance toward the use of mobile devices for classroom instruction, especially at the middle school or lower levels.
7. All participants agreed that mobile technology for classroom instruction will be more popular. They also acknowledged that the integration of technology is inevitable
8. During the global pandemic, mobile devices were used as a medium of instruction. The participants mentioned that they used WhatsApp, a particular mobile messaging application, to facilitate classroom discussion. Some classes employed teaching platforms such as OnClass or Schoology which were accessed through mobile devices.
9. Some participants mentioned they had discussions about the use of mobile devices as instructional tools in their class. Also, the application of mobile devices in class was demonstrated by the instructors of two teaching methodology classes through the use of mobile games.
10. During the student-teaching program, the majority of the participants stated that they used mobile devices to access instructional platforms to facilitate classroom instruction due to the global pandemic.

Discussion of the Findings

The findings in chapter four presented EFL preservice teachers' beliefs and attitudes toward mobile technology for language learning and instruction. They further revealed the factors influencing these beliefs and attitudes. Chapter Five serves to point out the significance and implications revealed from the data analysis in Chapter Four. Connections to the theoretical framework are provided as well. The elaborated discussion to explain the answers to the research questions is presented in the following section.

Discussion of research question #1- What do EFL preservice teachers believe regarding the application of mobile technology for language learning and instruction during their teacher preparation program?

Through this question, I attempted to explain how the experience of using mobile devices as both learning tools and instructional tools has shaped the participants' beliefs about this technology. Overall, the findings indicated positive beliefs for the participants who employed this technology to improve their language performance, participate in their class discussions, and manage their classes. However, the data also revealed some concerns, barriers, and challenges to the implementation of mobile technology.

The following discussion elaborately explains the findings of the study from the perspectives of the participants as both language learners and instructors. The discussion also presents the significance of the findings and the implications. Connections are drawn to the theoretical models—TAM and self-efficacy theory.

Beliefs in the application of mobile technology for language learning

This first section discussed beliefs about mobile technology from the perspectives of the participants as EFL learners. It shows the emerging themes from the analysis comprising

multifunctionality, personalized learning, and challenges with the related literature. The elaborate discussion of the themes is as follows:

The study found that mobile devices served as content-resource tools that allowed participants to find potential resources to learn English more effectively and efficiently from language learning-focused websites or blogs through mobile search engines. Novels or other types of publications were identified as supporting a reading hobby or for studying particular subjects with more affordable costs compared to printed paper books (Fayed et al., 2013). This finding aligns with Chen et al. (2013) who claimed that using mobile devices to access e-books for extensive reading activities can potentially develop students' positive attitudes toward reading aside from enriching their vocabulary. This finding is significant because many e-book apps are available to download for free and offer appealing values due to their capability to present multimedia content (Zou & Thomas, 2018; Godwin-Jones, 2011). These apps also offer more interactive online content through touch control on the devices to provide a more engaging enjoyable reading experience (Nichols, 2016). Thus, it implies that mobile devices can be an appealing option to develop reading habits.

The findings highlighted another function of mobile devices as translator devices or mobile dictionaries. They mentioned the use of mobile dictionary applications and the online translation service which allow learners to look up meanings of foreign vocabulary instantly through their devices (Deng & Shao, 2011; Steel, 2012). It is also an important point to notice that several electronic or online dictionaries also provide a comprehensive grammatical explanation with sentence examples (Steel, 2012) through attractive user interfaces. These dictionaries are connected to a database that is continuously updated allowing users to obtain or verify new vocabulary. This implies that instructors can be assured that learners will be able to

learn the most recent usage of a term. Regarding language skills, Rahimi and Miri (2014) asserted that a mobile dictionary is significantly more effective to enhance students' vocabulary compared to a printed-paper dictionary. It presented more features to improve students' retention through a presentation of visual and audio content. Additionally, it facilitated pronunciation skills practice through the audio pronunciation feature.

Mobile devices offer numerous applications that are easy to download and operate. Each operating system offers digital markets which offer free or paid applications. For learning purposes, the findings indicated the use of mobile search engines to access references, translate difficult words, and gather necessary information for their learning (Burston, 2017; Terantino, 2016; Chinnery, 2006). Many mobile applications were designed specifically for language learning (e.g. Merriam Webster dictionary, Oxford dictionary, and Duolingo) and language testings (e.g. TOEFL Score or IELTS). These applications, especially Duolingo, have been subjects of investigation in many studies (e.g. Seilstad, 2012; Ajisoko, 2020) to examine their effects on students' language competence.

Another important point of the implementation of mobile devices as learning tools is the access to social media through social media mobile applications. The study found that participants actively used their mobile devices to access popular social media such as Instagram, Facebook, and YouTube (Hruska & Maresova, 2020). Globally, Indonesia has become one of the highest numbers of users of this social media (Statista, 2021). This is an opportunity to use social media not only to build connections but also to gather language learning resources and references. Social media are free to download and provide access to a massive stock of references and content for learning English (Zain & Bowles, 2021; Albiladi, 2020). The participants commented that mobile devices were used to watch learning videos regarding

pronunciation, vocabulary, and grammar from Instagram. The finding aligns with the results presented in Erarslan (2019) regarding the use of Instagram as a learning platform to improve learners' EFL performance. The study implied that learners used Instagram as a supplementary learning reference to their formal teaching by language exposures and various language learning content.

Additionally, mobile devices could be used to receive and transfer multimedia content. Technology embedded in mobile devices has been progressively developed to match the ones featured in personal computers including access to multimedia content (Noyan & Kocoglu, 2019; Anglano, 2014). It is an important point since mobile device users can now access video or audio content through their mobile devices more easily through popular social media applications such as YouTube and Podcasts (Burston, 2017). The analysis revealed that multimedia content, especially videos, could provide better learning explanations for students. Seilstad (2012) asserted that videos are considered an engaging and attractive format of learning content than reading content from textbooks.

The findings in the study also implied the potential of mobile devices to support personalized learning. Mobile devices serve as a tool to personalize learning offering a set of options to accommodate their preferences or needs in learning. According to Qoussini, Jusoh, and Tabib (2015), this personalization refers to how mobile technology can be adjusted to deliver particular learning content and how it is presented to learners based on their needs. Rau, Gao, and Wu (2008) further implied that utilizing mobile devices managed to improve learning flexibility through ease of access to various learning references. This finding implies that students can be expressive as they are engaged in class learning collaboration and opt to work individually for self-directed learning.

The function of mobile devices to facilitate personalized learning is supported by their values. The finding in this study indicates the element of portability which serves as the primary value of mobile devices. Persson and Nouri (2018) as well as Mills et al. (2018) pointed out the value of portability which allows learners to access learning content or engage in learning interaction beyond the classroom setting through their mobile devices. The other two values that give mobile devices more advantages compared to other bigger processing devices such as laptops and PCs are connectivity and accessibility. Supported by the ease of connectivity, mobile devices offer the ease of access to multiple resources beneficial for learning (Burston, 2017; Kondo et al., 2012). Mobile devices could serve as a medium to gather necessary information from various resources and references from academic databases such as ProQuest and Google Scholar as well as social media such as Instagram and Facebook (Fornara & Lomicka, 2019; Sung, Chang, & Liu, 2016; Wang & Vásquez, 2014; Gikas & Grant, 2013). Next, the current mobile devices are capable of performing tasks equally or even more efficiently than other computing devices. Lai and Zheng (2018) addressed this matter and explained how language learners could employ a sophisticated searching method of word meaning through their mobile devices by using varied mobile applications such as a mobile dictionary and search engines. Lastly, mobile devices can perform multitasking. The study indicated participants' preferences to use mobile devices as learning tools as they can operate them with one hand for learning languages while they are doing other activities with another hand (Triplett, 2018).

