EFL TEACHERS' TECHNOLOGY SELF-EFFICACY AND INTEGRATION: CASE OF NEW GENERATION SCHOOLS IN CAMBODIA

SABAN BON

DOCTOR OF PHILOSOPHY

IN

ENGLISH FOR PROFESSIONAL DEVELOPMENT

SCHOOL OF LIBERAL ARTS

MAE FAH LUANG UNIVERSITY

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ABSTRACT

Technology plays a paramount role in teaching and learning English as a Foreign Language (EFL), so it has become a must-have for EFL teachers to integrate it into their classroom instructions. A wealth of research has revealed that teachers' Technology Self-Efficacy (TSE) is a good predictor of Technology Integration (TI). In addition, the factors affecting teachers' TSE and TI can be interrelated. Therefore, identifying the factors affecting both constructs is at play in helping teachers to successfully integrate technology into their classroom instructions. Moreover, the effective training and Professional Learning Communities (PLCs) concerning TI can help teachers become tech-savvy which is of significance in enhancing teachers' TSE and TI. This study thus attempted to identify the factors affecting EFL New Generation School (NGS) teachers' TSE and TI and the roles of training and PLCs in determining EFL teachers' TSE and TI. The survey questionnaires, interviews, and classroom observation were utilized to collect the data. The participants included all EFL teachers (N=15) teaching an English subject at two NGSs in Cambodia, 354 students from 15 different classes, and one ICT Team Leader.

The study yielded three factors: teacher-related factors, student-related factors, and school-related factors. Teacher-related factors comprised their technological knowledge and experience with TI, perceptions of technology, and expertise in technology-integrated

classroom management. Student-related factors included students' technological knowledge, possessing devices, feedback, and engagement/interest. School-related factors include technological resources, time support, internet connection/frequent electricity outages, and feedback from the school principal. Moreover, students' family-related factors including household duties assigned by their parents and their parents' restriction on device use could determine EFL teachers' TSE and TI.

The current study also revealed that PD training partly played in helping EFL teachers to integrate technology into their EFL classrooms. EFL teachers suggested effective training for TI in their EFL classes encompass several aspects, namely being the subject focus, offering hands-on experience, providing them the opportunities to learn various types of new technology, and allocating sufficient time in the training. Moreover, they reported that PLCs in their schools played a crucial role in helping them learn technology. That said, they expressed the lack of opportunities for discussions on technology integration due to other additional administrative duties imposed by their respective schools. Accordingly, for effective PLCs, they recommended more allocated time for discussing and sharing the technology integration in addition to the active involvement of all members in sharing and assisting one another.

The study would offer a bird's-eye view of what contributes to the development of EFL teachers' TSE, resulting in the improvement of TI in their English classes. In addition, the study suggested improving training programs and providing necessary support for effective PLCs where teachers could learn and share TI in their EFL classrooms.

Keywords: Cambodian Education System, New Generation School, EFL Teachers, Technology, Technology Integration, Self-Efficacy, Technology Self-Efficacy, Professional Development, Training, Professional Learning Communities

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ABBREVIATIONS AND SYMBOLS

EFL	English as a Foreign Language
ELS	Enhancing Language and Skills
ICT	Information and Communication Technology
MoEYS	Ministry of Education, Youth and Sport
NGS	New Generation School
PD	Professional Development
PIA	Promoting Intercultural Awareness
PLCs	Professional Learning Communities
PLE	Promoting Learning Engagement
RGC	Royal Government of Cambodia
TI	Technology Integration
TPACK	Technological Pedagogical Content Knowledge
TPD	Teacher Professional Development
TSE	Technology Self-Efficacy

CHAPTER 1

INTRODUCTION

1.1 The Rationale of the Study

In the contemporary era of globalization, technology is a buzzing term to almost all people, especially researchers, and it has become increasingly momentous in almost all fields. There is no exception in the sphere of teaching and learning the English language because of the predominant advantages technology provides to the field. Briefly put, technology has the potential to enhance teaching and learning English as a Foreign Language (ELF). In this sense, the integration of technology is integral to the English language education setting. The term 'technology' can refer to scientific inventions including social media (e.g. Facebook, Instagram, Telegrams, Twitter, TikTok, WhatsApp), digital platforms (e.g. Zoom, Google Meet, Microsoft Team), digital devices (e.g. computers, tablets, smartphones), and so on.

A body of literature (Dudeney & Hockly, 2007; Rathore & Singhvi, 2013; Al-mahrooqi, 2014; Altun, 2015; Richards, 2015; Izadpanah & Alavi, 2016; Skorczynska et al., 2016; Önalan & Kurt, 2020; Paudel, 2021; Basar & Sahin, 2022) has acknowledged that technologies could facilitate the teachers' teaching and students' learning. Students are digital natives (Al-mahrooqi, 2014; Basar & Şahin, 2022), so teachers can easily use technology to facilitate their teaching. Teachers can also use English language lessons on the Internet to teach students (Rathore & Singhvi, 2013). Students can develop their communication skills by using online dictionaries and pronouncing dictionaries and learning English by playing language games, watching videos, listening to audio recordings, reading text on the internet, and using other online language learning software (Rathore & Singhvi, 2013). Likewise, technology provides teachers with many options for teaching the four skills of language through various resources such as YouTube, Apps, and other free websites on the Internet. Technologies

such as computers, the internet, smart boards, mobile phones, video games, and music players are used in the target language learning process to increase students' motivation and language knowledge (Altun, 2015). In addition, technology could introduce students to the cultures of the people and countries where they are learning a foreign language, facilitating communicative learning (Paudel, 2021). That is essential for intercultural communication nowadays. The use of computer technology in language instruction offers a student-centered environment (Ministry of Education, Youth and Sport [MoEYS], 2004; Çakici, 2017; Basar & Şahin, 2022). In addition to this, the integration of technology would also help students to be independent learners. When students experience using digital apps introduced in class, students can learn the English language themselves when they are off the class.

Due to the fact that technology offers numerous advantages to teaching and learning, the Royal Government of Cambodia (RGC) through MoEYS launched many educational policies, which also included the introduction of technology in education as one of the major agendas in the policies aiming to promote Technology Integration (TI) in teaching and learning. MoEYS (2004) inaugurated Policy and Strategies on Information and Communication Technology (ICT) in Education in Cambodia. The policy aimed to introduce ICT as a tool for teaching and learning other subjects and as one subject itself, to improve the quality of education, particularly at the secondary education level. Master Plan for ICT in Education 2009-2013 has been launched to make better use of ICT to improve the effectiveness of education at all levels and to produce a technological and critical-thinking workforce (MoEYS, 2010b). MoEYS (2019a), regarding the reform in secondary education, has concentrated on teaching and learning a foreign language alongside ICT in its Education Strategic Plan 2019-2023. Likewise, Cambodia Secondary Education Blueprint 2030 has embraced integrating technology in teaching and learning in all secondary school networks and New Generation School (NGS) type as one of the priorities in improving education quality (MoEYS, 2021).

In 2015, RGC through MoEYS inaugurated NGS as a new reform school program. It aimed to improve students' cognitive competencies in STEM (Science, Technology, Engineering, and Mathematics), ICT, and critical thinking in light of the rapidly developing global technology sector (Donaher & Wu, 2020). MoEYS (2019b)

launched New Generation School Operational Policy Guidelines. The policy has included the role of technology in teaching and learning at NGSs as one of the main agendas. As stated in the policy, technology is the key component in teaching and learning in NGSs. In this regard, the teachers at NGS are strongly encouraged to integrate technology into their teaching. According to MoEYS (2019b), NGS is an autonomous school, "which receives high investment linked to new standards of accountability and governance as well as professional standards for 21st Century learning" (p. 1). Thus, it is anticipated that NGS "will use their operational autonomy to promote innovation" (MoEYS, 2019b, p. 6), and technology in education, such as m-Learning, software-driven assessment, and learning, etc., is one form of innovation. The policy has also stated that the use of technology that not only provides access to hardware but also new educational software (e.g. Literatu, 3D Classroom, and so on) will improve teaching, learning, and assessment. Every teacher working for NGS schools must own a laptop to improve educational services such as computerized lesson planning, multimedia presentations in the classroom, online research, and software-driven learning and assessment, among other things (MoEYS, 2019b). However, most teachers may use technology as a direct substitute for traditional teaching methods or instruments. They use digital equipment, software, or internet resources to complete jobs that were once done manually or using traditional materials. They might choose digital textbooks over physical ones, display lessons on a whiteboard instead of using chalk, or utilize online quizzes instead of paper-based assessments.

In addition, making technological resources available and accessible in schools may be relatively easy, but making teachers use and integrate these resources may be a more formidable obstacle. That is, even though technology provides the predominant advantages to education, teachers may not integrate it into their teaching. There exist additional challenges that hinder teachers from utilizing these available resources. From the different contexts, a body of literature indicated various factors that obstruct most teachers from integrating the technologies in their classes. For instance, teachers lack pedagogical skills to make use of technology (Vrasidas & Glass, 2005), time, and resources (Chun et al., 2016; Raja & Nagasubramani, 2018; Regan et al., 2019; Gonzalez-DeHass et al., 2022) and teachers' characteristics and attitude (Önalan & Kurt, 2020). According to Almalki (2020), most studies found that the three common

factors including teachers' age, level of technical competency, and perception of technology could affect TI. The other factors are the learners' literacy and interests in technology, and the academic culture of the institution (Chun et al., 2016). A restricted curriculum, stifling the use of technology in practices aligned with their pedagogical practices (Ruggiero & Mong, 2015) or school cultures (Önalan & Kurt, 2020) is another factor.

It is also commonly acknowledged that teachers need effective Professional Development (PD) which plays a crucial role in determining their' TSE and TI. The lack of PD could negatively influence TI (Amar & Eleyan, 2022; Mafuraga & Moremi, 2017). PD is provided, but ineffective (Potter & Rockinson-Szapkiw, 2012; Rathore & Singhvi, 2013). Effective PD involves leading to changes in teacher practices and better outcomes for students (Darling-Hammond et al., 2017). Moreover, the two PD models including training and Professional Learning Communities (PLCs) are of significance in enhancing teachers' TSE and TI. For technology to be used effectively, schools must provide the necessary training to teachers so that they can make the best use of technology in language instruction (Richards, 2015). The necessary training for the teachers must include not only how to use the technology, but also how to make use of it. Similarly, PLCs which refer to the groups of teachers who work collaboratively to share their teaching experiences could also be another factor affecting TI, as, through PLCs, teachers could learn TI from their colleagues. The study found that PLCs could be implemented to overcome the barriers that teachers would face when integrating technology into their classroom instruction (Thoma et al., 2017). In addition, PLCs could influence the teacher's beliefs and practices toward TI (Cheng, 2017). PD training and PLCs can also complement one another. The study found that EFL teachers rely on informal training methods like collaborative learning due to inadequate PD training to enable them to use technology (Alghasab et al., 2020). Comprehensive training would equip teachers with the essential knowledge and skills for integrating technology, which they might then disseminate to their colleagues via PLCs. However, other researchers (Anderson et al., 2011; Slutsky, 2016; Kent & Giles, 2017; Kwon et al., 2019; Beberman, 2020; Gomez, 2020; Šabić et al., 2022; Zhang & Fang, 2022; Hershkovitz et al., 2023) argued that teachers' self-efficacy is of significance for TI. The sense of self-efficacy could also reflect the capability to use technology (Slutsky, 2016).

Bandura (1993) also stated that individuals' self-efficacy is the predictor of their behaviors. Likewise, the existing studies also revealed that teachers' Technology Self-Efficacy (TSE) predicted TI (Lee & Tsai, 2010; Anderson et al., 2011; Kwon et al., 2019; Li et al., 2019; Menabò et al., 2021). In this scenario, factors affecting teachers' TSE and TI could be interrelated. Technological knowledge and skills could influence TI and teachers would have a strong sense of TSE when having such knowledge and skills. The knowledge and skills can be acquired through PD training and PLCs. Therefore, identifying the factors affecting both teachers' TSE and TI would be insights into helping teachers integrate technology into their EFL classes

To sum up, the pressing challenges concerning TI need to be addressed to help teachers integrate technology into their teaching. To begin with, teachers must be equipped with the knowledge and skills in using technology. Lawless and Pellegrino (2007) asserted that PD for teachers was a key part of the effective TI and many scholars (Blanchard et al., 2016; Slutsky, 2016; Raja & Nagasubramani, 2018; Beberman, 2020; Gomez, 2020) claimed that technological knowledge and skills could be developed through PD. PD includes various models, two of which are training and PLCs. To be effective, the two models must meet teachers' needs and improve students' learning performance. Likewise, since PLCs also have significant roles in helping the teachers learn instructional technology, the school leaders must build up an environment where the teachers can learn TI from one another. All of these would also help teachers to have a high level of TSE. In addition, other various factors could also affect teachers' TSE and TI. Teachers must also feel supported to integrate technology successfully (Beberman, 2020). Besides technical support like providing on-campus training and opportunities to attend any off-campus event regarding technology use, the teachers also need supporting technological resources like adequate technological equipment and a well-developed technological infrastructure.

1.2 Statement of the Problem

Technology now permeates every aspect of daily life and affects most fields including the field of teaching and learning the English language. The numerous

advantages technology has offered to the field exert a strong influence on teachers to integrate it into their classroom instructions to enhance students' learning. A wealth of studies conducted in various contexts also revealed that various types of technology served different functions in facilitating teachers' teaching and improving students' learning (Li et al., 2019; Chiang, 2020; Hsieh & Huang, 2020; Lawrence et al., 2020; Saed et al., 2021; Sosas, 2021; Yang & Yeh, 2021; Ardi & Rianita, 2022; Kusuma, 2022; Rasti-Behbahani & Shahbazi, 2022; Toleuzhan et al., 2023; Kazu & Kuvvetli, 2023). Furthermore, since students are digital natives (Al-mahrooqi, 2014; Basar & Şahin, 2022), teaching English without technology is arduous for teachers to help them as English language learners reach the current goal of communication. With technology, students can develop the four skills as well as intercultural competence and TI would help students to become independent learners. When students are familiar with some digital apps introduced in class, students would also learn the English language themselves when they are at home. Therefore, TI must be implemented to effectively teach the English language, and it is crucial in today's world (Basar & Şahin, 2022).

However, many hurdles remain for teachers to use technology effectively and efficiently (Afari et al., 2023). The prior studies in various contexts revealed factors that could impede EFL teachers from integrating technology into their teaching (Chaaban & Ellili-Cherif, 2017; Mafuraga & Moremi, 2017; Almalki, 2020). For instance, the study conducted in Botswana (Mafuraga & Moremi, 2017) and the study conducted in Saudi Arabia revealed that technology literacy or technological knowledge is the factor influencing TI (Almalki, 2020). Likewise, in less developed countries like Cambodia, helping teachers integrate technology into their English classes can be challenging for both school leaders and policymakers. Nevertheless, Richardson et al. (2014) believed that less developed countries such as Cambodia could encourage the use of technology in teaching and learning in many ways. Identifying the barriers that impede teachers from integrating technology could be one of the best ways. Concerning this, the study found that, in the Cambodian context, the key barrier is exposure to computers and the Internet (Richardson et al., 2014).

In the context of NGS, MoEYS has strived its best to encourage teachers to embrace technology in their teaching through the improvement of school facilities and

infrastructures. As stated in NGS Operational Policy Guidelines, each NGS has 21st-century libraries with m-Learning facilities (like e-library services, educational software, tablet access, and so on.) and teaching and learning software programs (e.g., Literatu, 3D Classroom, SMAS, and so on). Yet, these could not guarantee TI; for various reasons, although many teachers are aware of the technology that is available to them for educational purposes, they are not taking advantage of the chance to incorporate such resources into their classrooms (Slutsky, 2016; Mitchell, 2021). The lack of teachers' technological knowledge acquired through PD training and PLCs can be a hindrance. The lack of such knowledge would impede the teachers from integrating technology into their teaching. According to the study by Chea et al. (2022) utilizing the TPACK (Technical Pedagogical Content Knowledge) instrument with 687 teachers at 43 secondary schools throughout Cambodia, most secondary school teachers in Cambodia have poor technological knowledge. In addition, their analysis reveals that instructors at resource schools in Cambodia are less willing to use technology in their lessons, and therefore they claimed that giving technological resources would not yield the intended outcomes. Other scholars (Barton & Dexter, 2020; Gomez, 2020) contended that TI was associated with TSE. Thus, elevating the level of teachers' TSE could increase effective TI (Barton & Dexter, 2020). The existing studies revealed that TSE was the predictor of TI (Anderson et al., 2011; Kwon et al., 2019; Li et al., 2019; Menabò et al., 2021). Besides, it has been accepted that technological knowledge, PD training, and PLCs alongside other factors could affect teachers' TSE leading to less or more frequent TI. In this sense, identifying all of these factors affecting EFL teachers' TSE could be the best way to inform the school leaders and policymakers on how to encourage the EFL teachers at NGS to integrate technology into their teaching.