The study identified the possible challenges of using mobile devices for self-directed learning. The primary challenge concerns the technical limitations of mobile devices such as low-speed internet connectivity, poor device performance, and limited memory storage. Participants complained about the poor internet connection as they found it difficult to operate

their devices to access learning resources and watch multimedia content. As a nation, Indonesia is still doing its best effort to build robust Information Technology (IT) infrastructure. Thus, the internet service is not equally optimal in all areas indicating the gap in technology between urban and suburban or even rural areas (Zainuddin, 2017). This finding resonates with other studies such as Ataeifar et al. (2019) and Viberg and Grönlund (2013). These studies highlighted poor internet connection as a challenging issue to access content and become subject to disturbances to complete any of their online assignments as the majority of mobile device-assisted learning relied on the internet connection (Ataeifar et al., 2019; Viberg & Grönlund, 2013).

Another issue regarding the use of mobile devices dealt with technical limitations. Aligned to the findings reported in Ahn (2018), old devices could not perform the tasks optimally due to outdated hardware or low specifications. Also, some mobile applications took up a lot of memory space which directly affected devices' performance. Other technical drawbacks are the limit on message length, restrictions on audio-visual communication, and the need for mobile devices with certain specifications that some students cannot afford (Tafazoli et al., 2018; Metruk, 2020).

The study reported that participants were susceptible to learning distractions from their devices, especially message and social media notifications on their mobile devices. A similar issue was highlighted by Yau and Joy (2011) who asserted that it is easy for students to get distracted and deviate from the main learning objectives as they use mobile devices during learning due to their close connection with their mobile devices in their daily life. The study also reported that the participants mainly used their mobile phones for communication and entertainment. Thus, they could not rely solely on their devices as the primary learning tools although they believed that their mobile devices might assist in learning.

The study also indicated participants' concerns regarding health issues including the risk of addiction to mobile devices. Primarily, there was a strong attachment to mobile devices which led to the ignorance of time and surroundings. Additionally, the participants mentioned that staring at screens for a long period could pose harm to eyesight. Similar to this finding, Yu (2018) reported students' complaints as they strained their eyes to see their screen for a long period. In addition, the study indicated students' cognitive overload as they were assigned to read their reading texts on their small smartphone screens.

Beliefs in the application of mobile technology for instructional tools

Mobile technology for classroom instruction served various roles which directly affect the quality of instruction. From the analysis, participants believed that mobile technology offered various affordances that help elevate the quality of classroom instruction. For instance, it allows teachers to construct lessons that incorporate both different and collaborative models of instructions (Kukulska-Hulme, 2013), engaging and competitive activities (Reynolds & Taylor, 2020; Wichadee & Pattanapichet, 2018; Zarzycka- Piskorz, 2016), and more extensive learning opportunities (Kukulska-Hulme & Shields, 2008; Huang et al., 2012).

Due to the global pandemic, the study also implied the significant role of mobile technology to facilitate remote interaction between the instructor and students or among students (Moorhouse & Beaumont, 2020). Yeap, Ramayah, and Soto-Acosta (2016) asserted that mobile technology also makes it possible for learners to access remote or virtual classes. This access is further strengthened by various teaching platforms such as Google Classrooms, ZOOM, or Padlet granting students and the teacher the opportunities to interact in engaging ways on their mobile devices. The affordance of mobile technology for remote learning was also highlighted

by Chen and Lin (2018). This study showed that students considered the mobile application-based assignment helpful as they were engaged in a distant interaction.

Regarding language learning, various studies provided evidence that incorporating mobile technology into classroom instruction could improve students' language performance. Simultaneously, teachers can harness their creativity to develop learning activities that suit different students' learning styles (Al Qasim & Al Fadda, 2013). For instance, YouTube and online learning videos presented engaging and comprehensive learning content and provided engaging and enjoyable teaching models (Imelda, Cahyono, & Astuti, 2019; Seilstad, 2012). From images in the videos, abstract vocabulary and concepts can be well described and explained (Chen, 2020). The embedded media player in the mobile device could play English songs or Podcast videos which help students to practice their listening skills (Al Qasim & Al Fadda, 2013; Fayed, Yacoub, & Hussein, 2013). Participants also shared their idea to use mobile devices to practice students' speaking skills by utilizing the voice recording feature or particular mobile applications (Grimshaw & Cardoso, 2018; Ataeifar et al., 2019). As for reading, they found varied reading content from the internet and presented it in the classroom.

Additionally, the study highlighted the function of mobile devices to create, transfer, and play multimedia content such as videos, images, and audio. For instructional purposes, the participants presented educational multimedia content they collected from multiple resources in their classes through mobile devices (Uluyol & Agca, 2012). The participants asserted that using this type of content might increase learning effectiveness and improve students' learning motivation. In addition, participants used their devices to record themselves teaching the lesson through mobile devices and shared it with their students on an online platform.

Adopting mobile devices for language instruction allows the creation of new learning atmospheres which positively affect their students' learning motivation and engagement (Kassem, 2018; Terantino, 2016). However, there was some concern about how mobile devices could be used optimally in teaching practice and the barriers to the application. From the findings, there were three main concerns expressed by participants regarding the implementation of mobile technology for classroom instruction. For the first concern, participants believed that mobile devices should be restricted for non-primary learning activities in in-person classes. For example, teachers could use their devices to provide ice breaker activities or to translate difficult words. This study indicated participants' doubts that the risks of mobile technology might overwhelm the benefits. Thus, allowing students to use mobile devices while making some restrictions was deemed the most reasonable option as the initial stage for the integration of this technology. This finding aligns with the findings by Yeap, Ramayah, and Soto-Acosta (2016) who concluded that mobile devices might serve better as a medium for supplementary learning activities to help students with self-directed learning. Specifically, the use of mobile devices is well suited for short-duration courses that are coupled with specifically developed learning materials.

Another concern was the students' education level and digital skills. The study revealed participants' beliefs on the integration of mobile technology for particular education levels of students. Using mobile devices posed students with distractions, especially for those below the high school level. Studies by McCoy (2013) revealed that the age range of the most active mobile device users is primarily between 18 to 24 years. Thus, younger learners, who supposedly experienced less exposure to mobile devices, might be tempted to misuse their mobile devices when they are instructed to use them during class. They are also prone to distractions such as

noises made by mobile devices (Vuong, Tan, & Lee, 2018). Furthermore, the study noted the gap among students in terms of digital skills. The participants explained that students possess varying levels of technology depending on their experience and their social background. Some students possessed low digital skills exposing a threat to the implementation of mobile technology (Kan & Murat, 2020). Regarding this matter, Chen and Lin (2018) agreed students required special training or preparation in operating mobile devices as they reported some difficulties in editing videos that were a part of their assignment. Aside from the preparation, Le (2019) further suggested that teachers should include fun activities to reduce the demotivating affective learning factors due to low digital skills and successfully achieve the learning objectives.