Self-efficacy is the core theoretical framework for this study and it is grounded in Social Cognitive Theory proposed by Bandura (1977). Apropos of the factors affecting an individual's self-efficacy, Bandura (1977) provided four general sources of self-efficacy including master experience (performance accomplishment), vicarious experience, verbal persuasion, and physiological and emotional arousal. Nevertheless, self-efficacy is a context-dependent phenomenon (Britner & Pajares, 2006; Henson, 2002; Alibakhshi et al., 2020) and thus Henson (2002) suggested that investigating the factors affecting it in a certain context be undoubtedly justified. In the same vein, high

self-efficacy in one area does not guarantee it in another (Kwon et al., 2019). In this sense, the factors affecting self-efficacy may vary depending on the specific settings to which individuals are exposed or the particular work domains in which they operate. Farah (2012) also suggested that it would be helpful to identify specific factors in a particular context. Specifically, the study investigating the factors affecting teachers' TSE in a specific subject like English per se remains scant. Based on the review of the literature, the factors affecting both constructs could be interrelated, and prior studies have yet to explore the factors affecting EFL teachers' TSE and TI in the context of NGSs, the selected schools. Thus, the current study intended to fill this gap by exploring the factors affecting EFL teachers' TSE and TI in teaching English subjects in two NGSs in Cambodia. That said, the factors reported by teachers may not reflect their actual teaching practice and thus identifying the factors affecting TI in real teaching and learning an English subject within these two schools would be crucial insights for helping teachers to incorporate technology into their EFL classes. Teachers' and students' perceptions of TI in their EFL classes could also be the determinants of teachers' TSE and TI. Teachers' perception of technology is how the teachers believe in the benefit of technology in teaching and learning; such belief could determine TI (Tilton & Hartnett, 2016; Önalan & Kurt, 2020). The student's perception of TI is another vital determinant, as it could affect the level of their engagement (Farah, 2012; Slutsky, 2016). Moreover, since training and PCLs could also be the factors affecting EFL teachers' TSE and TI, the study also investigated the role of these two variables in EFL teachers' TSE and TI.

1.3 Research Purpose and Objectives

The purpose of this research was to promote TI in EFL classrooms. This study set out to accomplish its overarching purpose by examining the following research objectives:

1.3.1 To identify the factors affecting EFL teachers' technology self-efficacy and integration.

1.3.2 To investigate if EFL teachers' and students' perceptions of technology could affect EFL teachers' technology self-efficacy and integration.

1.3.3 To investigate the similarities and differences regarding the identified factors based on the groups of teachers with different levels of technology self-efficacy.

1.3.4 To explore how the training and professional learning communities affect the level of TSE and authentic integration of technology.

1.4 Research Questions

The study is guided by the following research questions:

1.4.1 What factors affect EFL teachers' self-efficacy and technology integration?

1.4.2 In what ways, can EFL teachers' and students' perceptions affect teachers' TSE and TI?

1.4.3 What similarities and differences exist among the groups of EFL teachers with different levels of TSE?

1.4.4 In what ways can the identified factors be related to the training and professional learning communities EFL teachers previously experienced?

1.5 Scope and Limitations of the Study

The study was conducted at two secondary schools in Cambodia. These two schools are public schools that started implementing the NGS program in the same year. The NGS program is the new reform school with innovative instruction. In addition, the study was limited to the teachers who teach English subjects at the schools selected and they have to be at least one year of teaching experience in the NGS program. Finally, the purpose of the study was to identify the factors affecting EFL teachers' TSE and TI through survey questionnaires, interviews, document reviews, and classroom observation.

The result of this study may not intend to conclude all public schools across Cambodia. In addition, the result did not represent the teachers teaching the other

subjects at the same schools. Finally, the other available tools besides the mentioned ones were excluded from this study.

1.6 The Significance of the Study

The main purpose of this study was to identify the factors affecting EFL teachers' TSE and TI. In addition, the study intended to examine how teachers and students perceive their classes with TI. The result regarding teachers' perception would be an essential predictor of how often teachers utilize technology in their teaching. This would help the school leaders and administrators to build up teachers' positive perceptions of technology integration. The results regarding students' perception would be crucial for teachers to be aware of because effective teachers need to take students' interests into account before applying a particular tool or method because, according to Slutsky (2016), "effective teachers are in tune with their student's interests and values" (p. 27). The study also aimed to scrutinize how the identified factors varied among the groups of teachers with different levels of TSE. The results would provide the school leaders or school administrators with how to increase EFL teachers' TSE and enhance TI in teaching English subjects to enhance students' learning. Finally, the study also intended to investigate how the identified factors are related to the training and PLC the teachers experienced. Therefore, the results of this study would be helpful for school leaders and policymakers to develop a better framework for the effective training of technology to equip teachers with the necessary skills and knowledge in using technology. The results could also be the blueprint for school leaders and administrators to build up the school environment where teachers could learn and share TI with their respective classes.

1.7 Definition of Key Terms

1.7.1 Cambodian Public Secondary Schools refer to Cambodian schools that consist of three years each for lower secondary education (grades 7 to 9) and upper secondary education (grades 10 to 12) and are under the control and financed by

MoEYS (the Ministry of Education Youth and Sport), Cambodia. There are two national exams the students have to take to complete secondary education. The 9th-grade national exam is adopted to measure if the students complete low secondary education and can continue to upper secondary education. The 12th-grade national exam is adopted for students to sit to make sure they receive the high school certificate and pursue their higher education.

1.7.2 EFL (English as a Foreign Language) teachers refer to non-native English language teachers (Cambodian teachers) teaching an English subject to non-native English language learners (Cambodian students).

1.7.3 New Generation School (NGS) is the new education reform program launched by the Cambodian national government and MoEYS. NGS strives to encourage innovation in curricula, instructional practices, and resource utilization to improve learning outcomes and prepare students for the workforce of the twenty-first century (Donaher & Wu, 2020).

1.7.4 Technology refers to scientific inventions including social media (e.g. Facebook, Instagram, Telegrams, Twitter, TikTok, WhatsApp), digital platforms (e.g. Zoom, Google Meet, Microsoft Team), digital devices (e.g. computers, tablets, smartphones), and so on. Educational technology encompasses any tool, piece of equipment, or gadget, electrical or mechanical, that may be utilized to assist students in achieving certain learning objectives (Davies et al., 2008). However, several commonly utilized technologies in the field of education include desktop computers, laptops, handheld computers, as well as software and Internet-based tools (Hew & Brush, 2007).

1.7.5 Teachers' Professional Development (TPD) refers to teachers' engagement in various events or activities aimed at acquiring novel knowledge, skills, or strategies that enhance and expand upon their existing knowledge base. It involves the enhancement of teachers' competencies, knowledge, skills, and abilities that they currently use or will use in professional activities (Abdalina et al., 2022).

1.7.6 Technology Professional Development refers to the ongoing career development of knowledge related to how to integrate technology in teaching and learning that the individual gets by attending training seminars, conferences, workshops, and so forth.

1.7.7 Professional Learning Communities (PLCs) refer to a group of teachers in a learning environment where they can share ideas to improve their teaching and students' learning. In PLCs, teachers work together to support the pedagogical change to deal with the challenges and continually improve their teaching practice. PLCs place a strong emphasis on social, collaborative, and contextual learning that is embedded in instructors' everyday classroom activities (Feldman, 2020). Succinctly, PLCs allow their members to share and learn from each other, which is significant for effective teaching, and improving students' learning.

1.7.8 Self-efficacy refers to an individual's confidence level in his or her ability to perform a task. The task would refer to TI in the classroom (Beberman, 2020). The belief one's ability facilitates personal agency in managing one's circumstances, enabling the utilization of preferred skill sets proficiently and fruitfully manner (Miller, 2016). That is, this includes the capacity to effectively and productively utilize their preferred skill sets.

1.7.9 Teachers' Technology Self-Efficacy (TSE) refers to teachers' confidence in their abilities to integrate educational technologies such as teaching and learning software programs, school mobile apps, and other supporting materials into their pedagogical classroom. It can be broken down into different areas, such as online (or internet) self-efficacy, individual device (like a laptop or smartphone) self-efficacy, or classroom TI efficacy (Tilton & Hartnett, 2016). Teachers with higher levels of TSE could lead to higher-quality TI (Barton & Dexter, 2020).

1.7.10 Technology Integration (TI) is the use of various technological tools, such as desktop and laptop computers, smartphones, tablets, and other devices, both with and without internet access, to support teaching and learning activities. Succinctly, it refers to the incorporation and utilization of computer equipment, software, and other electronic devices within the educational setting (Davies & West, 2014).

CHAPTER 2

REVIEW OF LITERATURE

This chapter is comprised of the literature review, which, first, depicts the introduction to the chapter. Then, the chapter highlights the Cambodian general education system and New Generation Schools (NGSs). The chapter also provides an overview of English language education in Cambodia. Next, the chapter presents the literature reviews concerning technology and education, technology and Cambodian education, TI in language classrooms, teachers' self-efficacy, teachers' TSE and TI, factors affecting teachers' TSE, and factors affecting TI. Regarding the factors affecting teachers' TSE, this chapter includes reviews of teachers' PD models including training and PLCs, teachers' and students' perceptions, and other factors. Then, the chapter presents the previous studies regarding the factors affecting teachers' TSE and TI. Finally, the chapter presents the proposed research conceptual framework.

2.1 Cambodian General Education System and New Generation Schools (NGSs)

Cambodia's general education system consists of 12 years of education, divided into 6 years of primary education (Grades 1-6), 3 years of lower secondary education (Grades 7-9), and 3 years of upper secondary (Grades 10–12). Both public primary and secondary schools are run by the Cambodian royal government through MoEYS. Improving the education quality within general education has been a pressing concern for the royal government of Cambodia for decades. The poor level of education in Cambodia generally is a result of many interrelated causes such as poor teaching methods, private tutoring, and poor school administration (Chea & Chen, 2021). Therefore, the Cambodian government through MoEYS has implemented a new school reform called NGS that departs from the conventional school model as part of its drive

to declutter the bureaucratic administration (Chea & Chen, 2021). This new reform was introduced in 2015 (Donaher & Wu, 2020) and it is equivalent of Charter Schools in the United States. The goal of this new reform school program is to improve education quality in general education levels through transforming public schools (from primary to secondary levels) to become autonomous schools. MoEYS permits NGS to waive a number of laws, rules, and regulations that are applicable to regular public schools' curricula, school organizations, personnel management, teacher hiring and firing, and TPD (Bo, 2021). NGS employs a more cutting-edge curriculum and teachers are encouraged to use innovative instruction with the incorporation of instructional technology into their daily teaching. In 2023 which is the fifth year of implementing this new reform program, NGS operates at 11 school sites (7 secondary and 4 primary schools). Three school sites (secondary schools) are located in Phnom Penh and the other eight school sites are located in the provinces across the Kingdom of Cambodia. English is a significant foreign language subject which require students to take 4 hours a week. Unlike other public schools, NGS use English coursebook New Headway.

2.2 Overview of English Language Education in Cambodia

English has gained popularity among the majority of Cambodians since the arrival of the United Nations Transitional Authority in Cambodia (UNTAC) to sponsor the 1993 national election and Cambodia's membership in the Association of Southeast Asian Nations (ASEAN) in 1999.

English was officially introduced as a foreign language in secondary education in 1989 (Vira, 2002; Mao, 2015) with scant resources, including no curriculum, no textbooks, and few English teachers (Mao, 2015). Then, the presence of UNTAC to sponsor Cambodia's national election in 1993 also made English a more popular foreign language. In 1999, Cambodia became the 10^{th} member of ASEAN. Unlike other international organizations, ASEAN's only official language is English and this has provided Cambodia with a significant incentive to cultivate English-speaking personnel (Igawa, 2008). Since then, Cambodian people have been urged to study English because those who can do so would have a better chance of landing lucrative positions. English

has now taken center stage in secondary school policy discussions (e.g. MoEYS, 2014, 2015, 2019a). Foreign languages, especially English, are a topic for communication, study, work, critical thinking growth, and creativity in response to a changing society and the rapid advancement of science, and regional and worldwide technology (MoEYS, 2015). English alongside French has been introduced as a foreign language subject in Cambodia's secondary education including low secondary and upper secondary levels. Today, compared to other foreign languages such as Chinese, Japanese, Korean, and French presenting in Cambodia, English is still the most popular foreign language for most Cambodian people. At NGSs, English is one of the significant subjects (Bon & Chuaychoowong, 2023).

2.3 Technology and Education

Technology is a crucial tool for improving education quality. It is the modern teaching and learning tool that educators can use to help improve their teaching quality and student learning efficiency. Numerous scholars have also acknowledged the advantages of technology in education. Because of the diffusion of ICT, the role of technology in education is more important than ever (Budhwar, 2017; Birisci & Kul, 2019). The technology could enhance education quality (Hun et al., 2020) since it has provided numerous advantages for both teachers and students. Innovative software and technological tools provide revolutionary prospects for educational activities (Isikli & Sezer, 2022). In addition, TI provides chances to help students, boost engagement, and develop a crucial element of the reform of twenty-first-century teaching and learning (Cydis, 2015). Technology allows students to have quick access to knowledge and information. In other words, because of the advent of technology, knowledge transfer has become much easier, more convenient, and more effective. With digital devices such as smartphones, tablets, and laptops and an internet connection, students can learn at any time and from anywhere.

Moreover, technology is a crucial component of effective teaching (Mishra & Koehler, 2006). It helps improve learning efficiency and teaching quality, expand access to resources, and improve management (Haddad & Draxler, 2005). The use of

technology can increase student motivation and participation (Budhwar, 2017; Mikusa, 2020), promote student engagement (Farah, 2012), and active learning (Uslu, 2018), support students with various learning styles, and improve teaching and learning efficiency (Asad et al., 2021). It allows the entire instructional process to shift from a passive to a collaborative and interactive environment (Kent & Giles, 2017; Raja & Nagasubramani, 2018). More importantly, TI is important for global education to help students become global citizens. Teachers are expected to integrate technology into their classes to prepare pupils to gain 21st-century skills (Tennant & Elizabeth, 2019; Hun et al., 2020) and prepare them for future employment (Tennant & Elizabeth, 2019). That is, it is regarded as a tool for delivering, bolstering, and strengthening educational innovations in line with the educational requirements of the information society (Asad et al., 2021). In addition, TI helps students to be ready to live in a technologically globalized world (Chun et al., 2016). TI will help students become familiar with the innovation since they will use it in the future (Asad et al., 2021). Students with a technology skill set can compete in and contribute to the global society they will soon enter (Mitchell, 2021). Overall, technology is a significant tool for today's education, and therefore TI in the classroom must be adopted to advance the overall learning environment as it could promote student engagement and participation and foster education quality through the development of students' abilities.

2.4 Technology and Cambodian Education

In Cambodian education, technology like ICT has played a vital role in education at all levels. This is particularly true, as its significance has been embedded in Cambodian education policies. According to MoEYS (2004), ICT includes computer technology, computer networks, email, and the Internet, as well as radio and television. Recently, it encompasses websites, applications, social media, and many other digital platforms. ICT is one of the significant subjects alongside other subjects (MoEYS, 2010a). It is "a subject of study about the use of information and communication equipment for further study, teaching, and daily lives" (MoEYS, 2015, p. 6). According to MoEYS (2010b), ICT has a vital role in education at all levels in terms of making

educational outcomes more relevant to the job market, changing educational content and delivery, and encouraging information literacy. ICT is provided for all teachers and students, particularly at the secondary level to be used to decrease the digital gap between Cambodian schools and the schools in neighboring countries, and it is used both as a tool in teaching and learning and as a subject by itself (MoEYS, 2004). The integration of ICT in secondary education would help students to acquire ICT technical skills which are significant for their future study and career (MoEYS, 2010b) which lead to promoting a culture of self-learning and lifelong learning (MoEYS, 2004) since if students can use technology, they can learn by themselves at anywhere and anytime.

Aforementioned, NGS program, the new reform school program, launched by MoEYS in 2015 intended to promote innovation in teaching and learning. Integrating technology in teaching and learning is one form of innovative instruction. In NGS, English is one of the significant subjects. It is taught and learned as a foreign language and students are required to take four hours a week for this foreign language subject. In addition, technology is a significant tool in teaching and learning at NGSs. The use of technology embraces "not only access to hardware but also the introduction of new educational software that will enhance teaching, learning, and assessment" (MoEYS, 2019b, p. 3). To encourage NGS teachers to adopt technology into their teaching, each teacher is provided with a laptop to support their teaching. In addition, MoEYS has invested a lot of money in improving school facilities and infrastructures. Each NGS has enough computer labs and NGS libraries known as 21st-century libraries with m-Learning facilities such as e-library services, educational software, tablet access, and so on. The teaching and learning software programs (e.g. Literatu, 3D Classroom, SMAS, and so on) and other school mobile apps (MoEYS, 2019b). With all of these improvements, teachers are expected to adopt technology in their teaching to improve students' learning.

2.5 Technology Integration (TI)

In recent years, there has been a rise in the number of studies focusing on TI in education settings. For some scholars, TI means and is studied in terms of how teachers

use computers in the classroom, and for others, it means and is studied in terms of how teachers use technology to do known tasks more reliably and effectively, and how this use may be changing these tasks (Summak et al., 2010). TI is the process of innovation dissemination that starts with knowledge acquisition and ends with attaining high standards of technology utilization (Lu et al., 2023). To put it in another way, the concept of TI in educational settings encompasses the utilization of various technological tools, including personal computers, laptops, smartphones, tablets, and other devices, both with and without internet connectivity, to facilitate learning and assessment activities (Sharma & Nazir, 2021). Likewise, it can be described as the incorporation and utilization of computer equipment, software, and other electronic devices within the educational setting (Davies et al., 2008; Davies, 2011; Davies & West, 2014). Hsu (2016) defined TI as "the use of hardware such as laptops, scanners, smart boards, document cameras, digital cameras, digital camcorders, and handheld computers, as well as related software and the Internet, in classrooms for enhancing learning" (p. 31). The process of integrating technology is not solely focused on the technological aspect but rather emphasizes the significance of content and the implementation of effective instructional practices (Summak et al., 2010). Its focus must be on curriculum and learning. According to Davies and West (2014), TI refers to the successful utilization of educational technology to achieve desired learning objectives. When technology is successfully incorporated, it can offer students engaging opportunities to discover and utilize up-to-date information, as well as apply their academic skills to solve real-world problems (Summak et al., 2010). To sum up, TI is the use of different tech tools, like desktop and laptop computers, smartphones, tablets, and other gadgets, with or without an internet connection, to enhance teachers' teaching and students' learning.

Apropos of TI, Puentedura (2006) introduced the Substitution Augmentation Modification Redefinition (SAMR) model. The SAMR model was developed to explain the extent of technology integration in educational settings (Boonmoh & Kulavichian, 2023). The SAMR model, depicted as a ladder, provides a four-level framework for technology integration in K-12 education (Kimmons & Hall, 2016). At the lowest level of TI, the *substitution* stage, technology functions as an exact instrument substitute, with no functional change. Examples of technology use at the

substitution level include utilizing Microsoft Word in place of paper, reading texts online rather than in physical books, and employing PowerPoint slides for presenting learning materials as a substitute for whiteboard presentations (Boonmoh & Kulavichian, 2023). At the *augmentation* level, technology is exchanged, resulting in a beneficial alteration in the function of the task or tool (Kimmons & Hall, 2016). At the *modification* level, technology starts to change the way tasks are carried out, leading to a transformation in the learning process (Boonmoh & Kulavichian, 2023). During the *modification* step, the learning activity is improved and changed. Redefinition is the last and most advanced level of TI. At this point, technological advancements make possible the development of new tasks that were previously impossible.

2.6 Technology Integration (TI) in Language Classroom

The advent of technology in teaching and learning English has resulted in substantial shifts in how teachers teach and has become a significant aspect of language education. In this respect, teaching should not be only the use of textbooks anymore. To put it in another way, where technology is available and accessible, incorporating it into instructional methods is a core practice in teaching EFL (Sosas, 2021). Some technologies that EFL teachers are using in their teaching have been employed in EFL education since the 20th century. According to Dudeney and Hockly (2007), technologies such as tape recorders, language laboratories, and video have been employed in language classrooms since the 1960s and 1970s. They added that, in the early 1980s, computer-based materials for language education, known as CALL (Computer Assisted Language Learning), required students to respond to stimuli on a computer screen and complete tasks like filling in gaps in texts, matching sentence halves, and performing multiple-choice activities, became available. In the 1990s, the term TELL (Technology Enhanced Language Learning) was coined in response to the expanding capabilities of the Internet and communications technology (Dudeney & Hockly, 2007). Now, there are modern technologies such as digital apps, online platforms, e-books, podcasts, YouTube, and many other websites that are available and useful teaching and learning sources for EFL teachers and students to access.

The body of literature revealed TI was significant in language classes as it could enhance teaching and learning. It has also been accepted that different types of technology serve different functions in developing students' language areas. To begin with, on the Internet, students can practice grammar rules and vocabulary (Rathore & Singhvi, 2013). The utilization of instructional technology, particularly the World Wide Web, has provided English language educators and learners with a multitude of benefits, opportunities, and extensive resources to enhance language instruction and acquisition (Noori, 2019). Moreover, the use of technology in teaching and learning English would meet the goal of EFL learners who learn the language to communicate effectively, which is significant for today's world (Basar & Şahin, 2022). That is, it could help EFL teachers develop their students' intercultural competence (Zhang & Zhou, 2023), another important skill that EFL students need in the contemporary world of globalization, mobility, and migration (Bon, 2022). Furthermore, among various advantages, technology has the potential to enhance the significance of lessons and offer students authentic learning experiences. Cennamo et al. (2009) acknowledged that technology could enhance the clarity of intricate processes by employing visual aids and presenting multiple instances through online simulations or animations, images or photographs sourced from websites or CDs, as well as graphics or data tables. The utilization of YouTube, an internet-based video-sharing platform, is experiencing a surge in popularity as an instructional resource (Cennamo et al., 2009). Students can improve their language skills by using various sources of videos available. BBC and VOA news is another source of language learning in which, EFL students can develop their language competence.

A wealth of research in various contexts also revealed that different types of technology provided different functions that EFL could integrate to improve EFL students' learning. The other study from Indonesian teachers' perspectives found that integrating technology into EFL classes provided various advantages such as allowing students to practice online quizzes or tests, improving the speed of answering questions, developing the four macro skills, prompting collaboration and independent learning and so on (Rintaningrum, 2023). Another study indicated that students enjoyed using YouTube to improve their English skills, and it was found that the most popular videos on YouTube inspired and encouraged students (Toleuzhan et al., 2023). The study also

revealed that Learning English Listening and Speaking BBC/ VOA News provided students with access to a vast library of recently updated podcasts from the BBC and VOA, both online and offline (Abdi & Makiabadi, 2019). Blogging was also found to be important in developing students' language skills. In addition, students were found to be able to improve their English writing skills by blogging, and they were able to create an interactive learning environment through blogging, where they shared their experiences and viewpoints and learned from one another (Alenezi, 2022). The study by Chiang (2020) discovered that Storybird-mediated digital storytelling improves students' digital literacy in English and boosts their confidence as writers of English. Another study by Sosas (2021) showed that using technologies like video conferencing, email correspondence, and social media interaction could enhance students' speaking skills. Moreover, the studies suggested teachers implement digital games such as Kahoot!, Quizlet, and Quizzizz to improve students' learning and promote learning engagement. The integration of such digital games into language learning and teaching has yielded a plethora of potential solutions for enhancing learning processes and results (Toleuzhan et al., 2023). Kahoot! was found to help students learn EFL grammar in six different ways: by encouraging them to set goals, by helping them focus more on the tasks at hand, by allowing them to experience playful learning activities, by encouraging them to work together with their peers, and by satisfying their need for reward and a sense of competition (Ardi & Rianita, 2022). Aprilani and Suryaman (2021) conducted a study to investigate if Quizlet could enhance students' learning of English vocabulary. The results showed that it was effective and could motivate students to learn English vocabulary. Additionally, the common devices such as Smartphones that students possess also serve crucial functions in facilitating teaching and learning. The utilization of portable digital devices outside of the classroom setting has proven to be advantageous, owing to their adaptability and efficacy in facilitating learning at any location and time, and the integration of these devices into the educational curriculum has the potential to enhance the learning experience (Ningsih et al., 2022). The other study hereof showed that TI with the use of different technological devices could enhance English language learning. Ibrahim and Kadiri (2018) for instance found that the use of smartphones could promote cooperative and interactive

learning by enhancing students' ability to develop their knowledge with authentic English.

In conclusion, there is no denying the importance of technology in today's classrooms for both teaching and learning English. In light of the significance of technology in the realm of English language education, it is recommended that EFL instructors incorporate technological tools into their pedagogical practices to optimize their students' learning outcomes.

2.7 Teachers' Self-Efficacy

Self-efficacy is embedded in Alberta Bandura's social cognitive theory (Bandura, 1977). It is the notion that knowledge construction can be influenced by three distinct elements: personal, behavioral, and environmental factors (Bandura, 1977; Miller, 2016). The concept of self-efficacy can be described as an individual's belief in the ability of their actions to produce desired outcomes (Sharma & Nazir, 2021). It is founded upon an individual's perception of their ability to effectively perform tasks or achieve desired outcomes (Şen & Yildiz Durak, 2022). Self-efficacy refers to a belief, but not skills in the capability to do work in various job positions (Safari et al., 2020). Therefore, teachers' self-efficacy is the belief that teachers embrace the competencies and skills they have to attain a particular goal (Bandura, 1977; Skaalvik & Skaalvik, 2007) and to support learning in different-task domains and context-specific cognitive, metacognitive, affective, and social ways (Wyatt, 2016). Such beliefs can be seen as interacting with other kinds of self-beliefs, including growth and fixed mindsets (Dweck, 2014), as highlighted by Wyatt (2016), and can be conceptualized as operating within a broader motivational framework. Self-efficacy belief is a quality expected of teachers (Tschannen-Moran & Hoy, 2001). According to Artino (2012), self-efficacy is not the same as a general sense of confidence in one's competence, but it depends on the task and the setting. Likewise, for Saville and Foster (2021), self-efficacy is domain-specific, which means that a person can have high self-efficacy for some tasks while having poor self-efficacy for others. Accordingly, Artino (2012) elucidated that one developed self-efficacy beliefs about specific goals, like being able to correctly judge a

patient's heart sounds. In the education sphere, some scholars defined self-efficacy as the individuals' confidence in their competence in performing a specific task (e.g. Tschannen-Moran & Hoy, 2001; Christensen & Knezek, 2017; Mehmood, 2019; Hoang & Wyatt, 2021).

Teachers' self-efficacy has been acknowledged to hold great potential in influencing their teaching practice. The level of self-efficacy exhibited by an individual is positively associated with the achievement of desired outcomes (Sharma & Nazir, 2021). Self-efficacy makes teachers more adaptable to classroom challenges and more willing to try new methods (Mehmood, 2019). Tschannen-Moran and Hoy (2001) proposed three dimensions of teachers' self-efficacy, namely self-efficacy in *student engagement*, self-efficacy in *instructional strategies*, and self-efficacy in *classroom management*. Self-efficacy in *student engagement* is the teacher's confidence in motivating and engaging students. Self-efficacy in *instructional strategies* refers to teachers' confidence in utilizing a variety of assessment strategies and in dealing with difficult questions from students. Finally, self-efficacy in *classroom management* refers to the teacher's confidence in their ability to control disruptive behavior, to get the student to follow classroom rules. Various definitions and acknowledgements can be converged in the conclusion that teachers' self-efficacy refers to teachers' confidence in their teaching ability, which can influence the teaching and the students learning.

2.8 Teachers' Technology Self-Efficacy (TSE)

There have been some debates on the concept of teachers' TSE. It is a teacher's belief in his or her ability to integrate technology into classroom lessons (Gomez et al., 2022; Gomez, 2020). Teachers' overall sense of efficacy towards teaching may differ from their perceived efficacy in utilizing technology within the classroom setting. That is to say, teachers with a high level of self-efficacy in teaching their subject may not exhibit a high level of TSE. However, a lot of research on TSE has commonly referred to this construct as individuals' confidence in their ability to use technology (Pfitzner-Eden, 2016; Christensen & Knezek, 2017; Lailiyah & Cahyono, 2017; Kwon et al., 2019; Gomez, 2020; Gao et al., 2022; Şen & Yildiz Durak, 2022; Hershkovitz et al.,

2023). Therefore, in the teaching and learning EFL milieu, teachers' TSE can be defined as the EFL teacher's confidence in his or her ability to execute technology in teaching English. Teachers' TSE has been acknowledged that it is of significance in TI.

2.9 Teachers' Technology Self-Efficacy (TSE) and Technology Integration (TI)

The concept of teachers' TSE refers to their confidence in their ability to use technology and such confidence plays a crucial role in achieving successful TI. A body of literature has acknowledged that teachers' TSE holds great potential in determining TI (Beard, 2016; Slutsky, 2016; Kent & Giles, 2017; Lailiyah & Cahyono, 2017; Harrell & Bynum, 2018; Beberman, 2020; Gomez, 2020; Şen & Yildiz Durak, 2022). It is a key part of bringing technology into teaching (Şen & Yildiz Durak, 2022). Teachers' TSE has a big impact on how effectively teachers use technology in the classroom. Beard (2016) hereof noted that teachers entering today's classrooms must be confident in their ability to use ever-changing instructional technology. In addition, because self-efficacy is linked to one's beliefs about one's capabilities, if one does not feel capable of performing a task or fears failing at the task, one is less likely to attempt that task (Farah, 2012). Low self-efficacy has been identified as a barrier affecting EFL teachers' use of technology in their EFL instruction (Lailiyah & Cahyono, 2017). When teachers lack confidence in their ability to effectively utilize these tools, they tend to possess a diminished perception of their worth (Harrell & Bynum, 2018).

The research has revealed that teachers' TSE is the predictor of TI in actual classrooms (Lee & Tsai, 2010; Anderson et al., 2011; Kwon et al., 2019; Li et al., 2019; Menabò et al., 2021). For example, the study by Kwon et al. (2019) suggested that teachers might be hesitant to integrate technology into their classrooms if they lacked confidence in their ability to use technology although teachers' beliefs about the utility of mobile technology were strongly related to their use of technology. In other words, when teachers have a high level of self-efficacy in using technology, they tend to do their best to integrate it into their teaching. Another study showed that teachers' TSE influences their intention to adopt technology such as mobile devices in their teaching

(Xu & Zhu, 2020). To this end, for teachers to effectively integrate technology into classroom instruction, it is imperative to enhance their TSE, which refers to their confidence in their capacity to incorporate technology. Identifying the factors that influence TSE may prove to be the most efficacious strategy. However, another study indicated that although teachers might exhibit proficiency in utilizing technology for personal purposes, this level of confidence might not necessarily extend to their instructional practices within the classroom setting (Abbit & Klett, 2007). Accordingly, some other factors could also determine TI.

2.10 Factors Affecting Teachers' Technology Self-Efficacy (TSE) and Technology Integration (TI)

Teachers' TSE is associated with TI and therefore improving their self-efficacy could lead to more high-quality TI (Barton & Dexter, 2020). Accordingly, identifying the factors affecting EFL teachers' TSE and TI could encourage them to integrate technology into their pedagogical classroom. Regarding the factors affecting teachers' TSE, it is crucial to look at the four sources of self-efficacy (Bandura, 1977).

2.10.1 Sources of Self-Efficacy

Bandura (1977) proposed four main sources of efficacy including mastery experience, vicarious experience, verbal persuasion, and emotional arousal. The four sources of self-efficacy are summarized in Figure 2.1.

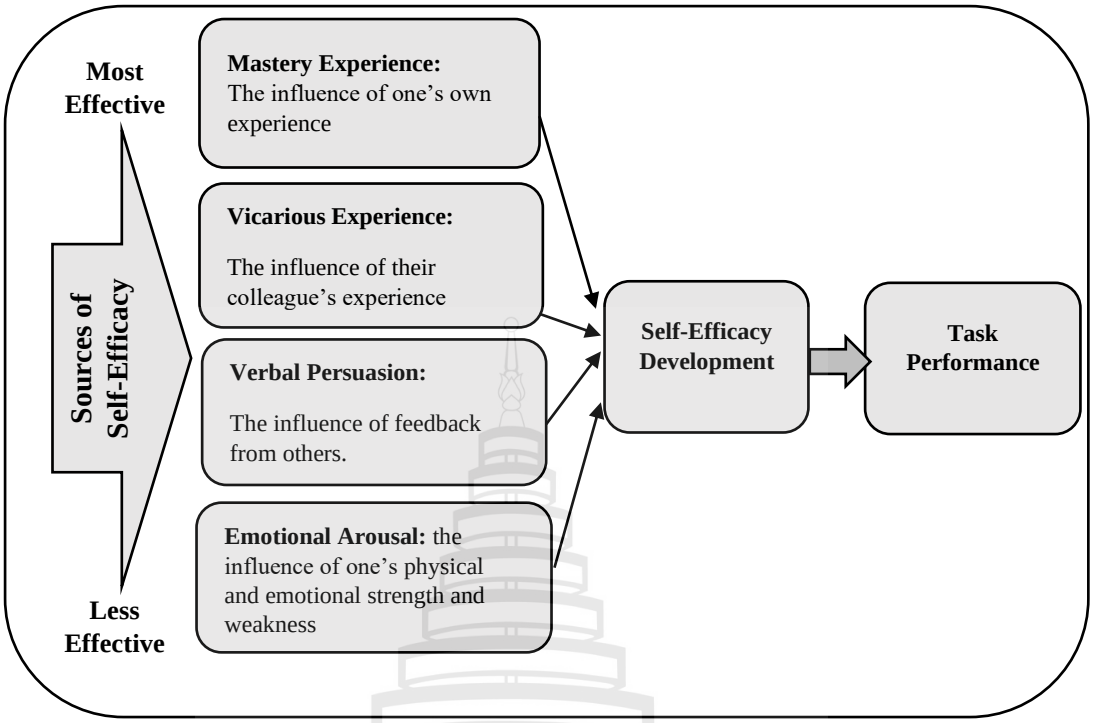
Mastery experience is the most effective way of creating a strong sense of efficacy (Artino, 2012; Bandura, 1997a). Previous successes or performance accomplishments build a robust belief in one's efficacy. Bandura (1997a, 1997b) elucidated that mastery experiences are the experiences of participants in given situations and influence self-efficacy by allowing participants to be exposed and desensitized to the performance of a task. Successful experiences can boost their self-efficacy, while failures can lower it (Phan & Locke, 2015). It is not necessary to acquire pre-made habits to develop a sense of efficacy through mastery experiences, but it entails developing the cognitive, behavioral, and self-regulatory skills necessary for formulating and carrying out sensible action plans to deal with constantly changing personal circumstances (Bandura, 1997a). Teachers often

evaluate their capacity to execute specific actions through accomplished mastery experiences (Chaaban & Ellili-Cherif, 2017). Meanwhile, Mitchell (2021) stated that mastery experience is correlated with repeated attempts at a task where successful outcomes have been attained through adversity, obstacles, and difficulties. What Mitchell (2021) has denoted is that when a task is completed quickly and effortlessly, self-efficacy will be high, but a subsequent failure can quickly reduce the sense of overall mastery. In this sense, the term "mastery experience" is the interpreted outcome of each teacher's prior success in performing a task and this could elevate the level of their self-efficacy. Regarding TI, mastery experience could refer to the performance accomplishment in using technology, which could strengthen or elevate the level of TSE and lead to TI.