The third concern deals with the supporting infrastructure. The most frequent application of mobile technology for classroom instruction such as the distribution of learning content and remote or blended learning requires a fast internet connection. Additionally, students need mobile devices with good specifications to perform particular tasks. Therefore, schools should be ready with infrastructures that support the optimal application of mobile technology including fast internet connectivity and, possibly, devices with the required specifications (Tsai, 2015; Sykes, 2018). Fernández et al (2019) and Bethel et al. (2011) argued that the success of technology integration in the classroom relies on various factors including the robust infrastructures to facilitate technology-based learning and available support for students to develop their digital skills

The study also indicated several barriers to the effective application of this model. According to Albadry (2017), teachers and teaching experts are well informed about the benefits drawn from mobile devices. However, any educational technology poses certain barriers and issues as it is used in class without sufficient knowledge about the effects on students (Alavi,

Borzabadi, & Dashtestani, 2016; Ebadi & Goodarzi, 2017). For instance, the participants noted students living in rural areas do not have equal access to mobile technology. Some students needed to use their parents' devices to learn or access the class which became a significant barrier to the application of online learning or blended learning (Giang, 2016; Li, Jee, & Sun, 2018). There is also an issue regarding the inequality of students' digital skills. Each student has technology aptitude which ranges from low to high. For teachers, it can be an issue as students would gain more burden as some of them might encounter technical difficulties to use their devices properly in class. A study by Bailey et al. (2017) noticed that employing social media Facebook for collaborative tasks could be distressful for students. Also, low competent students are likely to experience learning anxiety (Bailey, 2019). Using mobile devices in a collaborative learning setting can make students confused due to their lack of understanding of the learning content and the feeling of embarrassment toward others should they fail to accomplish the task (Albadry, 2017).

The issue of unequal digital competence was not only found among the participants' students. Many teachers are still prone to technological anxiety. Fernández-Batanero et al. (2021) asserted that teachers' disapproval of technology adoption for instructional practice emerges due to a lack of knowledge and experience. In a study examining the effectiveness of Kahoot!, Reynolds and Taylor (2020) mentioned in their study that several teachers doubted the effectiveness of this technology on students' learning progress and leaned toward the conventional model. These views toward learning coupled with the lack of digital skills might prevent teachers from exploring the potential of mobile devices for language learning. Cárdenas-Moncada et al. (2020) as well as Nalliveettil and Alenazi (2016) inferred that unfamiliarity with the adopted applications was likely to fail the effective integration of mobile technology.

The study also highlighted the challenge to adopt mobile technology in terms of monitoring students' actions during class. Inability to monitor students' actions might cause issues with the adoption of mobile devices in class as students might not focus on the learning process and, instead, misuse their devices. (Ahmed, 2019; Alkhoudary & AlKhoudary, 2019; Joo, Park, & Lim, 2018; Shifflet & Weilbacher, 2015; Wildner, 2013). Yau and Joy (2011) found that students were easily distracted by noises from their mobile devices.

In conclusion, the majority of participants believed that the use of mobile devices could positively contribute to the process of language learning and instruction. As learning tools, mobile devices offer portability, accessibility, and various functions (Ahn, 2018; Ifeanyi & Chukwuere, 2018; Cumaoglu, 2015). Due to the familiarity, all participants agreed that mobile devices were relatively easy to use. As instructional tools, mobile devices could potentially be harnessed to develop the instructional process. Teachers can expand the classroom discussion and interaction, arrange for students to work collaboratively, and engage them in interactive and competitive language teaching activities through gamification (Burston, 2015; Terantino, 2016; Yu, 2018). However, the possible technical issues and health risks as well as instructional barriers which include unequal access to mobile technology and unequal digital skills should also be taken into account.

Discussion of research question #2- What attitudes do EFL preservice teachers demonstrate toward the application of mobile technology for language learning and instruction?

The second question of this study attempted to reveal the attitudes of EFL preservice teachers regarding the use of mobile devices as a tool to improve their EFL performance and a tool to improve instructional practice. The finding showed participants' positive attitudes toward

using mobile devices as learning tools. The participants were certain that they would use their devices more intensively and extensively to assist in learning. However, the study indicated negative attitudes among participants regarding the use of mobile devices as instructional tools. The following sections present a discussion to bridge the finding of this study and the related literature.

Attitudes toward mobile devices as learning tools

This study indicated positive attitudes toward the use of mobile devices as learning tools. The data of the interview revealed that mobile devices were well accepted by the participants and they suggested a more intensive use of their devices. Mobile devices were considered practical, portable, and accessible among participants. In line with this finding, Lai and Zeng (2018) and Wu (2019) delved into students' experiences to harness their mobile devices as supporting learning tools. The study revealed that students employed mobile devices for their learning mostly as an instrument to support their learning styles. The finding also indicated students' positive attitudes toward the learning process. Thus, students' initiatives to learn a foreign language using mobile devices should be extensively reinforced to promote their respective more personalized learning models (Mills, Bolliger, & McKim, 2018; Pan, 2020).

The study implied that the acceptance of mobile technology was driven by the fact that the functions of mobile devices keep developing and the number of mobile applications for learning English, which is easier to use, sophisticated, and engaging, constantly increases (Şad & Göktaş, 2014). Hence, this acceptance encouraged the participants to explore the functions of their devices and use various mobile applications available on the market (Garcı, 2018; Mills, Bolliger, & McKim, 2018). Concerning this finding, Chen (2016) explained that the acceptance

of mobile technology is essential in the learning process as it affects users' intention to use their devices optimally for learning.

Self-efficacy emerged as another theme regarding the participants' beliefs about the use of mobile devices as learning tools. Substantially, the participants believed that they had the competence and skills to operate their mobile devices as learning tools. This confidence is important as it serves as a determining element in the successful application of technology (Hall & Trespalacios, 2019; Elstad & Christophersen, 2017; Hatlevik, 2017; Joo, Park, & Lim, 2018; Kan & Murat, 2020). The study also revealed that the participants have used their devices for language learning for four to seven years and mentioned using many learning applications including mobile dictionaries, search engines, and social media. Their experience with mobile devices for communication or entertainment helped them achieve adequate proficiency with technology. Regarding this matter, various studies concluded that the individuals' performance in using a particular form of technology such as mobile devices are shaped by their self-efficacy which stems from perceived ease of use of the technology and perceived usefulness (Saadé, & Bahli, 2005; Padmavathi, 2016; Hamid, Razak, Bakar, & Abdullah, 2016).

Attitudes toward mobile devices as instructional tools

The study indicated a mixed response regarding attitudes toward mobile devices as instructional tools. It is an interesting finding since all participants were aware of the affordances of mobile technology as instructional tools. In this study, their lack of experience or negative experiences with mobile devices as instructional tools led to various impressions including disappointment and lack of interest which were reported by the majority of the participants. These impressions strongly affected their intention to use technology and opposed their beliefs about the affordance of mobile technology. This finding supported the findings from Van Praag

and Sanchez (2015) who revealed that teachers allowed students to operate their mobile devices within a particular restriction. There was a tendency among the participants to ban the use of mobile devices despite their recognition of the affordances of this technology for language instruction. Without proper strategies, students might get distracted and lose their attention during the learning process. In another study by Şad and Göktaş (2014), the teachers implied their preference for laptops over mobile devices which was attributed to the fact that they had more first-hand experience with laptops than mobile devices to manage their classroom activities.

Interestingly, the study revealed an agreement that integrating technology including mobile technology is inevitable for future instruction. Technology continues to develop and the education field should be improved by integrating technology into its pedagogical practices (Chen (2016). Additionally, the number of mobile devices possession among students is increasing which increases the possibility of a policy for one-device one-student. Therefore, technology should be part of instructional practice to keep up with the stream of globalization which affects all aspects of humans' life. In addition, students should master not only academic or non-academic competence which are the current objectives of education, but they also need to embrace the essence of globalization by acquiring digital skills (Rodrigues, Cerdeira, Machado-Taylor, & Alves, 2021; Larson & Miller, 2011). Regarding the adoption of technology in language learning. Tayjasanant and Suraratdecha (2016) asserted that ASEAN countries have made various efforts to develop the current practices of EFL instruction and technology was deemed as the primary option to develop the educational policies and common beliefs of learning tradition. As the current concern of technology lies in mobility, the skills to operate mobile

technology are deemed necessary for the development of language learning (Duman, Orhon, & Gedik, 2014, Zain & Bowles, 2021).

Furthermore, mobile devices should be utilized for classroom instruction with particular strategies to draw their potential and avoid possible issues that alleviate their effectiveness. The findings suggested the use of mobile devices for ice breaker activities and other non-primary learning activities. For instance, mobile devices can be used as a translator, and media players to view video content only when deemed necessary. They argued that teachers should also be aware of the risks of this technology and wisely use it only when it is deemed necessary. In line with this finding, Van Praag and Sanchez (2015) revealed teachers allowed students to operate their mobile devices within a particular restriction. They found that there was a tendency among the participants to ban the use of mobile devices despite their recognition of the affordances of this technology for language instruction. Without proper strategies, students might get distracted and lose their attention during the learning process. In other words, students might not follow teachers' instructions and use their devices for non-learning matters which deviate from the main purpose of their learning (Ifeanyi & Chukwuere, 2018).

Discussion of research question #3- What factors affect these beliefs and attitudes?

Ajzen (1991) argued that attitudes connect personal beliefs and intention to perform particular actions. Specifically, beliefs strongly affect individuals' attitudes on a particular task. The nature of these beliefs is influenced by intertwining factors directly exposing the users of technology. Under the scheme of TAM and self-efficacy theory, this section reveals the factors affecting beliefs and subsequently attitudes of EFL preservice teachers toward mobile technology for language learning and instruction.

Perceived ease of use

Perceived ease of use is an essential factor that influences beliefs and attitudes toward the use of technology especially mobile devices. Perceived ease of use refers to the extent to which an individual is certain that technology can be operated with minimum effort (Lederer et al., 2000). In other words, perceived ease of use refers to the easiness level of the operation of a particular form of technology. The Technology Acceptance Model (TAM) (Davis,1989), which serves as the theoretical foundation of this study, acknowledges the significance of users' perceived ease-of-use to shape their attitudes toward technology. Davis (1989) implied that the level of acceptance shown by users' interest is determined by the level of easiness to operate the technology.

The study indicated participants' perceived ease of use toward the use of mobile devices. For participants, operating mobile devices were relatively easy as both learning and instructional tools. Unlike other processing devices, activating and operating mobile devices can be instantly done. Therefore, the participants preferred to use their mobile devices for simple and spontaneous tasks such as translating and checking pronunciation. Moreover, many applications share familiar user interfaces which require virtually no effort to learn. These findings resonate with the results of Chung, Chen, and Kuo (2015) which addressed the issue of the acceptance of mobile learning among EFL college students. The study suggested that perceived ease of use, compatibility, as well as perceived ease of use and self-efficacy, suitably predict users' intentions to employ their mobile devices to access learning content focusing on English vocabulary. Additionally, of all those predictors, compatibility was found to be the most prominent predictor for students' indication to use mobile devices for learning.

The participants preferred mobile devices to other processing devices due to their portability. With their relatively small sizes, it is easy to carry mobile devices anywhere and use

them anytime they want (Zain & Bowles, 2021; Mills, Bolliger, & McKim, 2018). Additionally, mobile devices can be operated with one hand allowing participants to do multiple tasks at once. In this case, several participants mentioned that they used their devices to read articles while doing other activities such as having lunch or listening to music.

Perceived usefulness

Perceived usefulness is another cognitive factor that determines the acceptance of technology. According to TAM, perceived usefulness concerns affordances and positive effects as a result of operating technology. Along with perceived ease of use, perceived usefulness stimulates the acceptance of technology which is signified by the user's intention and attitudes toward the use of technology (Tahar, Riyadh, Sofyani, & Purnomo, 2020; Brandon-Jones & Kauppi, 2018). To put it simply, individuals will be encouraged to use a particular form of technology due to the positive effects it has on their actions or performances.

From the interview, it can be concluded that the participants were in favor of the use of mobile devices as both learning and instructional tools. As learning tools, the study revealed that mobile devices have served multiple functions which help EFL preservice teachers improve their language performance. Mobile devices provide access to broader information and references which are helpful for the language learning process (Thieman & Cevallos, 2017; Yang, 2020). Since mobile devices can perform as equally well as other larger computing devices such as laptops and personal computers, participants found it more convenient to perform active and passive learning such as browsing articles and reading blogs about language on their mobile devices. Besides, various language learning applications are available to download for free such as mobile dictionaries, learning applications, and language testing applications (Zain & Bowles, 2021; Van Praag & Sanchez, 2014; Burston, 2017). Serving primarily as a communication

device, mobile devices can be used to expand interaction and provide more opportunities for participants to communicate ad practice their language performance through their devices (Noyan & Kocoglu, 2019; Hazaea & Alzubi, 2018; Tarighat & Khodabakhsh, 2016). Finally, mobile devices allow participants to access social media in which they can find various information and learning content as well as broaden their network for supporting their language learning (Mills, Bolliger, & McKim, 2018; Liu & Wu, 2016).

As instructional tools, the participants asserted that mobile devices can facilitate a more extensive learning model through remote or blended learning. In other words, mobile devices can connect students with their classes without being restricted to time and place (Terantino, 2016; Yang, 2013; Viberg & Gro¨nlund, 2013). With mobile devices, teachers can also develop engaging and attractive learning activities by incorporating gamification or project-based learning by incorporating mobile devices (Ishaq et al., 2021; Perry, 2015). Also, teachers can harness their devices to visit language learning-dedicated websites, blogs, online journals, and even social media to get the latest update regarding the trends in language teaching and find strategies and tips that can help improve their teaching (Burston, 2017; Van Praag & Sanchez, 2014). In this regard, a participant mentioned using Kahoot!, as a learning assignment and found that students were motivated to participate in the game. In addition, the study implied that mobile devices provide access to unlimited information that is necessary for teachers to keep in touch with the latest trend in language learning.

Self-efficacy elements

Under the scheme of TAM, both perceived use and perceived usefulness are influenced by external variables which come from individuals' experience with mobile devices. In this regard, to further explore these variables, I need to explain the experience of EFL preservice

teachers as users of mobile devices in their attempt to improve their language competence and in their effort to achieve digital skills as language instructors. Thus, the experience I refer to included their personal experience using their devices as independent learning tools, assisting tools for classroom interactions, and instructional tools during their student-teaching program.

Regarding the use of mobile technology for independent learning tools and assisting tools for classroom interactions, the study identified that the perceived usefulness of mobile devices among participants was also related to their enactive mastery and vicarious experience. According to Staples et al. (1999), enactive mastery refers to information that is acquired concerning an individual's accomplishment. It can positively or negatively affect an individual's self-efficacy depending on the nature of the accomplishments (success or failure). In the previous section, the participants mentioned that they were confident in their ability to proficiently utilize their devices and approved of the benefits of mobile devices as language learning tools. Their first-hand experience with mobile devices for years allowed them to successfully operate their devices to provide access to various learning references, mobile translators, and media players for multimedia content (Burston, 2017; Van Praag & Sanchez, 2014). Mobile devices also served as the primary access to social media which facilitates useful links, posts, and content that participants can refer to during their independent language learning (Albiladi, 2020; Erarslan, 2019; Fornara, & Lomicka, 2019). Furthermore, engaging in a class in which the instructor successfully demonstrated how mobile devices facilitated class instruction allowed participants to acquire vicarious experience. This element of self-efficacy concerns individuals' images based on their observation of particular actions conducted by others (Staples et al., 1999). In their classes, all instructors opted to use mobile messaging applications like WhatsApp or teaching platforms such as OnClass or Schoology to facilitate classroom interaction. All in all,

participants build their positive beliefs of mobile technology as their language learning tools from their positive experience with their mobile devices for independent learning tools and access to classroom instruction.