The second influential way of creating and strengthening self-beliefs of efficacy is through the vicarious experiences provided by social models and this is live and symbolic modeling when participants observe the experience of others and make comparisons to their perceptions of their performance (Bandura, 1997a). That is, vicarious experiences give people the opportunity to learn from the successes and failures of others, which can have a positive impact on their sense of self-efficacy (Morris & Usher, 2011). Like mastery experience, successful vicarious experience is often used by educators as a criterion for evaluating an individual's ability to do a certain task (Chaaban & Ellili-Cherif, 2017). Kasalak and Dağyar (2020) agreed that teachers' self-efficacy beliefs might be affected by the indirect experience gained by observing colleagues, depending on whether the individual used as a model has experienced success or failure in a specific situation. Regarding this, Mitchell (2021) clarified that when their colleagues fail to complete a task despite great effort, the belief that the task can be completed is diminished. However, according to Bandura (1997a), "the impact of modeling on beliefs of personal efficacy is strongly influenced by perceived similarity to the models" (p. 3). In other words, when people perceive the models to be substantially different from themselves, the model's behavior and the results it creates have little influence on their perceptions of personal efficacy (Bandura, 1997a). Teachers' TSE could encompass vicarious experiences, wherein teachers observe their colleagues utilizing technology, potentially resulting in the enhancement of their technology self-efficacy. The study additionally found that the utilization of vicarious learning experiences might assist teachers in boosting their level of confidence in successful TI within their respective classrooms (Wang et al., 2004).

The third way of strengthening one's self-efficacy is verbal persuasion. It included comments or encouragement from other people (Bjerke & Xenofontos, 2023). Although verbal persuasion is a common attempt at promoting self-efficacy, like vicarious experience, it is not as strong of a source of self-efficacy as performance accomplishments. The provision of positive verbal support and expressions of appreciation towards teachers by individuals in their social environment has been found to have a positive impact on their self-efficacy beliefs (Kasalak & Dağyar, 2020). However, Bandura (1997a) asserted that it was more difficult to inculcate high levels of personal efficacy through verbal persuasion than it is to erode them. People who have been convinced that they lack abilities avoid demanding activities that can help them develop their potential, and they give up easily when faced with problems (Bandura, 1997a). Thus, positive feedback and encouragement could be more effective than criticism to strengthen one's self-efficacy. The verbal persuasion in teachers' TSE could refer to the feedback, encouragement, and suggestions the teachers received from their school leaders, peers, and students regarding the use of technology which affects teachers' TSE. Meanwhile, there is an ongoing debate within educational settings regarding the categorization of social persuasion among the existing studies. For example, some scholars categorized the perceived student enthusiasm as a mastery experience, whereas others included it in the category of social persuasion (Morris & Usher, 2011).

The final source is emotional arousal, which is one's emotional strength and weakness such as agitation and stress that can influence on their self-efficacy development. That is, they could result in failure or success (Luangpipat, 2017). In other words, people also judge their ability in part based on their emotional states. They view their tension and stress responses as indicators of susceptibility to subpar performance (Bandura, 1997a). That is to say people's feeling of anxiety and being afraid of failure in performing a task could decrease the level of self-efficacy. In contrast, the absence of these emotional states could guarantee their strong self-efficacy. Concerning teachers' TSE, emotional arousal, which is the stress, anxiety, and tension the teachers may have when integrating technology could result in lowering the levels of TSE.



Source Bandura (1977, 1997a)

Figure 2.1 Four Sources of Self-Efficacy

However, given that self-efficacy is influenced by the context in which it is situated (Henson, 2002; Alibakhshi et al., 2020), the factors that impact it can differ based on the specific setting individuals are exposed to or the specific professional fields in which they work. In other words, various teachers have varied social and cultural associations, and the factors that affect their levels of self-efficacy can vary from one teacher to the next. The factors affecting teachers' self-efficacy can exhibit variability among individuals due to their distinct social and cultural affiliations (Mehmood, 2019). The extant literature has identified several factors that influence TSE, including PD opportunities and PLCs, which equip teachers with the necessary knowledge and skills. Furthermore, the perception of a specific type of technology by both teachers and students may also have an impact on teachers' TSE.

2.10.2 Teacher Professional Development

2.10.2.1 Definition of Teacher Professional Development

Teacher Professional Development (TPD) can be simply defined as teachers' participation in opportunities to obtain new knowledge, skills, or strategies that improve and build upon their current knowledge (Lassonde & Israel, 2010). That is, it refers to teachers' participation in any event or activity to upgrade their teaching profession. Likewise, according to Abdalina et al. (2022), TPD involves the enhancement of educators' competencies, knowledge, skills, and abilities that they currently use or will use in professional activities. TPD is linked with student outcomes in particular teaching areas and the knowledge and skills developed are those that have been established as effective in achieving valued student outcomes (Timperley, 2008). The concept of TPD can be viewed from several different perspectives, each with its actual premise, and is informed by different bodies of research. Despite the apparent lack of consensus, most of the literature described TPD as an intentional, ongoing, and systematic process (Gabriel et al., 2011) of formal and informal education, training, learning, and support activities. It is proactively engaged by qualified, professional teachers, school principals, and other school leaders, alone or with others, which has direct or indirect benefits to the individual teacher, the school, and the nation (Day, 2002). TPD can be in-service training in which teachers participate voluntarily and in-service training that is organized by an institution and among the two in-services in which teachers choose to participate seem to be more effective (Özer et al., 2020). Morgan and Neil (2004) suggested several sources of TPD including private reading, private or group research, in-school activities, off-site courses, and networking with other schools. In private reading, the teachers may access relevant journals or books to keep up to date with subject knowledge and subject pedagogy. Private or group research involves "private reading but here there is much more focus and structured post-reading activity" (Morgan & Neil, 2004, p. 97). They clarified that teachers could carry out private research on their own that meets their own needs, while group research can also be carried out with groups working together. Research participation and engagement are considered beneficial undertakings for teacher TPD (Derakhshan et al., 2020). In-school activities, any training provided by schools focuses on the particular and understood needs of the school. In the offsite courses, the courses will take two forms

either where members of staff physically/ geographically switch sites, or where a course is run at a distance but distributed to the participants (electronically or by other means). Finally, networking with other schools involves sharing practice across schools. Richards and Farrell (2005) offered various tools that contribute to language TPD, namely, teacher education, workshops, self-monitoring, teacher support groups, keeping teaching a journal, peer observation, teaching portfolios, analyzing critical incidents, case analysis, peer coaching, team teaching, and action research. Richards and Farrell (2005) explained the tools as follows:

1. Teacher education refers to the training provided to the teachers that can include pre-service and in-service training.

2. A workshop is "often the best way of exploring what a particular professional activity, such as action research, consists of, what its pros and cons are, and whether it might be of interest to teachers" (p. 23).

3. Self-monitoring refers to "activities in which information about one's teaching is documented or recorded to review or evaluate teaching" (p. 34).

4. Teacher support refers to the collaboration between teachers to accomplish either their individual or shared goals or both on the notion that group work is usually more effective than individual work. Teachers can raise the issues for advice, and help from others.

5. Keeping a teaching journal is a continuous written record of ideas, reflections, and other thoughts on teaching, usually held in the form of a diary, text, or electronic medium, and used as a means of conversation, contemplation, or reflection.

6. Peer observation refers to "a teacher or other observer closely watching and monitoring a language lesson or part of a lesson to gain an understanding of some aspect of teaching, learning, or classroom interaction" (p. 85).

7. A teaching portfolio is a collection of teachers' works and it provides evidence of the improvement of a teacher.

8. Analyzing critical incidents are unintended actions happening during a lesson, and they tell the issues that can use as guidance to shape classroom practices.

9. Case analysis involves "collecting information over time about a teaching situation and using that information to help better understand the situation and to derive principles from it" (p. 126).

10. Peer coaching refers to a process in which two teachers cooperate to help one or both teachers develop some aspect of their teaching.

11. Team teaching or pair teaching is “a process in which two or more teachers share the responsibility for teaching a class” (p. 159).

12. Action research involves “a cycle of activities centering on identifying a problem or issue, collecting information about the issue, devising a strategy to address the issue, trying out the strategy, and observing its effects” (p. 171).

In the last decades, TPD has been a topic of debate and some scholars have dismantled the term. Meanwhile, some scholars embraced teacher professional learning instead since TPD seems to embrace the notion that “one size fits all”. Professional development is planned formally and externally whereas professional learning is more unstructured and is led by the individual (Utami & Prestridge, 2018). In this regard, when it comes to TPD, it is assumed that all teachers who are invited to participate in professional training lack the same skills and knowledge, whereas the professional learning concept emphasizes that different teachers require different training regarding different skills and knowledge. In addition, there has been a consensus that teachers and their students benefit greatly from professional learning (Main et al., 2020). Teachers who embrace the professional learning concept are more likely to be creative and resourceful, which can have a profound effect on their students’ learning (Irwan & Putra, 2021). However, Main et al. (2020) noted that, in the literature, PD and professional learning are used interchangeably, but professional learning is increasingly used to refer to PD. In this regard, it has been observed that PD or professional learning, regardless of its structure, is not a determining factor. Rather, the crucial aspect lies in whether it effectively equips teachers with the necessary skills and knowledge for integrating technology. The significance of training in facilitating the successful integration of technology into instructional practices by teachers has been widely acknowledged.

In the context of NGS in Cambodia, TPD comes into several models namely pre-service/initial training, career planning, mentoring, in-service training, PLCs, international study trips, and principal support (Donaher & Wu, 2020). This study focuses on two models of TPD, namely training and PLCs. The raining in this study focuses on the structured and external training designed by schools or MoEYS, while

PLCs are less structured and more self-selected PD activity focus. Specifically, the study focuses on PLCs in terms of collaborating, sharing, and reflecting among the teachers.

2.10.2.2 Significance of TPD in TSE and TI

TPD has been shown to influence teachers' self-efficacy regarding their ability to teach, manage the classroom, and engage students (Zhou et al., 2022). It has been acknowledged that it holds great potential in determining teachers' TSE. Teachers who have participated in professional training regarding technology use tend to have a high level of TSE (Gokbel, 2020). It is essential for bolstering teachers' technological skills and confidence, thereby promoting the use of technology in their classrooms (Zhou et al., 2022). The possession of sufficient technological knowledge and skills has been identified as a crucial prerequisite for the development of teachers' TSE (Kwon et al., 2019). Conversely, the absence of such knowledge and skills can lead to feelings of incompetence among teachers, potentially diminishing TSE (Silviyanti & Yusuf, 2015). In other words, teachers need sufficient skills and knowledge to have a high level of confidence in integrating technology in a classroom setting (Ghavifekr & Rosdy, 2015). The skills and knowledge can be developed through TPD (Beberman, 2020). Simply put, the technological skills and knowledge that the teachers received from their participation in professional training activities would escalate their self-efficacy in using technology. Studies also indicated that TPD could affect teachers' TSE. Gomez et al. (2022) also indicated that teachers' confidence in their ability to use technology for professional practice was influenced by TPD. Another study (Hall et al., 2019) also indicated that teachers' TSE was improved after the teachers had participated in professional training.

TPD is essential to improve teachers' teaching quality with technology. The increase in the available technology, which can be used in the education field, requires teachers to integrate it into their classroom instruction. They are required to determine the suitability of various technologies for specific subject areas and devise strategies for their integration into the instructional process (Simsek & Yazar, 2019). Thus, teachers need technological skills and knowledge to integrate the available technology into their teaching. Numerous scholars asserted that TPD in using technology is a significant determinant of TI. Even though schools have enough educational

technologies, teachers and students do not always use them to teach and thus most efforts to improve how technology is used in schools have focused on training teachers (Davies & West, 2014). Since there are many forms of technology including computers, mobile devices, digital cameras, social media platforms and networks, software applications, the Internet, and so forth that teachers can use in their classroom instruction (Gokbel, 2020), the skills and knowledge in using these available and accessible technology have become must-have for teachers (Lawless & Pellegrino, 2007; Richards, 2015; Ruggiero & Mong, 2015; Gokbel, 2020). In addition, TPD is essential to the successful integration of technology (Lawless & Pellegrino, 2007) since it is one of the most influential elements (Beberman, 2020). This notion was supported by the prior study which revealed that TPD was the predictor of TI (Chaaban & Ellili-Cherif, 2017). TPD concerning the use of technology is critical in deciding whether teachers use technology (Dube et al., 2018), while the lack of it leads to the lack of technology integration (McGee, 2015; Ruggiero & Mong, 2015; Thoma et al., 2017).

There has also been growing evidence indicating that TPD plays a crucial role in TI. The enhancement of TPD is a crucial component in effective TI (Hawkins, 2002). The study conducted with English language teachers who used Zoom to provide classes during the COVID-19 outbreak indicated that in addition to the teacher's pedagogical beliefs, the level of TI was also influenced by PD in addition to other factors (Cheung, 2023). To effectively incorporate technology into their instructional practices, teachers must possess a diverse array of knowledge (Kukul, 2023). Previous research (Chaaban & Ellili-Cherif, 2017; Kusuma, 2022; Zhou et al., 2022; Cancino & Ibarra, 2023) has indicated EFL teachers would benefit from additional training to acquire the essential knowledge and skills required for effective teaching. This is true for both novice and experienced teachers. For instance, the study by Zhou et al. (2022) indicated that EFL teachers with greater experience exhibited a deficiency in their understanding and utilization of technology. The study suggested that possessing teaching experience does not necessarily equate to proficiency in utilizing technology, thereby necessitating the provision of training for all EFL teachers. The study by Spencer (2019) also suggested that teachers need effective PD on how to use technology. The study by Akram et al. (2022) found that the lack of training, in addition to other obstacles, was cited as the primary barrier preventing teachers from effectively integrating technology into their teaching practices.

The findings also revealed that the lack of PD training hinders EFL teachers from integrating technology into their classroom instruction (Alghasab et al., 2020). Another study by Mafuraga and Moremi (2017) found that knowledge from training in using available technology is crucial to help them integrate ICT into their English class. Teachers also need to be trained on how to use online student response systems like Kahoot! Socrative, Quizzizz, Google Forms, and Google Classroom (Cancino & Ibarra, 2023).

Nevertheless, the quality of what is done with technology is more essential than its usage itself and the use of technology must be meaningful (Skorczynska et al., 2016). TI is observed teachers receive effective training on various technology applications and their suitable roles (Summak et al., 2010). It has been observed that the specific training programs may not sufficiently provide EFL teachers with the requisite knowledge and skills. Therefore, it is crucial to offer them effective training that enables them to proficiently incorporate technology into their instructional practices. Effective training may involve multi-facets. Effective training should hold the potential to change teachers' behavior or practice. The better teachers are trained in technology integration, the more successful technology integration will be (Kukul, 2023). The goal of PD training programs is to disseminate new information and subsequently bring about a change in teachers' practice (Darling-Hammond et al., 2017; Fatmi & Chouari, 2019) and better outcomes for students (Darling-Hammond et al., 2017). It has focused on how to integrate technologies into modern teaching and learning environments (Blanchard et al., 2016), so it aims to assist teachers in learning to adapt and improve when emerging technology evolves, as well as continue to incorporate technology in the context of their pedagogy and curriculum contents (McGee, 2015; Beberman, 2020). That said, based on previous research, McConnell et al. (2013) noted that most training programs come in the form of short workshops that do not change teachers' practices. In other words, such short training may not yield a favorable outcome (Duran et al., 2011). Therefore, to have an impact on teachers' behavior or practice, effective training should provide a sufficient amount of time for teachers to acquire the necessary knowledge and skills.

Furthermore, the training program comprehensively should cover all aspects and concerns in teachers' classrooms (Sutton, 2011). It might be counterproductive if it does not reflect actual classroom practice (Hinson et al., 2006). Effective training may also provide a practical experience where teachers practice using technology and receive

support from the trainees when they encounter problems. In a practical way, hands-on training, teachers could work together with a facilitator to explore a variety of technological tools and it gave teachers a chance to learn about the technological tools and the technology curriculum, as well as show how well they could work together and solve problems (Sheffield et al., 2018). Providing the teachers with follow-up support could be the other aspect of effective training. In their actual classroom practice after being trained, teachers may require additional support as they may encounter difficulties when incorporating technology into their instructional practices. In their study, Yurtseven Avci et al. (2020) noted that such support is a crucial part of effective training and thus suggested that qualified PD organizing team members should follow up with teachers during classroom applications to address technical and instructional issues. Moreover, for technology to be used effectively, schools must provide the necessary training to teachers so that they can make the best use of technology in language instruction (Richard, 2015).