Two elements of self-efficacy were identified according to the participants' experience in using mobile devices as instructional tools. First, Participants demonstrated enactive mastery. Based on the findings, during their student teaching program, several participants mentioned that they fully conduct their instructional practice through their smartphones. Using mobile devices for this function was deemed as easy as using bigger devices such as laptops (Yang, 2020). This ease of use of mobile devices was echoed by a participant who prefers to use mobile devices to her other computational devices to access teaching platforms. Some participants added that, on some occasions, they accessed their online class through mobile devices and provide instruction through the feature of a video conference. Mobile devices construct a learning network to communicate with their students (Burston, 2017). Sharples et al. (2007) asserted that mobile learning bridges interactions among different individuals involving a transfer of knowledge in a collaborative learning setting. Mobile learning supports social interaction which is now broadly enhanced by the communication features of mobile devices. This element underpins the concept of the socio-constructivist theory stressing the importance of students' collaboration to construct knowledge.

The second element is physiological arousal. According to Staples et al. (1999), physiological arousal refers to an individual's capability to evaluate the difficulties of particular tasks and complete them which is affected by the impacts of those tasks. The participants reported that their students struggled to use mobile devices as a medium of class interaction and became relatively passive during the instructional process. They only responded when teachers

individually pointed at them to answer questions. In addition, they claimed that mobile device-assisted learning tends to be teacher-centered and made it difficult to provide oral feedback. This kind of experience led to a skepticism that using mobile devices could be very challenging in class (Wang & Vásquez, 2014). On the contrary, another participant argued that using mobile devices can be an enjoyable experience for students. She used a mobile game, Kahoot! in her class and managed to actively engage students and develop their learning motivation. This participant expressed her optimism that mobile devices could be more popular in the future and she was more triggered to explore the potential of this technology.

Implications and Recommendations

This study provides descriptions of how mobile devices have been harnessed by EFL preservice teachers as learning and instruction tools. It shows the areas in the adoption of mobile devices that need attention and improvement including the current barriers and limitations. Thus, the following section presents implications regarding related theories, pedagogical practices, and future studies. Based on these implications, this study also presents recommendations based on the related literature as well as inputs and suggestions from the participants.

Theoretical implications

The study revealed beliefs and attitudes of EFL preservice teachers in Indonesia regarding the application of mobile technology for language learning and instruction. Additionally, the factors influencing both constructs are defined and explained elaborately. In this regard, the findings and the analysis from the interviews affirmed the claims in the theoretical frameworks employed in this study.

First, this study implies the significance of perceived ease of use and perceived usefulness which strongly affect beliefs and attitudes to employing mobile technology as both

learning and instructional tools. This finding aligns with TAM which suggests attitudes or behaviors of users of technology are determined by perceived ease of use and perceived usefulness. Furthermore, this model also suggests that external variables affected the previous two constructs. From the findings, the participants explained their reasons for using their devices as well as their preferences. Their responses indicated their positive beliefs which resulted from the perceived ease of use and perceived usefulness. Specifically, the elements of portability, accessibility, and practicability enhanced the value of mobile devices especially mobile phones in comparison to other larger computing devices such as laptops or personal computers (Zain & Bowles, 2021; Metruk, 2020; Terantino, 2016).

Second, the findings confirmed the significance of various variables in self-efficacy theory which influenced participants' confidence in operating their mobile devices as both learning and instructional tools. This study found that participants were affected by their enactive mastery, vicarious experience, and psychological arousal from their experience in using mobile devices as learning and instructional tools. The lack of verbal persuasion indicated the need to include an elaborate discussion of the latest technology development especially mobile technology in the curriculum development of the teacher training program.

Practical implications

The study describes beliefs and attitudes of EFL preservice teachers toward the use of mobile devices which reflects the latest trend in the application of mobile technology. Specifically, the findings of this study can serve as a reference for conducting studies concerning mobile technology. For instance, perceived ease of use and perceived usefulness toward mobile devices as both learning and instructional tools were indicated. It means that the findings aligned with the framework of TAM. However, the findings also indicated the use of smartphones as the

primary device among participants. Thus, studies examining different types of mobile devices with different characteristics such as tablets might yield different results regarding their functionality.

Also, regarding the future use of mobile devices as instructional tools, future studies can address the pedagogical development of preservice teachers due to the impacts of mobile devices on their classroom practices. The study indicated the rising trend of mobile as reflected by the notion and knowledge of the participants to explicitly explain their particular functions for learning and instructional purposes. Therefore, an elaborate study specifically focusing on how mobile devices affect the development of EFL preservice teachers' language performance and their digital skills could be interesting topics to explore.

Finally, the study only centered on the perspectives of Indonesian EFL preservice teachers who possessed unique ways of harnessing their mobile devices as learning and instructional tools. Although the findings reported essential information regarding the use of mobile devices as both learning and instructional tools, the research methodology required a small number of participants which subsequently restricted the transferability of the findings. Thus, future studies are expected to examine beliefs and attitudes of participants with different socio-cultural backgrounds and more diverse experiences with mobile technology to facilitate a wider coverage of studies in this area and provide more in-depth research findings.

Pedagogical implications

The findings indicated that the participants are fully aware of the affordance of technology for instructional objectives. However, according to Schnackenberg et al. (2014), the notion of effectively integrating mobile devices for classroom instruction might not be entirely embraced by many professional teachers or teacher candidates. This notion should be taken into

account as part of their teacher preparation program. Due to the complexity and subjectivity in the integration of mobile devices, EFL preservice teachers must have the ability to evaluate and measure the effectiveness of this technology. They must also have a particular awareness of the threats of mobile technology that cause students to lose their focus as they use their devices to join online chatting, play games, or merely browse the web (Viberg & Grönlund, 2013; Gikas & Grant, 2013; Metruk, 2020). For these reasons, the need to create a path for the integration of mobile technology into the education system is no longer avoidable (Van Praag & Sanchez, 2015). As the first step, the curriculum in higher education for the EFL teacher preparation program should provide a space for mobile technology. Including the discussion of mobile technology in pedagogy-oriented or technology-oriented classes and even designing a mobile technology-oriented class should be taken into account. Also, modeling for the current preservice teachers should be provided by demonstrating the proper use of mobile devices in the actual class during the program. Thus, instructors should be well prepared for the integration of mobile devices in their classes (Hlas, Conroy, & Hildebrandt, 2017).

Furthermore, this study implied the need for collaboration between schools and higher education for the successful integration of mobile technology. Menon, Chandrasekhar, Kosztin, and Steinhoff (2020) asserted that integrating mobile devices in classroom practices requires careful preparation by considering the strengths and limitations of the devices and the impacts they have on instructional practices. From the study, it was found that the participants were spontaneously driven to use mobile devices as instructional tools with no proper preparation during their student teaching. However, their experience with mobile devices as learning tools helped them formulate strategies with the necessary actions to utilize their devices and subsequently learned how to improve their use and achieve the utmost benefits from their

devices. The participants further commented that they learned how to meet the objectives of the study, transfer teaching materials, and develop their class activities through mobile devices with or without the support of collaborating teachers.

Recommendations

The information and stories presented in this study are expected to be a reference for higher education and teaching preparation program curriculum designer and policymakers to consider incorporating the notion of effective use of mobile devices in foreign language teaching and learning in Indonesia. As learning tools, the use of mobile devices is positively accepted by EFL preservice teachers as implied by their positive beliefs and attitudes. The findings also indicate the positive impacts of mobile devices as instructional tools. However, as the participants shared their experience in using mobile devices as instructional tools, several caveats should be addressed to prepare EFL preservice teachers for more effective application of mobile devices in their future EFL classes. Therefore, I propose four recommendations: (1) offer pedagogical technology-oriented classes; (2) incorporate technology-based instruction for the offered courses for higher education institutions; (3) improve the infrastructure in higher education institutions to accommodate the technology-oriented policy as an effort to enhance preservice teachers' digital skills; and (4) build a system that bridges communication between higher education and schools.

The first recommendation deals with the preservice teacher program to offer pedagogical technology-oriented courses which incorporate the idea of integrating mobile technology and the latest trends of technology in the education field. The participants explained that they learned about how to harness technology in their class. Some participants enrolled in a technology-oriented class namely CALL (Computer-Assisted Language Learning) which presented an

introduction to various instructional platforms such as Padlet, Google class, and ZOOM and trained them to effectively incorporate these platforms in their future classes. However, they argued that there was no discussion specifically addressed the application of mobile technology for language learning and instruction. Furthermore, all participants were required to take TEFL (Teaching English as a Foreign Language) class which also included no particular discussion on this topic. Facilitating EFL preservice teachers with discussions about the latest trend of pedagogical technology through updated pedagogical technology-oriented classes is necessary to broaden their perspectives of the current trends and the possible direction of the development of pedagogical technology which includes mobile technology. However, designing technology-related classes can be very challenging as the learning content for class discussion must be continuously updated. Additionally, the instructors of these classes are required to update their digital skills and upgrade the curriculum based on the latest trends.

The second recommendation is for higher education institutions to incorporate technology-based instruction into the offered courses. For EFL preservice teachers to fully embrace the concept and notion of technology integrated classes, acclimatization to pedagogical technology is deemed essential. Hence, there is an urge to expose them to technology use in their classes as frequently as possible. To achieve this goal, instructors should be directed to adopt technology and be prepared with technology integration in their classes. For EFL preservice teachers, their instructors may serve as examples that provide either positive or negative encouragement for adopting technology in class. Successful modeling from the instructors will lead to positive encouragement to adopt technology for EFL preservice teachers.

The third recommendation is to enhance the infrastructure in higher education institutions to accommodate the technology-oriented policy as an effort to enhance preservice teachers'

digital skills. Without sufficient technology support, the idea to produce highly digitally skilled teachers in the future will never progress. Liu and Chao (2018) emphasized the significance of supporting infrastructure to accommodate technology integration. In a more recent study, Alhinty (2016) strongly recommends that technological infrastructure be established to fully adopt the mobile learning concept for actual instructional practices. Therefore, for preservice teachers to be proficient with technology especially mobile devices, a solid infrastructure that supports the integration of mobile technology is deemed essential.

The last recommendation is for the higher institutions to present special programs to support EFL preservice teachers' digital skills development focusing on mobile technology for actual classroom instruction. Thus, there is a need for the higher institution to facilitate EFL preservice teachers with some workshops, seminars, and particular training to proficiently utilize their mobile devices for instructional practices. Also, collaboration between schools and higher education institutions is necessary for creating a system that supports the adoption of technology at all levels of education. The participants explicitly mentioned that during their student teaching program, the majority of their collaborating teachers were not quite proficient with their devices. Mobile devices were commonly used for communication, and these teachers did not have the expertise to utilize mobile devices beyond that function. Some teachers especially the elderly even experience technology anxiety which hindered the adoption of mobile technology. For this reason, a robust system bridging communication between higher education and schools is required. This system will accommodate ideas from both parties and provide access to teachers who seek assistance in their effort to employ pedagogical technology. If necessary, external parties with the expertise in technology can be involved to alleviate any technology-related issues and facilitate guidance for establishing well maintained technology-based facility.

The emergence of the global pandemic has forced teachers to adopt technology including mobile devices to support their instructional process (Moorhouse & Beaumont; 2020). Slowly but surely, teachers practiced harnessing the existing technology while attempting to avoid any unnecessary action for the effective application of mobile devices.

Study Limitations

This study contains a few limitations regarding the methodology and the findings. For instance, it employed a qualitative approach with a limited number of participants of EFL preservice teachers of a teacher preparation program in Indonesia. Hence, the methodology restricted the transferability of the results for different participants with different socio-cultural backgrounds and nations with different IT infrastructures supporting the integration of mobile technology. Also, according to Venkatesh et al. (2003), affective elements such as beliefs and attitudes are constantly changing. Thus, longitudinal studies with robust methodologies and multiple instruments were deemed necessary to capture a more dynamic shift in beliefs and attitudes. The other limitation concerned the participants' responses to interview questions. All participants preferred to use their native language, Bahasa Indonesia, for the interview. They mentioned that they felt more comfortable expressing their thoughts in their native language. Hence, the data required translation to English for the process of analysis. Despite participants' confirmation for the interview script and translation, a few details could be missing due to the translation. Additionally, the translation did not involve other parties and was done solely by the researcher due to particular reasons. Despite the qualifications and competence of the researcher to translate the scripts from Indonesia to English, there could be a concern about the validity of the translation.

Conclusion

This study is primarily aimed to examine beliefs and attitudes of Indonesian EFL preservice teachers toward the use of mobile devices such as smartphones or tablets for learning and instructional practice in Indonesia. Subsequently, this study attempted to reveal the connection between their beliefs and attitudes and the factors affecting these two constructs. All addressed issues were formulated into three research questions.

A qualitative analysis was employed to answer the research questions. A total of 20 EFL preservice teachers from an Indonesian teacher preparation program were purposefully recruited to participate in semi-structured interviews. The data collected in this review revealed beliefs, attitudes, and influencing factors of these two constructs. The findings revealed participants' beliefs that mobile devices could positively contribute to the development of language performance as learning tools and the development of language instruction as instructional tools. As learning tools, mobile devices serve various functions that support language learning and facilitate personalized learning. As instructional tools, the use of mobile devices can potentially elevate the quality of EFL instructions by improving students' language skills, developing classroom activities based on teachers' creativity, managing multimedia learning content, and accommodating online learning.

Regarding attitudes of EFL preservice teachers toward the use of mobile devices for learning and teaching, this study revealed mixed responses. As learning tools, all participants expressed their positive attitudes toward this technology and intention to use this technology more intensively. As for teaching tools, the majority of the participants expressed their negative attitudes which were reflected in their disappointment through their experience during their student teaching program and their lack of interest to adopt this technology for their future

classes. However, they acknowledged that this technology was helpful to facilitate online learning and agreed that this technology would become more popular in the future.

Analysis of the data also revealed factors affecting beliefs and attitudes of preservice teachers toward the use of mobile devices as learning and instructional tools. Following TAM and self-efficacy theory, the study implied two main constructs affecting the use of mobile devices comprising perceived ease of use and perceived usefulness. Other factors affecting their self-efficacy toward mobile technology as learning tools comprised enactive mastery and vicarious experience. As for mobile technology as instructional tools, enactive mastery and physiological arousal were indicated as the influencing factors.

This study is significant considering the rapid development and prospect of mobile technology. First, it provides information regarding beliefs, attitudes, and the factors influencing these two constructs that is important for the effective application of this technology for language learning and instruction. Second, it presents implications and recommendations which can be a reference to optimize the integrated mobile technology for class instruction and identifies which aspects in the implementation of mobile technology that require further investigation.