In general, effective PD training is necessary for teachers to become tech-savvy which could affect teachers' TSE and TI. Simply put, to improve their levels of self-efficacy in making use of the technology that is currently available, teachers need to develop their technological skills and knowledge. Effective PD training provides them with such skills and knowledge for utilizing the technology.

2.10.3 Professional Learning Communities (PLCs)

2.10.3.1 Definition of PLCs

PLCs can be succinctly defined as collaborative learning that allows teachers to share their knowledge and teaching experiences. In PLCs, teachers may use different communication modes to discuss and share their classroom experiences. That is, they could interact either physically or digitally to learn and share a common concern. PLCs are similar to communities of practice in that they both refer to groups of professionals with shared objectives, but they are distinguished by their focus on positively influencing student learning and outcomes (Glaze-Crampes, 2020). Accordingly, teachers as active members have the opportunity to learn from one another concerning their classroom issues. This is of significance for improving teaching quality and enhancing students' learning performance and achievement. Communities of practice are ubiquitous since any group of people can become a community of

practice if they share a vision, resources, and reflection to enhance practice (Glaze-Crampes, 2020). In this regard, PLCs seem to be more school or education-related. PLCs can also be different from traditional training or workshops because PLCs prioritize the needs of teachers when it comes to professional development (Paulus et al., 2020). PLCs place a strong emphasis on social, collective, and contextual learning that is embedded in instructors' everyday classroom activities (Feldman, 2020). The members in PLCs may include not only the teachers and the teachers; the members may include different people from different working positions in school who work together across the school, not just in groupings of particular subjects, phases, or roles (Bolam et al., 2007). PLC members may include teachers, school administrators, and other stakeholders. However, since the main purpose of PLCs is to enhance student learning (Bolam et al., 2007; Stoll & Louis, 2007), according to Stoll and Louis (2007), PLCs have traditionally been used to refer to groups of teachers who were supported by school leaders. In PLCs, teachers work together to support the pedagogical change to deal with the challenges and continually improve their teaching practice (Feldman, 2020). In PLCs, Mitchell and Sackney (2007) noted that teachers were not only instructors but also learners who received valuable and captivating insights from their pupils, the wider society, their peers, and the guardians of their learners. They added that it has been observed that educators who engaged in active learning exhibit novel and stimulating concepts, and the enthusiasm derived from their professional development invigorates their instructional settings. PLCs inspire the member spirit since the members' experiences and knowledge are valued. Mitchell and Sackney (2007) suggested five principles of engagement in PLCs:

Deep respect is the basis for all involvement and other ideals. Following this philosophy, people care for children and adults personally and professionally. Parents and community people are welcome in the school and classroom, and doors between colleagues and classes are open. Deep respect views each student, teacher, staff member, administrator, parent, and community member as a valued participant in the school's life, with ideas and thoughts to contribute and a vital role to play.

Collective responsibility, the second principle of engagement, is the most common in our research schools. This approach encourages all staff members to take responsibility for all schoolchildren, not just their own.

The third principle is an appreciation of diversity. This principle situates diversity as a fundamental tenet of the educational institution. The celebration of diversity is valued as a catalyst for novel knowledge acquisition, personal advancement, and progress.

The fourth engagement principle is *problem-solving orientation.* This principle helps people stay flexible and withstand the ambiguity and uncertainty of active experimentation and constant change, which are necessary to a learning community. This principle encourages school staff to question their practice (professional, learning, administrative, etc.) and its impact on colleagues, classmates, students, parents, and others.

Positive role modeling is the fifth and final engagement principle. This principle emphasizes that all members of the school community, including students, are encouraged to think about what they are teaching and what others may be learning from their actions and comments. All community members, including teachers, are encouraged to consider what they are learning at each moment. This principle encourages the creation of a wide range of teaching and learning options and distributed leadership, where people from all stakeholder groups seek out opportunities to learn and lead.

Similarly, based on the previous studies, Chen (2023) suggested five characteristics of effective PLCs: (1) Shared values and goals require all members regardless of their hierarchical positions to actively participate in sharing common goals and values. (2) Supportive and shared leadership necessitates all individuals, including teachers and administrators to get involved in the decision-making processes. (3) Sharing personal practice involves sharing personal classroom practices and giving feedback among members for the improvement of the community. (4) For collective learning and application, teachers work together to identify teaching challenges and deal with students' learning needs. (5) Supportive conditions are a supportive environment such as time, place, and other external support. However, Chen (2023) admitted that some other characteristics are contributing to effective PLCs.

In any form of PLCs and based on the principles of engagement suggested by Mitchell and Sackney (2007) and five characteristics proposed by Chen (2023), PLCs allow their members to share and learn from each other, which is significant for

effective teaching, and improve students' learning in the whole school not just for students the individual's classroom.

2.10.3.2 Effective PLCs in TSE and TI

PCLs aimed at facilitating teachers' acquisition of instructional technology skills can also encompass a range of interconnected components. PLCs have been acknowledged that they play a crucial part in helping teachers integrate technology into their teaching. PLCs are important for today's education (Stoll & Louis, 2007). The previous study (Anderson & Olivier, 2022) showed that PLCs positively influenced TTSE. In other words, PLCs can affect teachers' beliefs and practices concerning technology use (Cheng, 2017). Time, resources, and professional development are all obstacles to integrating technology into the classroom and PLCs could be one way to help teachers overcome these obstacles (Thoma et al., 2017). In addition, when training cannot satisfy the teachers' needs, PLCs could fulfill them. Concerning this, the study revealed that teachers, as a result of insufficient PD training, tend to depend heavily on informal training methods, such as collaborative learning within small sub-groups, to enhance their technological proficiency (Alghasab et al., 2020).

As mentioned in the NGS Policy Guideline (MoEYS, 2019a), NGS teachers are required to organize PLCs. In PLCs, teachers are encouraged to meet regularly to share information, create teaching and learning materials, report on their experiences to the group, and so on. The NGS teachers form subject-area or grade-level groups to cooperate, reflect, and exchange ideas on their instructional approaches to fulfill students' learning goals and their professional progress (Bo, 2021). The meeting can be in person using the available rooms, and online using social media (MoEYS, 2019a). In this regard, in NGS, PLCs also play significant roles in helping teachers who teach the same subject to learn from and share teaching techniques, constructing teaching and learning materials, and so on. In addition, NGS teachers may learn the experience of integrating technology and technological skills from one another. With such knowledge and skills, teachers would feel more confident (self-efficacy) in using technology.

For teachers to effectively implement PLCs regarding TI into their teaching practices, teachers must be provided with comprehensive support and sufficient opportunities to engage in collaborative discussions. Additionally, the guidance and endorsement of school leaders or administrators are crucial in facilitating the successful

implementation of instructional technology in educational settings. The study conducted by Thoma et al. (2017) found that teachers required both a facilitator and an adequate amount of time for collaborative learning to effectively incorporate technology into their instructional practices. Leadership is a crucial factor that has the potential to influence the effectiveness of PLCs. The facilitation of effective PLCs within educational institutions is assumed to be a crucial responsibility of principals or school administrators (Binkhorst et al., 2015; Reynolds, 2016; Chen, 2023). According to Reynolds (2016), it is imperative to have a leader who is perceived as trustworthy and reliable to assist teachers as they collectively navigate through various obstacles and achievements.

2.10.4 Teachers' and Students' Perceptions

The individuals' perceptions of the technology have been acknowledged as the determinants of teachers' TSE and TI. Teachers' perception of technology is how the teachers believe in the benefit of technology in teaching and learning; such belief could determine TI (Tilton & Hartnett, 2016; Önalan & Kurt, 2020). If teachers did not perceive any advantages in incorporating it into their instructional practices, they would lack the confidence to integrate it into their classroom lessons (Kumar & Daniel, 2016). Teachers' perception could also affect their TSE. The impact of TI in educational settings may be influenced by teachers' perceptions regarding the extent to which technology can enhance their instructional practices (Incantalupo et al., 2014; Silviyanti & Yusuf, 2015). Teachers are more inclined to incorporate technology into their teaching practices if they perceive it to have a beneficial impact on their students' learning outcomes (Harrell & Bynum, 2018). The study by Ertmer et al. (2012) indicated the attitudes and beliefs of teachers regarding technology were identified as one of the barriers impeding their utilization of technology, alongside other factors. Other research indicates that the degree of TI is contingent upon the teachers' perception of the function of technology in supporting the learning process (Mama & Hennessy, 2010). The study investigating lecturers' perceptions of technology adoption and the influential factors indicated that they valued the impact of learning technologies on improving student learning, but several factors, such as their attitude towards technology and their perception of its usefulness in teaching, are likely to influence

technology adoption and integration into their instructional practices (Kumar & Daniel, 2016).

In the EFL setting, the studies indicated that most teachers positively perceived technology in their class (Mollaei & Riasati, 2013; Regan et al., 2019; Canbay, 2020; Al-Anezi & Alajmi, 2021; Basar & Sahin, 2022; Eryansyah & Erlina, 2023) and other studies found that the teachers' perception of technology could affect TI (Regan et al., 2019; Almalki, 2020). In this regard, if a teacher positively perceives technology in teaching, he or she is more likely to adopt and use it effectively in his or her class (Almalki, 2020). The studies also revealed that EFL teachers' perception predicted TI in their English classes (Chaaban & Ellili-Cherif, 2017; Canbay 2020). That is, the teachers who positively viewed the significance of technology in language education strived to incorporate it into their teaching. Furthermore, teachers' perceptions could also affect their TSE. The study revealed that there was a significant correlation between individuals' perceived comfort with computer technology and their self-efficacy beliefs toward technology integration. However, no significant predictive relationship was found between perceived usefulness and self-efficacy beliefs. The research study revealed that there was a significant correlation between individuals' perceived comfort with computer technology and their self-efficacy beliefs toward TI. However, no significant predictive relationship was found between perceived usefulness and self-efficacy beliefs. The research study revealed that there was a significant correlation between teachers' perceived comfort with computer technology and their TSE (Abbit & Klett, 2007).

Besides teachers' perception, students' perception of technology is another determinant of TSE and TI. The student's perception of technology is important as it affects the level of their engagement (Farah, 2012; Slutsky, 2016). To put it in another way, if students do not believe technology could help their learning, they will not be interested in the class with TI, which leads to the failure of technology use in class. Language classrooms have the potential to become technologically advanced environments when teachers assist students in recognizing the essential role of technology within the curriculum (Cennamo et al., 2009). In this sense, EFL teachers need to identify their students' perceptions so that teachers can develop students' positive perceptions of technology. In addition, the previous studies conducted to

examine students' perception of technology proved that their perception reflected the positive use of technology. For instance, the study of Izadpanah and Alavi (2016) showed that students positively perceived technology in learning English learning, and those with previous experience in technology use are likely to benefit more. However, the study found that no significant predictive relationship was found between perceived usefulness and TSE (Abbit & Klett, 2007).

In conclusion, it is also possible that students' perceptions of technology held by both teachers and students are the primary elements that influence teachers' TSE. In other words, if teachers have a favorable perception of the crucial role that technology plays in teaching and learning, they will display a high level of self-efficacy in incorporating technology in their classrooms. In a similar vein, how students view technology may be able to serve as a prediction of how engaged they will be when that technology is used in their classroom. This will also affect teachers' TSE, and it will force teachers to decide whether to include technology in their lessons.

2.11 The Other Related Factors Affecting Teachers' Technology Self-Efficacy (TSE)

Besides TPD, technological knowledge, and skills in using technology, teachers, and students' perceptions, other factors can also affect teachers' TSE. Teachers' technological knowledge could influence their TSE level and TI. The studies also found that teachers' technological knowledge affected teachers' TSE (Joo et al., 2018; Bakar et al., 2020; Xu & Zhu, 2020; Zhang & Fang, 2022). That is, teachers would not have significant confidence in their capacity to use technology if they did not have adequate knowledge of how to use instructional technology. However, Kwon et al. (2019) argued that even teachers with sufficient skills in using technology might experience low TSE due to various reasons. To this end, knowledge of using technology was not the only factor.

Another factor that can influence the ability to learn about TI is the availability of time or opportunities. If teachers were provided with sufficient time to acquire proficiency in utilizing technology, it is likely that their self-efficacy levels would be

diminished (Tilton & Hartnett, 2016). In essence, through the provision of adequate time and support for learning about TI, teachers will acquire the necessary knowledge and skills to enhance their confidence in employing technology. Technological devices could be another factor affecting teachers' TSE. The availability and accessibility of technological devices play a significant role in enabling the integration of technology. Consequently, in the absence of adequate resources, teachers may experience a lack of confidence when it comes to integrating technology into their instructional practice.

Moreover, it is acknowledged that the impact of teachers' previous experience with TI could also influence their TSE. Successful experience with TI could increase TSE while failure may lower it (Wang et al., 2002; Hershkovitz et al., 2023). Many previous studies found that different and similar things affect teachers' TSE. The factors included teachers' experience with technology (Šabić et al., 2022; Hershkovitz et al., 2023). For instance, the study by Hershkovitz et al. (2023) looked at the factors that led to a feeling of success in emergency remote teaching and self-efficacy for using technology in teaching after teaching during the COVID-19 days. They found that experience in teaching with technology was an important factor that boosted a sense of success and self-efficacy.

There have been some other factors found to be factors affecting teachers' TSE. For instance, the study revealed teachers' characteristics such as gender, teaching experience, and experience in using technology may be the other factors associated with the level of teachers' TSE (Šabić et al., 2022). Another study revealed that the innovative climate in their organization affected teachers' TSE (Andyani et al., 2020). The other study indicated that the factors that increased teachers' TSE included student performance, supportive leadership and climate, effective group work among colleagues, and open-mindedness toward technology, while factors decreasing teacher efficacy encompassed adherence to a unified teaching model imposed by the department, technology's non-user-friendly, and impersonal characteristics (Zhang & Fang, 2022). Kwon et al. (2019) also found a link between teachers' TSE and the challenges they faced.

The results of the existing studies showed that the factors that affected teachers' TSE varied depending on the setting. Because of this, it is clear that there is a need for more research into the novel context. Overall, in addition to the four sources of self-

efficacy, time constraints, the limited availability of technological resources, the technological knowledge of both teachers and students, student performance, a restricted school curriculum, the leadership of the school, emotional and financial support, the characteristics of teachers, and other factors could all have an impact on teachers' TSE.

2.12 The Other Related Factors Affecting Technology Integration (TI)

Various factors could affect TI, and the factors are also associated with ones affecting TSE. The factors include the lack of time and resources (Mollaei & Riasati, 2013; Chun et al., 2016; Thoma et al., 2017; Raja & Nagasubramani, 2018; Regan et al., 2019; Önalan & Kurt, 2020), and teachers' knowledge or literacy in using technology (Chun at el., 2016; Almalki, 2020; Amar & Eleyan, 2022; Zhang & Fang, 2022). Before being able to use technology as a learning tool, one must be able to use it (Davies, 2011). Because teachers are practitioners of educational activities, their technological knowledge is also the most important since it will decide if the curriculum's stated educational objectives are met (Isikli & Sezer, 2022). In other words, teachers would not integrate technology into their actual instructional classroom if they did not know how to use it and it would affect the educational goal. The research also found that technological knowledge was one of the significant determinants of TI. For instance, the study by Raygan and Moradkhani (2022) investigating EFL teachers' attitudes, technological pedagogical content knowledge (TPACK) level, and educational climate revealed that teachers' knowledge and attitudes predict technology integration. Student's knowledge of using technology also holds potential in TI in class. At the highest level of technology literacy, learners have become adept at using technology because when they are skilled at learning new technology and are not afraid to use technology to accomplish their learning goals (Davies, 2011). When most students can use technology, teachers will not face any difficulties in integrating technology into their teaching.

Some other factors include the academic culture of the institution (Chun et al., 2016), the restricted curriculum, stifling the use of technology in practices aligned with

the teachers' pedagogical practices (Ruggiero & Mong, 2015), and the principal's leadership (Amar & Eleyan, 2022). The effective integration of technology in education is heavily influenced by the technological knowledge and skills possessed by teachers (Akram et al., 2022). Previous research indicates that the absence of administrative support is widely recognized as a significant obstacle to successful TI (Tarman et al., 2019). The school leader is the key person who plays one of the key roles as a technology leader. It is the responsibility of school leaders to encourage and assist instructors in integrating technology (Raman & Thannimalai, 2019). That is, the leadership role of the school leader exerts the influence on teachers on whether or not to adopt the technology. Similarly, Beberman (2020) stated that the feeling of support that teachers must have was also an essential factor. Technical support through providing knowledgeable people to work with teachers could be another factor. The study by Spencer (2019) suggested that teachers need someone they can work with on technology to improve how they use technology. The other study indicated that besides infrastructure-related issues and teacher technological knowledge, education policy was also the challenge teachers faced when technology was incorporated into their teaching (Ningsih et al., 2022). The experience with technology is also at play in determining TI. The study revealed that teachers with more experience and high levels of technical competency adopted technology because they wanted to improve their teaching methods, whereas less experienced teachers were less eager to adopt it and incorporated it inconsistently (Tennant & Elizabeth, 2019).