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Appendix

Appendix A: Semi-structured interview questions

Participants' demography

1. What is your gender?
2. What is your age?
3. How long have you been using mobile devices for learning or instructional objectives?
4. What level do you consider yourself as a mobile device user?
    a) Very proficient
    b) Proficient
    c) Moderate
    d) Low
    e) Very low

Research Question 1: Beliefs toward mobile devices (MALL)

As an independent learning support

5. How can mobile devices help you learn English?
6. How has using a mobile device helped (or has not helped) you learn English?
7. How easy/difficult is it to use mobile devices to learn English? What makes it easy/difficult?
8. What do you like about using mobile devices for learning? (If any)
9. What do you dislike about using mobile devices for learning? (If any)

As an instructional tool

10. What do you think about instructors asking students to use mobile devices for learning?
11. Please describe an effective application of mobile devices for language class instruction?
12. What kind of class activities benefited most from mobile device support?
13. What kind of class activities benefited least from mobile device support?
14. What are the possible benefits of using mobile devices for class instruction?
15. What are the possible challenges of using mobile devices for class instruction?
16. What can you suggest to make class instruction through mobile devices more effective?
17. How popular do you think MALL will be for class instruction in the future? Why?

Research Question 2: Attitudes toward mobile devices (MALL)

As an independent learning support

18. Knowing the benefits and challenges of MALL, how will you use your current mobile devices for learning English? Why?
19. How do you think you will use mobile devices for your future English language learning?

As an instructional tool

20. How do you think you are going to use your mobile devices to teach English in the future?

Research Question 3: Factors Affecting EFL Preservice Teachers' Beliefs and Attitudes toward MALL

21. What kind of mobile devices do you own and use?
22. How have you used your mobile device(s) for independently learning English?
23. What experience do you have in using your mobile device(s) for any of your classroom activities? (If any)
24. What kind of experience do you have in any course in which the instructor uses his/her mobile device as an instructional tool? If any, tell me your experience in these courses?
25. What kind of experience do you have with any technology-oriented class which includes a discussion of mobile learning? (If any)
26. What kind of experience do you have with mobile devices for classroom instruction during your internship in school? (If any)

Appendix B: Semi-Structured Interview Questions (with Indonesian Translation)

Participants' demography

1. What is your gender?
   Apakah gender anda?
2. What is your age?
   Berapa usia anda?
3. How long have you been using mobile devices for learning or instructional objectives?
   Sudah berapa lama anda menggunakan mobile devices untuk kegiatan pembelajaran atupun pengajaran?
4. What level do you consider yourself as a mobile device user?
   Menurut anda, pada level apakah kemampuan anda dalam menggunakan mobile devices?
   f) Very proficient
      Sangat cakap
   g) Proficient
      cakap
   h) Moderate
      Biasa/cukup cakap
   i) Low
      Kurang cakap
   j) Very low
      Sangat kurang cakap

Research Question 1: Beliefs toward mobile devices (MALL)

Pertanyaan penelitian 1: Pandangan/keyakinan terhadap mobile devices (MALL)

As an independent learning support

Sebagai alat pembelajaran independen

5. How can mobile devices help you learn English?
   Menurut anda, bagaimana anda bisa menggunakan mobile devices untuk membantu belajar Bahasa inggris?
6. How has using a mobile device helped (or has not helped) you learn English?
   Sampai sejauh mana mobile devices telah membantu/tidak membantu anda untuk belajar Bahasa Inggris?

7. How easy/difficult is it to use mobile devices to learn English? What makes it easy/difficult?
   Seberapa mudah/sulitkan menggunakan mobile devices untuk belajara Bahasa inggris? Hal apa yang membuat mobile devices mudah/sulit untuk digunakan untuk belajar Bahasa Inggris?
8. What do you like about using mobile devices for learning? (If any)
   Hal apa yang anda sukai dari penggunaan mobile devices untuk pembelajaran? (jika ada)
9. What do you dislike about using mobile devices for learning? (If any)
   Hal apa yang tidak anda sukai dari penggunaan mobile devices untuk pembelajaran? (jika ada)

As an instructional tool

Sebagai alat pengajaran

10. What do you think about instructors asking students to use mobile devices for learning?
    Bagaimana pandangan anda jika ada guru/pengajar yang meninta siswa menggunakan mobile devices untuk belajar Bahasa Inggris?
11. Please describe an effective application of mobile devices for language class instruction?
    Jelaskan bagaimana mobile devices bisa secara efektif digunakan untuk kegiatan pengajaran Bahasa inggris di kelas?
12. What kind of class activities benefited most from mobile device support?
    Jenis kegiatan apa yang menurut anda memperoleh manfaat paling besar dari penggunaan mobile devices?
13. What kind of class activities benefited least from mobile device support?
    Jenis kegiatan apa yang menurut anda kurang memperoleh manfaat dari penggunaan mobile devices?
14. What are the possible benefits of using mobile devices for class instruction?
    Apakah manfaat yang mungkin diperoleh dari penggunaan mobile devices utuk pengajaran Bahasa Inggris di kelas?
15. What are the possible challenges of using mobile devices for class instruction?
    Apakah tantangan atau kesulitan yang mungkin dihadapi dari penggunaan mobile devices utuk pengajaran Bahasa Inggris di kelas?
16. What can you suggest to make class instruction through mobile devices more effective?

Hal apa saja yang menurut anda bisa dilakukan untuk membuat proses pengajaran Bahasa inggris di kelas lebih efektif dengan menggunakan mobile devices?

17. How popular do you think MALL will be for class instruction in the future? Why?
    Menurut anda, seberapa populerkah penggunaan mobile devices untuk pengajaran kelas di masa depan? Mengapa?

Research Question 2: Attitudes toward mobile devices (MALL)

Pertanyaan penelitian 2: sikap terhadap penggunaan mobile devices untuk pembelajaran/pengajaran

As an independent learning support

Sebagai alat pendukung pembelajaran independen

18. Knowing the benefits and challenges of MALL, how will you use your current mobile devices for learning English? Why?
    Setelah mengetahui manfaat serta tantangan dalam penggunaan mobile devices untuk pembelajaran, apakah kedepannya anda akan tetap menggunakan mobile devices untuk belajar Bahasa Inggris? dan bagaimana anda akan menggunakannya?
19. How do you think you will use mobile devices for your future English language learning?
    Menurut anda, bagaimanakah bentuk penggunaan mobile devices untuk pembelajaran Bahasa Inggris di masa yang akan datang?

As an instructional tool

Sebagai alat pengajaran

20. How do you think you are going to use your mobile devices to teach English in the future?
    Menurut anda, bagaimanakah anda akan menggunakan mobile devices untuk kelas yang anda ampu di masa mendatang?

Research Question 4: Factors Affecting EFL Preservice Teachers' Beliefs and Attitudes toward MALL

Pertanyaan penelitian 4: factor yang mempengaruhi pandangan/ kepercayaan serta sikap terhadap penggunaan mobile devices

21. What kind of mobile devices do you own and use?
    Sebutkan jenis mobile devices (contohnya, smartphone, tablet) yang anda miliki dan gunakan.
22. How have you used your mobile device(s) for independently learning English?

Bagaimanakah anda menggunakan mobile devices sebagai alat pembelajaran mandiri selama ini?

23. What experience do you have in using your mobile device(s) for any of your classroom activities? (If any)
    Sebutkan pengalaman yang anda miliki terkait penggunaan mobile device untuk menunjang kegiatan pembelajaran di kelas anda. (jika ada)
24. What kind of experience do you have in any course in which the instructor uses his/her mobile device as an instructional tool? If any, tell me your experience in these courses?
    Sebutkan pengalaman yang anda miliki dari semua kelas yang telah ditempuh dimana instruktur atau dosen menggunakan mobile device sebagai alat pengajaran di kelas anda. (jika ada)
25. What kind of experience do you have with any technology-oriented class which includes a discussion of mobile learning? (If any)
    Sebutkan pengalaman yang anda miliki dari kelas teknologi pembelajaran yang mencakup diskusi menggunakan mobile device. (jika ada)
26. What kind of experience do you have with mobile devices for classroom instruction during your internship in school? (If any)
    Sebutkan pengalaman yang anda miliki terkait penggunaan mobile device untuk pengajaran di kelas selama kegiatan magang. (jika ada)

Appendix C: Informed Consent

UNIVERSITY OF ARKANSAS
CONSENT FORM FOR RESEARCH PARTICIPATION

Study Title: Mobile-Assisted Language Learning in Teacher Education: Investigating Beliefs and Attitudes of Indonesian EFL Pre-Service Teachers

Principal Investigator:
Dodi Siraj Muamar Zain
Department of Curriculum and Instruction
College of Education and Health Professions
University of Arkansas
Fayetteville, AR 72701
dodizain@uark.edu

Iroshi (Ro) Windwalker, CIP
IRB Coordinator
Office of Research Compliance
109 MLKG Building
University of Arkansas
Fayetteville, AR 72701
irb@uark.edu

Faculty Advisor:
Freddie Elizabeth Alexander Bowles, Ph.D.
Department of Curriculum and Instruction
College of Education and Health Professions
University of Arkansas,
306 Peabody Hall,
Fayetteville, AR 72701
fbowles@uark.edu

Compliance Contact Person:

Research Statement:

I am a student at the University of Arkansas, in the College of Education and Health Profession. I am planning to conduct a research study, which I invite you to take part in. This form has important information about the reason for doing this study, what I will ask you to do if you decide to be in this study, and the way I would like to use information about you if you choose to be in the study.

It is necessary for you to know the objectives and the scope of this study before deciding to take part. All necessary information dealing with your participation is explained in this form Please read the following information carefully. Should you have any questions or need clarification for the provided information, you can ask directly through phone or email as provided on this form. When you are sure that you have already obtained all the required information, you can decide to participate or not participate in this study. You will be given a copy of this form.

Why are you doing this study?

You are being asked to participate in a study that examines your beliefs and attitudes toward the application of Mobile Assisted Language Learning (MALL). MALL is an approach harnessing mobile technologies such as smartphones and tablets to accommodate spontaneous and personal language learning.

This study is conducted to achieve the following objectives;

1) This study describes beliefs and attitudes of EFL preservice teachers toward MALL during their teacher preparation program. For this purpose, this study elicits what kind of mobile devices were used and how they were employed as supporting instructional tools.
2) This study is conducted to understand the connection between beliefs and attitudes toward MALL from multidimensional perspectives.
3) This study will elicit the influencing factors that determine preservice teacher's beliefs and attitudes toward MALL and formulate possible implications to improve the application of this approach in future instructional practices.

What will I do if I choose to be in this study?

You will be asked to answer some questions in an interview with the principal investigator.

The questions you need to answer will be about

1) Your understanding of Mobile-Assisted Language Learning,
2) Your experiences in using mobile devices for learning or instructional objectives,
3) Your beliefs of using mobile devices for learning or instructional objectives,
4) Your attitudes toward the use of mobile devices for learning or instructional objectives and,

For the interview, you will not be asked to

1) Reveal personal details if you prefer to remain private
2) Remain in the study if you choose to stop your participation

Study time: Study participation will take approximately 30-45 minutes for a one-session interview.

Study location: All study procedures will be conducted through the online platform ZOOM.

The interviews will be recorded to make sure all the provided information can be thoroughly saved for analysis. The video files will be kept in hard disk storage and they will only be accessed by the researcher (principal investigator). If you prefer not to be video-recorded, I will take notes instead.

I may quote your remarks in presentations or articles resulting from this work. A pseudonym will be used to protect your identity unless you specifically request that you be identified by your true name.

What are the possible risks or discomforts?

Your participation in this study does not involve any physical or emotional risk to you beyond that of everyday life. As with all research, there is a chance that the confidentiality of the information we collect from you could be breached –I will take steps to minimize this risk, as discussed in more detail below in this form.

What are the possible benefits for me or others?

You are likely not to obtain any direct benefit from being in this research study. However, this study will help to explain pre-service teachers' beliefs and attitudes which can be a reference for future studies or instructional practices. Additionally, the results may be a

consideration to develop the curriculum or design instructional activities for the teacher education program.

How will you protect the information you collect about me, and how will that information be shared?

Your study data will be handled confidentially to the extent allowed by law and University policy. To minimize the risks to the confidentiality, I will anonymize all identifying information comprising names and information of any related institutions. Interview transcripts will be securely stored, and password protected. The project's research records may be reviewed by The University of Arkansas' agency responsible for regulatory and research oversight.

The results of this study may be used in publications and presentations. However, this study will not release identifiable results of the study to anyone other than individuals working on the project without your written consent unless required by law. The data I collect from you might be shared for use in future studies or with other researchers – if I share the data that I collect about you, I will remove any information that could identify you before I share it.

Financial Information

Participation in this study will involve no cost to you. Your participation is on a voluntary basis meaning that you will not be paid for participating in this study.

What are my rights as a research participant?

During the interview, you may refuse to answer any question you do not want to answer. If at any time and for any reason, you have can cancel the appointment for the interview by contacting the researcher prior to the interview. You can take a break, stop and continue at a later date, reschedule, or stop altogether. You may withdraw from this study at any time, and you will not be penalized in any way for deciding to stop participation. If you decide to withdraw from this study, I will ask you if the information already collected from you can be used.

Whom can I contact if I have questions or concerns about this research study?

If you have questions, you are free to ask them now. If you have questions later, you may contact Dodi Zain, the researcher, at dodizain@uark.edu or Freddie Bowles, Ph.D., Faculty Advisor at fbowles@uark.edu

If you have questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's IRB Compliance Coordinator, at irb@uark.edu.

Consent

I have read this form and the objectives of the study have been explained to me. I have been given the opportunity to ask questions and my questions have been answered. I have also been given contact information in case I have additional questions to ask. I agree to participate in this study as described above and I will receive a copy of this consent form.

Consent for use of contact information to be contacted about participation in other studies
The initial one of the following to indicate your choice:
_____ (initial) I agree to allow the researchers to use my contact information collected during this study to contact me about participating in future research studies.
_____ (initial) I do not agree to allow the researchers to use my contact information collected during this study to contact me about participating in future research studies.

_____
Participant's Name (printed)

_____ _____
Participant's Signature Date

Appendix D: IRB Approval

UNIVERSITY OF ARKANSAS

To:	Dodi Siraj Muamar Zain
From:	Justin R Chimka, Chair IRB Expedited Review
Date:	09/21/2021
Action:	**Expedited Approval**
Action Date:	09/21/2021
Protocol #:	2107347093
Study Title:	Preservice Teacher's Beliefs and Attitudes towards Mobile Assisted Language Learning
Expiration Date:	08/26/2022
Last Approval Date:	

The above-referenced protocol has been approved following expedited review by the IRB Committee that oversees research with human subjects.

If the research involves collaboration with another institution then the research cannot commence until the Committee receives written notification of approval from the collaborating institution's IRB.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date.

Protocols are approved for a maximum period of one year. You may not continue any research activity beyond the expiration date without Committee approval. Please submit continuation requests early enough to allow sufficient time for review. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study closure.

Adverse Events: Any serious or unexpected adverse event must be reported to the IRB Committee within 48 hours. All other adverse events should be reported within 10 working days.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, study personnel, or number of participants, please submit an amendment to the IRB. All changes must be approved by the IRB Committee before they can be initiated.

You must maintain a research file for at least 3 years after completion of the study. This file should include all correspondence with the IRB Committee, original signed consent forms, and study data.

cc: Freddie A Bowles, Investigator