Some other factors include technological resources, parental support, and personal financial contain teachers are not likely to integrate technology into their classrooms unless they have access to sufficient equipment and a well-developed technological infrastructure (Vrasidas & Glass, 2005). Likewise, the studies revealed that various factors impeded the utilization of technology. These factors encompassed facilities, resources (Alghasab et al., 2020; Eryansyah & Erlina, 2023), inadequate parental support, personal financial constraints, health issues, time limitations, and workload burdens (Alghasab et al., 2020). However, among the mentioned factors, the other existing studies indicated that time was the main challenge (Dinc, 2019; Francom, 2020). The study (Dinc, 2019) also showed in addition to the lack of the lack of equipment and technological knowledge, funding was also a factor. Regarding this, the

institutions play an important role of supporting the teachers to integrate technology into their teaching in terms of providing sufficient infrastructure and making technologies available for teachers to access. Al-Anezi and Alajmi (2021) asserted that infrastructures and financial status influenced the institution to decide whether to adopt technologies or not. In this regard, the financial resource is another factor indirectly affecting TI. This is particularly true in less developed nations like Cambodia. Richardson (2013) also said that in less developed countries the initiatives to integrate ICT into education are further hampered by financial constraints.

2.13 Other Relevant Studies Regarding the Factors Affecting Teachers' Technology Self-Efficacy (TSE) and Technology Integration (TI)

There have been some studies conducted to investigate factors affecting teachers' TSE and TI in various contexts. Farah (2012) conducted a case study intending to explore the factors affecting teachers' TSE with 9 K-12 teachers from a public school district in Northeast Georgia. The results revealed that the factors that affected teachers' TSE included work-related factors connected to PD, participants' previous training and experiences connected to instructional technology, and the amount, availability, and types of previous and current PD opportunities. The results also suggested that lack of time and PD opportunities regarding instructional technology and no confidence in using technology are the barriers to TI.

Similar to the study by Farah (2012), the study by Slutsky (2016) showed that TPD could affect teachers' TSE and lead to TI. Slutsky (2016) conducted the mixed method study using survey questionnaires and interviews with the teachers at two middle schools and one high school located in a rural area of the Southern United States. The study aimed at examining the teachers' levels of teachers' TSE, identifying particular factors influencing their current level, and examining the role and impact PD opportunities have on levels of technology self-efficacy. The finding suggested that teachers' TSE could be increased through PCLs, ongoing support, and coaching. Slutsky (2016) concluded that "when all administrators, instructional technology facilitators, academic coaches, teachers,

and students are working together in an intentional environment, we will see transforming practices in the classroom" (p. 120).

Another study by Gomez (2020) revealed that teachers' TSE is of significance in effective TI. Gomez (2020) conducted the study to examine self-efficacy as a factor in teachers' technology use and integration efforts, the participants in this study were urban K-12 teachers in multiple Catholic school settings from Southern California, USA who had access to utilize and integrate technology in class. The result revealed that teachers' self-efficacy was an essential factor in effectively using and integrating technology in their teaching practice and PD involvement is the key influential factor on teachers' self-efficacy.

Besides the significant roles of PD and TSE in TI, the study by Gokbel (2020) also suggested that collaboration among the teachers would also play a crucial role in enhancing the successful TI. Gokbel (2020) surveyed a sample of 136 mathematics teachers from different schools in Turkey. The study was to determine whether TPD and their TSE had a significantly positive association with technology implementation in classroom instruction. The result showed that the two factors namely TPD and teachers' TSE are two major factors influencing teachers' successful integration of instructional technologies. Regarding PD opportunities, the study suggested that in-school collaboration among teachers on learning to use technology positively influences teachers' classroom technology use for more rigorous tasks.

In addition, another existing study (Almalki, 2020) indicated that teachers' perceptions alongside their literacy in using technology were another factor affecting TI. Almalki (2020) conducted a study with 38 Saudi EFL instructors to investigate the factors including teacher age, level of technological proficiency, and teacher perception of technology that influence the integration of new technologies in EFL classes. The study showed that teachers' proficiency in using technology and teachers' perception of technology affect technology integration. Almalki (2020) also suggested that TPD in using technology and support should be provided for the teachers to encourage them to integrate technology.

Raman and Thannimalai (2019) conducted their research in a Malaysian setting involving 90 secondary school teachers and also revealed that PD demonstrated a

noteworthy level of effectiveness and played a significant role in predicting the degree to which teachers incorporated technology into their teaching methods.

Although most studies showed that PD was significant in TI, another study by Beberman (2020) indicated TPD did not enhance TI. Beberman (2020) conducted a study using survey questionnaires of 218 teachers from suburban school districts in Nassau County, on Long Island, New York to describe the extent to which self-efficacy is fostered by the type of technology integration professional development. The study indicated that teachers' TSE was low, but the study did not explore why it was low. Additionally, TPD did not foster teacher self-efficacy in integrating technology. The researcher assumed that technology was quite new in the curriculum and every teacher learns to use it because they are required to, not because it is a natural part of their pedagogy.

Regarding the mentioned studies conducted in different contexts to investigate the factors affecting teachers' TSE, it can be concluded that teachers' TSE is associated with TI. In addition, the common factor affecting teachers' TSE and TI is teachers' technological knowledge obtained through PD. However, TPD is not the only factor like the study conducted by Beberman (2020) which indicated that TPD did not boost teachers' TSE since technology was quite new to most teachers in the context of his study. In this respect, a study in other contexts is still needed and therefore the current study would be crucial as the findings would shed light on how to encourage EFL teachers to integrate technology into their teaching. In other words, the majority of studies examining factors related to TSE were quantitative research. Alibakhshi (2020) hereof argued that "as self-efficacy is a context-specific phenomenon and multilayered, the positivistic tools of inquiry such as correlational or experimental studies might not be appropriate for studying such a phenomenon" (p. 2). Accordingly, qualitative research methods such as in-depth interviews may be more appropriate for collecting data on the factors that influence TSE. In addition, less research has been conducted to identify the factors affecting teachers' TSE in the EFL context. Nevertheless, EFL teachers who possess a strong sense of TSE may still refrain from incorporating technology into their instruction as a result of several external factors that impact TI. To this end, it would be helpful for school leaders or managers to know what affects both EFL teachers' TSE and TI so they can encourage those teachers to use technology in the classroom.

2.14 Research Conceptual Framework

The proposed research conceptual framework regarding the variables identified in this study encompasses independent and dependent variables. According to Sahu (2013), dependent variables are influenced by other related variables. The related variables in this study are independent because Sahu defined independent variables as those that help predict the dependent variables. In other words, independent variables affect or cause changes in dependent variables.

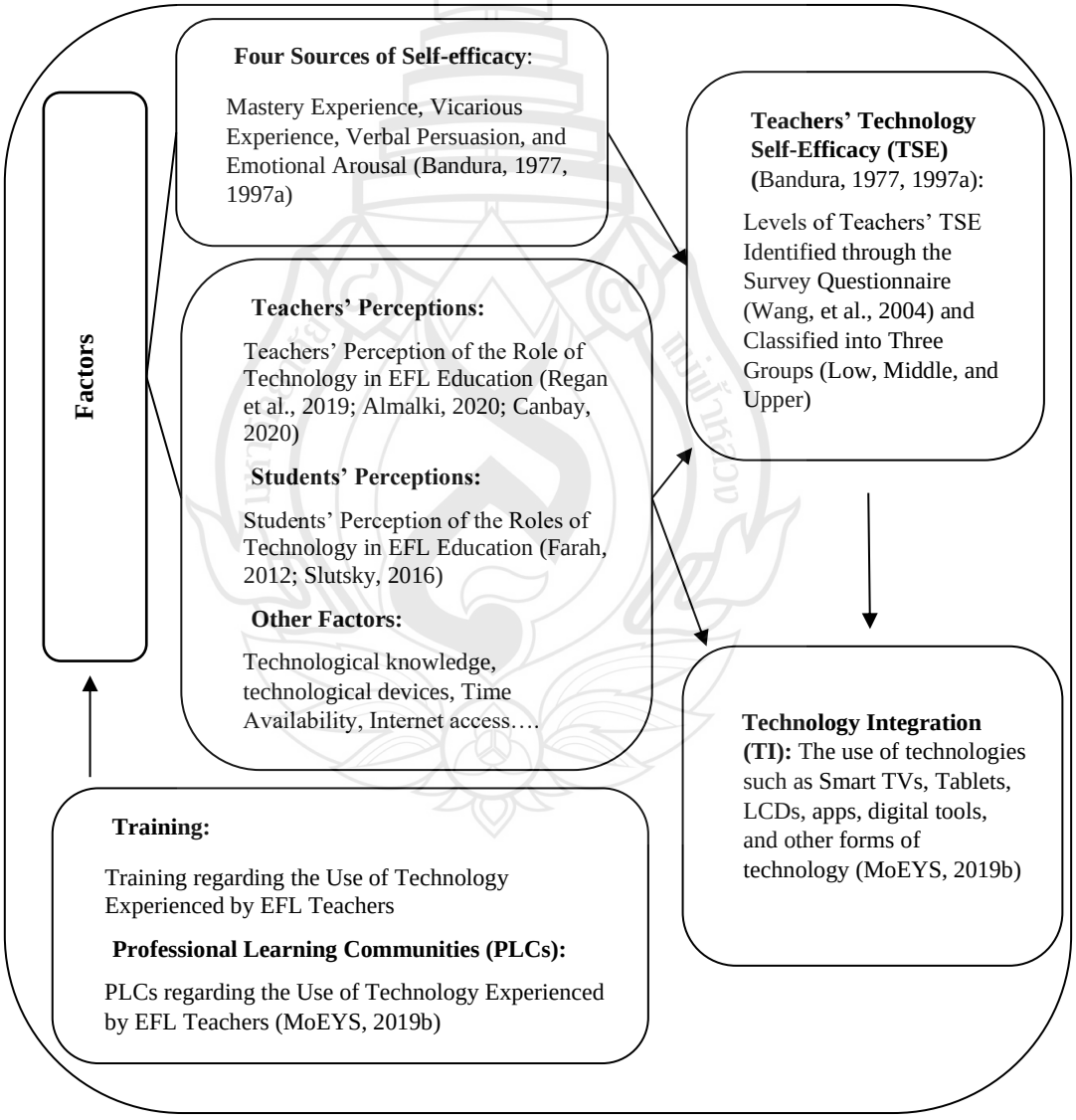


Figure 2.2 Proposed Research Conceptual Framework

Figure 2.2 presents the proposed research conceptual framework of this study. The identified factors including four sources of self-efficacy, teachers' and students' perception, and other factors such as their technological knowledge and devices, technological resources, time availability, and internet connection serve as the independent variables because they could affect the levels of teachers' TSE and TI. Therefore, teachers' TSE and TI serve as dependent variables. In addition, the identified factors can also be dependent variables, which were influenced by training and PLCs. Similarly, the level of teachers' TSE also serves as the independent variable, which causes the outcomes in TI.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter provides an introduction to the chapter. The chapter also depicts the research design, which also briefly mentions the definition of the term research design followed by the research design employed in this study. In addition, the chapter presents the population and sample and the data collection procedure. After that, this chapter includes a description of the research instruments, namely the survey questionnaires, interviews, classroom observation, and document reviews. Then, the chapter presents the construction of instrument, validity and reliability, the data collection procedure, data analysis, statistical procedures, and ethical regulation. Role of the researcher is presented at the end of this chapter.

3.1 Research Design

The research design is the overall method the researcher employs to combine the various components of the study coherently and logically. According to Sahu (2013), the research design clearly explained the different steps to be taken during a research program to reach the objective of particular research. Succinctly, it is a method for determining the answers to research questions. In the field of social sciences, there are two main research approaches: quantitative and qualitative research. A case study is one of qualitative design. This study employed a case study design. A case study method typically concentrates on a restricted geographical area or a small number of individuals. According to Gustafsson (2017), case studies naturally serve a dual purpose, functioning both as studies of individual units and as studies of a broader group of units and the conclusion of a case study might be either illustrative or confirmable. Likewise, according to Creswell and Creswell (2018), case studies are a type of inquiry design that is used in many disciplines, including assessment, in which the researcher

conducts an extensive investigation of a case that frequently involves a program, event, activity, process, or one or more persons. Gustafsson (2017) also added that the qualitative case study method necessitates instruments that enable the researcher to examine a holistic perspective within their respective contexts. Accordingly, a case study design perfectly matches this study as the current study intends to identify factors affecting teachers' TSE and TI within their schools that implement the NGS program. Various instruments were utilized to get the data to answer the research questions. A survey questionnaire was utilized to identify the participants and then, interviews, document review, and classroom observation were employed to identify the factors affecting teachers' TSE and TI.

3.2 Population and Samples

The procedure of selecting participants is one of the most crucial parts of organizing and developing a research project and is frequently harder and more involved than it may first appear (Marczyk et al., 2005). However, Creswell and Creswell (2018) noted that a qualitative study did not require random sampling or selection of many research participants and sites. In other words, the researcher could have his purpose in selecting the number of participants, sites, or other documents that best help the researcher answer the research questions. There are seven NGS public secondary school sites across the kingdom of Cambodia. NGS is the new reform school launched by RGC through MoEYS. In the current study, two NGSs were selected and the reason why these two schools were selected was that these two schools started implementing the NGS program in the same year. In NGSs, all teachers from other public schools can apply for a job as a teacher with NGSs through interviews. If they successfully pass the interview, they receive pre-service training regarding NGS policy, teaching methods, and using ICT in teaching and learning. Teachers who are working with the NGS program are encouraged to apply technology and each teacher receives a laptop from the program.

Since the study focused on teachers' TSE in the context of teaching and learning English at two NGSs, all EFL teachers (N=16), 10 from school A and the other 6 from

school B were selected in this study. Additionally, NGSs receive technical support from KAPE (Kampuchea Action to Promote Education), a Non-Government Organization (NGO), The ICT Team Leader from KAPE who played a role in training NGS teachers was also invited to be interviewed to collect the data regarding the PD training that KAPE provided to the teachers. Because the teachers were divided into three groups based on their TSE level, one class of students studying with each teacher from each group was selected to survey their perceptions of TI in their English class.

3.3 Research Instruments

This study employed a case study utilizing different research instruments to collect the data EFL from teacher participants. That is, the data was collected both quantitatively and qualitatively. Two types of research instruments namely quantitative instruments and qualitative instruments were utilized.

3.3.1 Quantitative Instruments

Regarding quantitative data, two types of survey questionnaires including a teacher survey and a student survey were employed. The teacher survey questionnaires regarding TSE employed in this study were comprised of two parts namely Part A, which is related to demographic information of the participants, and Part B, which is related to teachers' TSE. The early part was created by the researcher. In this part, all participants were required to provide their names to help the researcher identify the participants, but the participants' real names were not presented in the research findings. The later part regarding teachers' TSE was developed by Wang et al. (2004). However, this study adopted the new version of the survey employed in the study by Hershkovitz et al. (2023). According to Hershkovitz et al. (2023), the new version was more accurately aligned with contemporary terminologies and technological applications. For instance, the original item "I feel confident that I understand computer capabilities well enough to maximize them in my classroom" to the new version "I feel confident that I understand capabilities of technology well enough to maximize it in my classroom" (Hershkovitz et al., 2023, p.7). The survey consists of 21 statements as seen in Appendix A. The survey of teachers' TSE is created and tested for reliability and

validity by Wang et al. (2004). Each statement of this survey consists of a 5-point Likert scale ranging from strongly disagree to strongly agree.

The student survey questionnaires regarding students' perception of TI in learning English, which the researcher creates, consist of two parts. Part A requires students to provide the demographic information including name, gender, and grade they are studying. In Part B, the students are invited to express their perception of TI in their EFL classes. The survey includes close-ended questions and one open-ended question. The survey of close-ended questions as seen in Appendix B consists of 14 statements, which require the participants to rate the levels of agreement on a five-point Likert scale ranging from strongly agree to strongly disagree concerning the perceptions of the roles of technology in their EFL classes. One open-ended question required them to report the challenges they encountered when technology was integrated into their English classes.

3.3.2 Qualitative Instruments

Three types of qualitative instruments including interviews, document reviews, and classroom observation were employed to collect the qualitative data. Interviews including personal interviews and focus group interviews were employed in this study. According to Sahu (2013), personal interviews can be categorized as structured and unstructured interviews. A structured interview is concerned with the use of a set of predetermined questions with a standardized technique of data recording, whereas an unstructured personal interview method is distinguished by an investigator's freestyle approach to obtaining answers to questions as appropriate for the situation (Sahu, 2013). According to Stuckey (2013), interviews can be structured or semi-structured interviews. For qualitative research, the semi-structured interview is commonly acknowledged as the main tool for data collection. In a structured interview, the questions were asked strictly to regulate the information that the respondent provided. In a semi-structured interview, the researcher established the subjects to be covered and the order in which they would be covered, but the interviewee's responses defined the direction the interview would take (Stuckey, 2013). In this study, the researcher adopted semi-structured interviews; the researcher constructed teacher and ICT Team Leader interviews based on reviewing relevant literature.

Table 3.1 Personal Interview Questions

	Background Questions	**Background Information**
1.	How long have you been involved in teaching the English language?	Teaching Experience
2.	What is the significance of technology in education?	Technology in Education
3.	What kinds of technology do you usually use?	Type of Technology Used
	Focus Questions	Factors
4.	What are your opinions that the English class with technology integration is more effective than the class without technology integration?	Personal Perception
5.	How often do you use technology in your English class? Why?	TI/Personal Perception
6.	How do you learn to use technology in your English classes?	Mastery/Vicarious Experience/Training/PLCs
7.	What are the types of technology that you frequently use in your teaching (e.g. app, website)?	Mastery Experience
8.	How are those types of technology helpful/effective in promoting your teaching or your students' learning?	Personal Perception
9.	What are the challenges you face when integrating technology into your teaching? Why?	Lack of technological knowledge and resources/ Time Support…
10.	How do you feel when using technology in teaching English? Why?	Emotional Arousal
11.	How do you receive support from your schools/your colleagues and time in integrating technology?	PD training/PLCs/ Time support

Table 3.1 (continued)

	Background Questions	Background Information
12.	How do you describe the feedback you have received from your colleague, principal, and students in integrating technology into your teaching?	Verbal Persuasion
13.	What kind of training and professional learning communities do you think would help you a lot in integrating technologies? Why?	PD training/PLCs/ Mastery Experience/ Vicarious Experience
14.	What can you say about the opportunities you have to attend or participate in training and professional learning communities regarding the use of technology?	Time Support /Mastery Experience/Vicarious Experience
15.	How do you manage your time to apply what you have been trained (regarding the use of technology) in your class?	Role of PD training /Mastery experience

Teacher interviews consist of two parts as seen in Table 3.1 and Appendix C. The first part is the participants' background information regarding their experiences in teaching English (interview question 1), the significance of technology in education (interview question 2), and the types of technologies that they frequently use (interview question 3). The second part, which is the focus question part, consists of 10 questions (questions 4 to 15). As mentioned in the literature, the factors affecting teachers' TSE and TI include PD training, PLCs, their perception of the role of technology, and the time and support they received from their schools and colleague, so some interview questions addressed these factors. Likewise, since the theoretical framework of this study focuses on the self-efficacy theory of Bandura (1977) that encompasses four main sources (mastery experiences, vicarious experience, verbal persuasion, and physiological (emotional arousal) factors, some interview questions also address these four main sources.

Table 3.2 Focus Group Interview Questions

	Questions	Factors
1	What does technology offer to the field of education?	Personal Perceptions
2	What does technology offer to the field of English language education?	Personal Perceptions
3	What are the factors that make you feel more confident in integrating technology into your teaching?	General Factors
4	What are the factors that make you feel less confident in integrating technology into your teaching?	General Factors
5	What kinds of training and professional learning communities have positive and negative effects on the integration of technologies in teaching English?	PD Training and PLCs
6	Overall, what are your opinions toward the English class with technology integration that is more effective than the ones without technology integration?	Personal Perceptions

Focus group interviews with the teachers from each group with different levels of TSE were also used to expand the data on similarities and differences concerning the factors affecting teachers' TSE. Marczyk et al. (2005) said that focus groups could be a very helpful method for gathering people's opinions and concerns about specific problems, services, or products. In this study, focus group interview questions were used to expand the data from the personal interview. It also helped the participants to clarify and further explore their beliefs through group sharing. Moreover, the interview was also utilized to collect the data from the ICT Team Leader who is involved in training NGS teachers on technology use in class to answer research questions 1&3 as seen in Table 3.2 and Appendix C for interview questions and in Appendix D for question codes. According to Creswell and Creswell (2018), in the interview, the researcher can record information by using several ways such as handwritten notes,

audio, or video recording. In this study, both handwritten notes and audio recordings were utilized to make sure that no data from the interview was missed.

Classroom observation was also employed in this study to see if the factors raised by the teachers in the interview were reflected in the actual integration of technology in their classrooms. In addition, the classroom observation was also conducted to explore some additional factors that teachers did not raise in the interviews. Creswell and Creswell (2018) described qualitative observation as when the researcher uses writing notes to record the participants' behaviors at the research site. According to Creswell (2013), writing notes include short phrases, ideas, or essential concepts that occur to the researcher. The researcher can take notes of the participants' activities using some prior questions that they want to know and the records can come in an unstructured or semi-structured way (Creswell & Creswell, 2018). In this study, some data from interview questions were used as guides to construct semi-structured questions in the classroom observation protocol as seen in Appendix E.

Finally, qualitative documents were employed in this study to examine the training that schools provided to teachers and PCLs in which teachers participated. Qualitative documents can be public documents like official reports or private documents like personal notebooks and diaries (Creswell & Creswell, 2018). As aforementioned, all NGSs received technical support from KAPE. Thus, in this study, the official documents regarding PD training and other relevant documents about the implementation of PLCs were reviewed.

3.4 Construction of Instruments

The quantitative instruments in this study have been constructed for different purposes. Teachers' TSE survey was developed to measure the teachers' confidence level in TI (Wang et al., 2004). This survey consists of 21 statements as seen in Appendix A. In each statement, participants are invited to rate their levels of agreement in the columns of a five-point Likert scale option ranging from strongly disagree to strongly agree. The student survey consisting of 14 close-ended questions and 1 open-ended question is developed by the researcher based on the literature reviews about the

significance of technology in learning English. The survey includes three main aspects concerning the use of technology namely developing the English language, promoting student intercultural awareness, and promoting student engagement. The open-ended question required student participants to report the challenges they encountered when technology was integrated into their EFL classes.

Regarding the qualitative instrument, the interview questions, the researcher developed the questions based on the review of the literature regarding Bandura's (1977) self-efficacy theory. The interview includes both personal and focus group interviews with EFL teachers. The personal interview encompasses fifteen questions and the focus group interview encompasses six questions as seen in Appendix B. As already mentioned, personal interview questions address the teacher's experience with technology, their attitude toward technology, and the other related factors such as support, time, and their experiences in participating in training and PLCs affecting teachers' TSE and TI. In addition, some interview questions are constructed to address the four main sources of self-efficacy namely mastery experience, vicarious experience, verbal persuasion, and emotional arousal proposed by Bandura (1977, 1997). Three experts specializing in the field were invited to help check the interview questions including personal and focus groups and some questions were suggested for revision. Then, the pilot study was conducted with three teachers who were not involved with the main study. The purpose of the pilot test was to see if the participants would have some difficulties in understanding the questions and to see how much time would be spent for each participant. Focused group questions are developed to collect qualitative data from three groups of participants with different levels of self-efficacy.

3.5 Validity and Reliability

3.5.1 Teacher Survey

The survey apropos of teachers' TSE was adopted and adapted from Wang et al. (2004). This survey was first used in a similar study by Wang et al. (2004) to examine the level of teachers' confidence (self-efficacy) in integrating technology into their teaching. This survey was assessed for both content and construct validity and the

content validity of the instrument was determined to be persuasive after a panel of self-efficacy specialists reviewed the survey items. Cronbach alpha coefficients were calculated on pre- and post-survey data to verify reliability. The results revealed excellent reliability with Alpha coefficients of .94 in the pre-survey and .96 in the post-survey demonstrated, so this survey holds high potential for further studies (Wang et al., 2004, as cited in Farah 2012; Slutsky 2016). Wang et al. (2004) recommended using this survey for further research. These survey questionnaires have been used by later studies (Farah, 2012; Slutsky, 2016; Hershkovitz et al., 2023). As previously mentioned, this study adopted the new version of the survey employed in the study by Hershkovitz et al. (2023). A reliability test was conducted, yielding a highly satisfactory outcome (Hershkovitz et al., 2023).

3.5.2 Student Survey

The researcher surveyed students to examine their perception of technology in learning English. The questionnaires were created by the researcher; the validity and reliability of the questionnaires were measured. The five experts who experienced the quantitative study were invited to review the items in this set of questionnaires. The experts' rating agreement includes two scales (1=acceptable; 2= not acceptable). The experts were also invited to give comments if they rated any item in 1 indicating not acceptable agreement. After receiving the comments from the experts, the researcher decided to remove some items and revise some others.

Then, the reliability of the student survey also was tested. According to Muijs (2022), "Reliability, as conceptualized in quantitative research, has two main forms: repeated measurement and internal consistency" (p.59). Muijs (2022) also noted that repeated measurement refers to the ability to measure the same thing at different periods, and the researcher could simply utilize the test-retest approach with the same respondents to ensure that the answers they provide haven't changed too much. Concerning the time between two tests, Muijs (2022) suggested that if the researcher leaves too little time between the first and second tests, respondents may remember how they answered the first time and just give the same answer, but if the researcher leaves too much time between tests and retests, respondents' views or ideas may have actually changed. Therefore, in this study, thirty student participants who were not

included in the main research study were invited to participate in test-retest for over two weeks.

Table 3.3 Result of Test-Retest Reliability of Student Survey

Components	1st Survey		2nd Survey		Pearson *r*
	Mean	SD	Mean	SD	
Enhancing Language and Skills (ELS)	3.929	0.440	3.979	0.417	932**
Promoting Intercultural Awareness (PIA)	3.766	0.727	3.811	0.746	903**
Promoting Learning Engagement (PLE)	3.808	0.638	3.75	0.675	819**

Note **Correlation is significant at the 0.01 level (1-tailed)

As seen in Table 3.3, the result revealed high reliability, as the Mean scores of the first survey and the second survey of the three dimensions are almost the same and the result indicated a strong and positive relationship. Internal consistency reliability is only applicable to instruments with more than one item because it refers to how homogeneous the items of a test are or how effectively they assess a single component (Muijs, 2022). Since the student survey consists of three components and each component contains several items, thus internal consistency reliability was tested and Cronbach's Alpha was employed to analyze. Cronbach's Alpha is the most popular method employed to examine this reliability (Hinton et al., 2014). Hinton suggested four cut-off points for reliability:

0.90 and above shows excellent reliability

0.70 to 0.90 shows high reliability

0.50 to 0.70 shows moderate reliability

0.50 and below shows low reliability

Table 3.4 Data Regarding Reliability from Cronbach's Alpha of the Three Dimensions

	Numbers of Items	**Cronbach's Alpha**
Enhancing Language and Skills (ELS)	8	.68
Promoting Intercultural Awareness (PIA)	3	.86
Promoting Learning Engagement (PLE)	4	.89

Table 3.4 presents the result from Cronbach's Alpha regarding the three dimensions of the student survey about their perceptions of technology in English language learning. According to four cut-off points for reliability suggested by Hinton et al. (2014), the Cronbach alpha value of two dimensions, namely promoting cultural awareness and promoting Learning Engagement indicated a high level of reliability. However, the Cronbach alpha value of Enhancing English Language Learning was at a moderate reliability level. Thus, each item of the Enhancing English Language Dimension was rechecked.

Table 3.5 Result of Reliability about All Items of Enhancing Language and Skills

Three Dimensions	**Items**	**Cronbach's Alpha if Item Deleted**
Enhancing Language and Skills (ELS)	ELS 1	.86
	ELS 2	.66
	ELS 3	.64
	ELS 4	.61
	ELS 5	.59
	ELS 6	.59
	ELS 7	.56
	ELS 8	.59

Table 3.5 illustrates all items of the Enhancing Language and Skill dimensions. The data suggested that if Item 1 (ELS 1) of the Enhancing English Language dimension was deleted, the value of Cronbach alpha would be .86 which indicates high reliability, so Item 1 was deleted from this dimension. Thus, there are seven items of this dimension left.

Table 3.6 The Last Result Regarding Reliability of the Three Dimensions

	Numbers of Items Left	**Cronbach's Alpha**
Enhancing Language and Skills (ELS)	7	.86
Promoting Intercultural Awareness (PIA)	3	.86
Promoting Learning Engagement (PLE)	4	.89

Table 3.6 shows the last results of internal consistency reliability of the three dimensions and the value of Cronbach alpha value was loading from .86 to .89 indicating high reliability.

3.5.3 Interview and Observation Protocols

According to Guest et al. (2012), when doing qualitative research, validity is more important than reliability because qualitative studies rarely seek to replicate their results and if the data-gathering procedure is unstructured, the same results cannot be expected across individuals or the time. Guest et al. (2012) added that even semi-structured interviews that ask participants identical open-ended questions in the same order include inductive probing. That is, enhancing an instrument's structure helps participants compare answers, but probing questions can lead to conversations in various ways (Guest et al., 2012). Validity refers to the general concepts of "the credibility and accuracy of processes and outcomes associated with a research study" (Guest et al., 2012, p. 84).

To ensure the validity of this study, the researcher employed feedback, member checking, and triangulation. Concerning feedback, the researcher invited four different experts experienced in qualitative research to review the interview items and observation protocols. All four experts accepted, but three experts sent back the interview items and classroom observation protocol with comments to revise. Based on the expert comments, some interview items were revised. Then, a pilot study was conducted with two teachers of English who were not involved in the main study. The goal of the pilot study was to get feedback on how to enhance the interview questions and determine how long the interview would take. Following the pilot study, three questions were revised in response to participant suggestions. Concerning member checking, Creswell and Creswell (2018) stated that the researcher could determine the accuracy of the qualitative findings by sending the data (the specific descriptions or themes) back to participants to check whether those data are accurate. In the current study, after being reviewed, the data from the interview was sent to each participant to check and approve.

Apropos of the triangulation method, the researcher can claim the validity of qualitative data by converging several sources of data (Creswell & Greswell, 2018). According to Merriam and Tisdell (2015), regarding the use of triangulation, the researcher can employ three methods namely interviews, observations, and documents; for instance, the researcher can justify the data obtained from the interviews through the observation on-site or relevant documents. Merriam and Tisdell (2015) also claimed that triangulation could also be utilized to ensure both validity and reliability. In this study, the researcher collected data regarding the factors affecting EFL teachers' TSE through multi-sources such as interviewing the teachers and the ICT Team leader and conducting classroom observation. The data from these sources were used to expand and validate the data obtained from the interviews. The data regarding the factors affecting EFL teachers' TSE obtained from the interview were used as guidelines for conducting classroom observation. Four experts were also invited to review the themes for guiding classroom observation. The researcher reviewed documents related to training and PLCs in which EFL teachers have participated. The researcher invited the ICT Team Leader to help check the recorded data of the documents.

3.6 Data Collection Procedure

The data of this study were collected after COVID-19 (March and April 2023) through both quantitative and qualitative methods. The researcher adhered to the five main phases of the data collection procedure. The data from the survey were used to group participants into three groups namely Lower Group, Middle Group, and Upper Group. In phase II, the researcher employed the qualitative method through the interview. According to Creswell and Creswell (2018), for qualitative interviews, the researcher can conduct face-to-face interviews, telephone interviews, or engage in focus group interviews with participants. In this study, the researcher conducted face-to-face interviews. However, due to the difficulties in appointing all participants in focus group interviews, Google Meet was used as a tool for focus group discussion. Both personal interviews and focus group interviews addressed the factors affecting EFL teachers' TSE and TI. The teacher interviews were also conducted to explore how the identified factors are related to training and PLCs and how the teachers view their classes with TI. To collect the data regarding the factors related to training and PLC, the interview was also conducted with the ICT Team Leader who played the role in training teachers. Then, the researcher analyzed, concluded, and moved to phase III. In phase III, the researcher reviewed documents related to training and PLCs the EFL teacher experienced. Then, the researcher conducted the classroom observation in phase IV, to see if the factors raised in the interviews were reflected in the actual classroom and to explore the additional factors that the teacher did not mention in the interviews. In the final phase, the researcher also surveyed students' perception of technology in learning English and the challenges they encountered when technology was integrated.

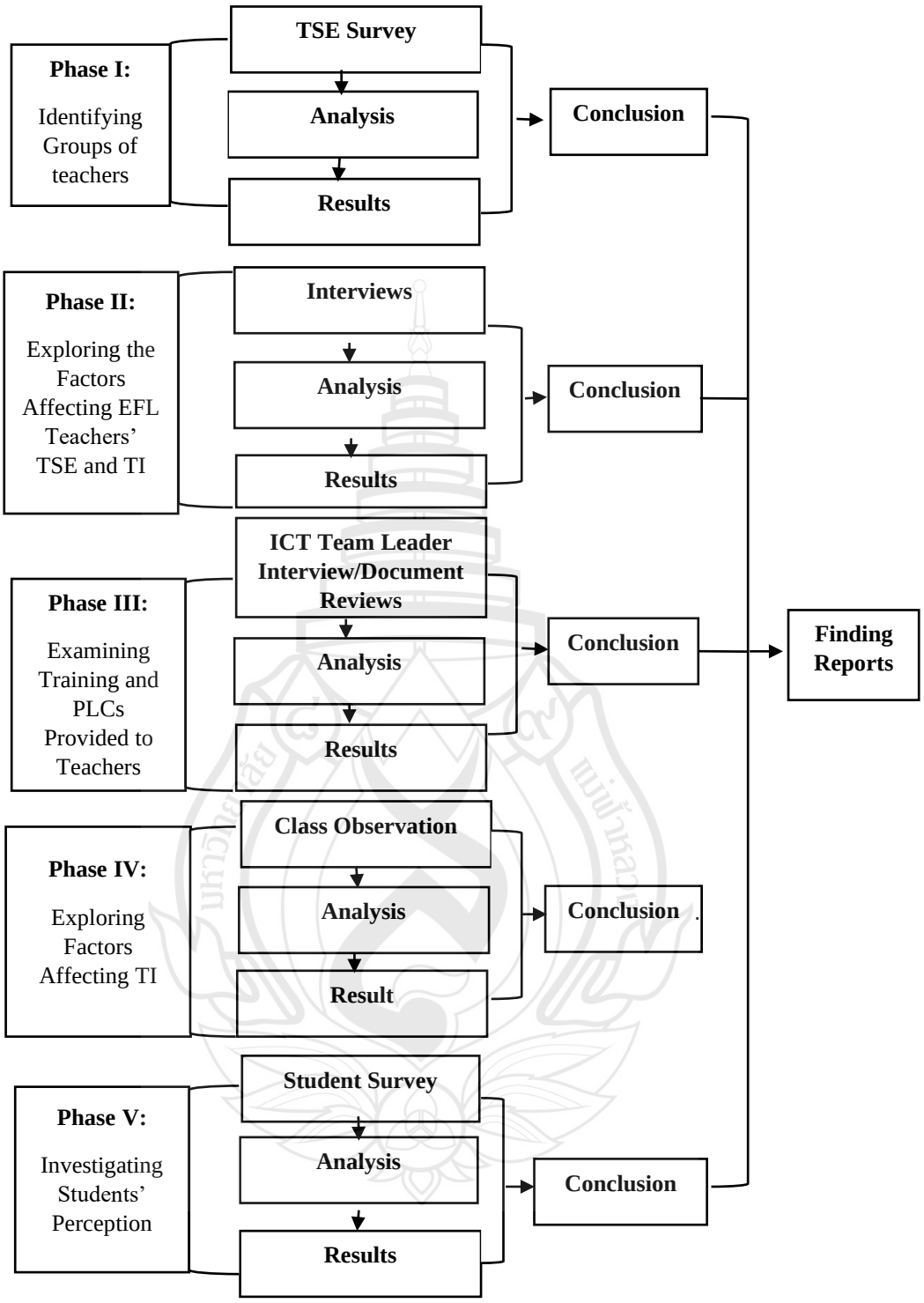


Figure 3.1 Data Collection Procedure

3.7 Data Analysis

Several methods were utilized to analyze the data obtained from different tools. The data obtained from the survey questionnaire vis-à-vis teachers' TSE were calculated on the total scores rated by the participants and then Interquartile Rang was adopted to group participants into three groups, namely Lower Group, Middle Group, and Upper Group. To analyze the data from interview questions and classroom observation, the researcher employed coding. Coding is the process of breaking down text or visual data into small categories, looking for evidence for the code in various databases utilized in the study, and finally assigning a label to the code (Creswell, 2013). In addition, Creswell (2013) noted that themes also known as categories are broad units of information in qualitative research that are made up of numerous codes combined to produce a single concept. In this sense, Creswell and Creswell (2018) stated that the researcher may use computer software to assist in coding or use manual coding, but manual coding is time-consuming, even for the data from a few respondents. The software gave the researcher a way to store, manage, and organize data electronically, but it did not take the place of the researcher's analysis of the data (Farah, 2012). Because the participants in this study are comprised of 15 teachers and one ICT team leader and the teacher interviews included both personal and focus group interviews, manual coding would take time. Thus, in this study, the computer software MAXQDA was utilized to store the qualitative data from the interviews and one open-ended question of the student survey and also assist in coding. Content analysis was employed to analyze the relevant documents regarding training and PLCs the teachers have previously received. SPSS (Statistical Package for the Sciences) was used to analyze the data from the student survey regarding their perception of technology.

3.8 Statistical Procedures

Different descriptive statistics were employed to interpret the data in this study based on research instruments and types of data.

Initially, the study started with the report of participants' demographic information obtained from teacher questionnaires and interview questions. Frequency count and percentage were utilized to interpret this data. Then, for the quantitative data from the teacher survey regarding the level of TSE, the Interquartile Range was adopted to classify teachers into three groups, viz. Lower Group, Middle Group, and Upper Group based on their rating scores of EFL teachers' TSE. Mean score, standard deviation, and frequency count were utilized to interpret the data from the student survey questionnaire concerning students' perception of technology in their EFL classes.

For qualitative data from the interviews, classroom observation, document reviews concerning the factors affecting EFL teachers' TSE and TI, and frequency were used to report the common themes found alongside some extracts of participants' responses. The data from one open-ended question in the student survey, both frequency count and percentage (%) count were utilized.

3.9 Ethical Regulation

The researcher obtained all official letters from Mae Fah Luang University requesting the experts to review student survey questionnaires and interview questions. The researcher received an approval letter from the MoEYS, Kingdom of Cambodia for data collection with EFL teachers and students in two public secondary schools. Then, he took the letter to two departments of education to get approval, as the schools selected are under the supervision of these two departments. Then, the researcher took the approval letter to the school selected to ask the school principals for data collection. The researcher then appointed all participants to explain the purpose of the study. All EFL teacher participants selected in the study are voluntary and thus they were invited to sign the consent form as seen in Appendix F. Since NGSs receive technical support from KAPE (Kampuchea Action to Promote Education), the researcher also appointed ICT Team Leaders from KAPE who involves training NGS teachers on using technology in teaching and learning. The researcher explained the purpose of the study and asked for cooperation in data collection concerning interviews and document

reviews about the training and PCLs that EFL teachers received. Moreover, to guarantee participants' confidentiality, their Pseudonyms were used to report the findings, and participants were informed that they could reject participating at any time they wished to. All data were confidentially kept in the folder with a password known only by the researcher.

3.10 Role of the Researcher

The researcher has worked as a school administrator at Cambodia's public secondary school implementing the NGS program. In 2020, the researcher was awarded the Thailand Scholarship to pursue this PhD in English for Professional Development at Mae Fah Luang University, Thailand. Because the researcher had acknowledged the significant roles of technology in teaching and learning English, and intended to help teachers integrate technology into their classroom instructions, the researchers decided to conduct a study on EFL Teachers' TSE and TI.

In this study, the researcher assumed some roles. To collect the data through classroom observations, the researcher adopted the role of a non-participant observer. During the interviews, particularly the focus group interview, he assumed the role of an observer while also directing and encouraging EFL teacher participants' engagement in active conversation.

CHAPTER 4

RESULTS

This study attempted to identify the factors affecting EF teachers' TSE and TI. The study also sought to see if there were different and similar factors based on the level of teachers' TSE. Moreover, the study aimed to examine if the training and PLCs in which EFL teachers have participated affected the identified factors. Finally, as the teachers' and students' perceptions of technology could also determine teachers' TSE and TI, the study sought to investigate teachers' and students' perceptions of TI in teaching and learning an English subject.

After highlighting the research objectives, this chapter presents the results guided by each research question. That is, it starts presenting the results concerning the level of teachers' TSE obtained from the survey. Then, the chapter reports the findings apropos of the factors affecting teachers' TSE and TI by providing the common themes found from the interviews. In addition, the chapter also presents the findings regarding the factors affecting TI from classroom observation and similarities and differences concerning the identified factors based on groups of teachers with different level of TSE. Finally, the chapter provides the results from student survey regarding their perceptions and challenges they encountered.

4.1 Results of Research Question One

What factors affect EFL teachers' TSE and TI?

Regarding this research question, the study first sought to explore the factors affecting teacher EFL teachers' TSE and TI. Teacher interviews including both personal and focus groups were adopted to collect the data. Moreover, the ICT Team Leader who played important role in training NGS teachers on the use of instructional

technology in teaching and learning was also invited to be interviewed. The data from the ICT Team Leader was utilized to justify the data obtained from the teacher interviews. Since the study also intended to investigate the similarities and differences concerning the identified factors based on the different groups of teachers with different levels of TSE, the survey questionnaire was adopted to identify the groups of EFL teachers.

Table 4.1 Groups of Participants from the Interquartile Range

Lower Group (25%)						**Middle Group (50%)**						**Upper Group (25%)**			
53	54	56	57	64	69	70	72	73	76	85	85	87	89	91	100

As seen in Table 4.1, survey questionnaires were delivered to all 16 EFL teachers who volunteered to participate in this study. To identify the group of teachers, the data from the survey questionnaire regarding the level of teachers' TSE was analyzed using the Interquartile Range (IQR). Sixteen values were obtained from sixteen participants and participants were divided into three groups including the Lower Group, the Middle Group, and the Higher Group. The range scores in the Lower Group started from 53 to 57; the range scores in the Middle Group started from 64 to 85; the range scores in the Upper Group started from 87 to 100. There are four participants in the lowest group, eight in the medium group, and four in the highest group. However, one teacher from the medium group who scored 73 did not participate in the personal and focus group interviews, so there are seven participants from the Middle Group.

4.1.1 Participants' Information

16 EFL teachers were invited to participate in the study and all 16 EFL teachers have completed the survey regarding EFL teachers' TSE. However, one teacher has opted out to participate in the interviews. The information of all teachers is presented as follows:

4.1.1.1 Teacher A

He has finished a Master's Degree and he has been a teacher of English for 9 years. He has worked with NGS for one year. For the scores concerning the level of technology self-efficacy, he earned 89 out of 105. Thus, he was placed in the Upper Group.

4.1.1.2 Teacher B

Teacher B has finished a Master's Degree. She has worked as a teacher of English for 4 years and has been employed as a teacher of English at NGS for 2 years. She has rated the score of technology self-efficacy at 85 out of 105. Therefore, she is in the Middle Group.

4.1.1.3 Teacher C

She has finished her Master's Degree and has worked as a teacher of English for 5 years and she has worked with NGS since she started teaching. She comes from the Lower Group because she has earned a rating score of 56 out of 105.

4.1.1.4 Teacher D

She has also finished her Master's Degree. She has been a teacher of English for 6 years and started working with NGS for 4 years. She rated the level of technology self-efficacy at 76 out of 105, so she is in the Middle Group.

4.1.1.5 Teacher E

He has finished his Master's Degree and he has been a teacher of English since 2014. At NGS, he has taught English subject for 4 years. His score of technology self-efficacy is 72 out of 105. He is in the Middle Group.

4.1.1.6 Teacher F

She has finished her Bachelor's Degree. She has taught English for 5 years and has been working with NGS for 4 years. She has earned the highest scores in technology self-efficacy. Her score is 100 out of 105, so she is in the Upper Group.

4.1.1.7 Teacher G

She has also finished her Master's Degree. She has been teaching an English subject for 5 years. She has worked with NGS since she started her career as a teacher of English. Regarding the level of technology self-efficacy, she rated the second lowest scores compared to the scores rated by other participants. That is, she has earned 54 out of 105, so she is in the Lower Group.

4.1.1.8 Teacher H

She has finished her Master's Degree. She has been a teacher of English for 4 years and she started working with NGS when she began her teaching career. She is in the Middle Group because her rating score is 64 out of 105.

4.1.1.9 Teacher I

She has finished her Bachelor's Degree. She also started working as a teacher of English with NGS when she began teaching English subjects. It has been 3 years of her teaching. She is in the Upper Group since her rating score is 87 out of 105.

4.1.1.10 Teacher J

Teacher J has finished his Bachelor's degree. It has been 6 years for him to be a teacher of English and he has been teaching English subjects with NGS for two years. He has rated the lowest score regarding the level of technology self-efficacy. His rating score is 53 out of 105 and he is in the Lower Group.

4.1.1.11 Teacher K

Teacher K has also finished her Bachelor's Degree. She has been employed as a teacher of English for 5 years, and at NGS, it has been 3 years since she started working as a teacher of English. Her rating score is 91 out of 105 and it is the second highest score. Therefore, she is in the Upper Group.

4.1.1.12 Teacher L

Teacher L has finished his Master's Degree. He started teaching English in 2012, so it has been 11 years and he has worked as a teacher of English subject at NGS for 4 years. His rating score of technology self-efficacy is 69 and he is in the Middle Group.

4.1.1.13 Teacher M

She has finished her Master's Degree. She has been working as a teacher of English for five years. With NGS, it is her first year. Concerning technology self-efficacy score, she has earned 70 out of 105 and she is in the Middle Group.

4.1.1.14 Teacher N

She has finished her Bachelor's Degree and she started teaching English in 2023, so it has been 9 years. At NGS, it is her second year. She has earned 57 out of 105. She is in the Lower Group.

4.1.1.15 Teacher O

He has finished his Master's Degree. He started teaching English in 2016, so it has been about 7 years. At NGS, he started in 2019, but he said that he spent a year off to pursue his master's degree, so it has been 3 years. His rating score is 85 out of 105 and he is in the Middle Group.

4.1.1.16 Teacher P

He has finished his Bachelor's Degree. He has been a teacher of English for years and has been teaching an English subject at NGS for 4 years. His rating score is 73, so he is in the Middle Group. Although he completed the survey, he refused to participate in the interview for personal reasons.

Table 4.2 Participants' Demographic Information

No	Teachers' Pseudonyms	Genders	Education Levels	Year(s) of Teaching Experience with NGS	Rating Score	Groups
1	Teacher F	Female	Bachelor's Degree	2 years	100	Upper
2	Teacher K	Female	Bachelor's Degree	3 years	91	Upper
3	Teacher A	Male	Master's Degree	1 year	89	Upper
4	Teacher I	Female	Bachelor's Degree	3 years	87	Upper
5	Teacher B	Female	Master's Degree	2 years	85	Middle
6	Teacher O	Male	Master's Degree	3 years	85	Middle
7	Teacher D	Female	Master's Degree	4 years	76	Middle
8	Teacher P	Male	Bachelor's Degree	4 years	73	Middle
9	Teacher E	Male	Master's Degree	4 years	72	Middle
10	Teacher M	Female	Master's Degree	1 year	70	Middle
11	Teacher L	Male	Master's Degree	4 years	69	Middle
12	Teacher H	Female	Master's Degree	4 years	64	Middle
13	Teacher N	Female	Bachelor's Degree	2 years	57	Lower
14	Teacher C	Female	Master's Degree	5 years	56	Lower
15	Teacher G	Female	Master's Degree	5 years	54	Lower
16	Teacher J	Male	Bachelor's Degree	2 years	53	Lower

Table 4.2 presents the summary of participants' demographic information that includes their pseudonyms, genders, educational levels, teaching experience, rating scores, and their groups from they are based on their rating score of TSE.

4.1.2 Factors Affecting Teachers' Technology Self-Efficacy (TSE) and Technology Integration (TI)

EFL teachers' TSE in this study refers to EFL teachers' confidence in their ability to integrate technology into their teaching. Regarding the factors affecting teachers' TSE and TI, the study employed both personal and focus group interviews. The themes that emerged through coding using MAXQDA software regarding the factors affecting teachers' TSE and TI found in this study were categorized into three dimensions: school-related factors, teacher-related factors, and student-related factors.

4.1.2.1 Teacher-related Factors

The emerged themes concerning teacher-related factors from personal and focus group interviews encompass their experiences including mastery/vicarious experiences, their technological knowledge, and knowledge and skills in technology-integrated classroom management.

1. Mastery/Vicarious Experiences: Experiences included mastery and vicarious experiences were found. Twelve EFL teachers mentioned the roles of mastery experience in increasing or decreasing their self-efficacy. They exhibited higher levels of confidence in utilizing technology that they had previously employed regularly while expressing lower levels of confidence in utilizing unfamiliar technology. For instance, Teacher G from the Lower Group stated, "When I use the technology that I have used very often, I feel confident, but I feel a bit uncomfortable when I am using technology that is new to my students and me. I am afraid that there may be some technical errors, which I cannot deal with". In addition, at least, two EFL teachers reported the roles of vicarious experiences in increasing their self-efficacy in integrating technology into their classes. For instance, Teacher F said that she sometimes observed other subject teachers if they successfully integrated technology in her class, she would also try to integrate it in her class:

At the beginning of the school year, it is hard to integrate technology, as students are not familiar with technology. I usually try to observe that if other teachers have tried to use technology that makes them quite familiar with it, I often take some time to use technology as well (Teacher F, Upper Group).

2. Technological Knowledge: Teachers' Knowledge of technology was another factor affecting EFL teachers' TSE and TI. Eleven teachers acknowledged that their knowledge of the particular technology would make them feel more or less confident in integrating technology into their classes. Good knowledge was the positive factor that increased the levels of teachers' TSE, while the lack of knowledge was the negative factor that decreased the levels of teachers' TSE. That is, if they have good knowledge of a particular technology, they tend to feel more confident in using it. For instance, Teacher H from the Middle Group said, "For me, I agree about what all teachers have mentioned…. The lack of knowledge in using it will make me feel less confident". Teachers with good knowledge of technology could positively influence TI. However, the ICT Team Leader reported that although most NGS teachers could use technology in their classroom instruction, some of them still lack technological knowledge "In fact, most teachers at NGS often integrate technology into their teaching and there are not many challenges. [However] some teachers lack knowledge in using technology... not only EFL teachers but also other teachers from other subjects".

3. Knowledge and Skills in Technology-Integrated Classroom Management: Finally, two EFL teachers Teacher F and Teacher I mentioned their knowledge and skills in classroom management as the factor. For instance, when asked to share the factors that could affect her confidence in using technology and TI, in addition to other factors, Teacher F also accepted that her knowledge and skills in classroom management as another factor, "It is also difficult to keep some students on track as they sometimes use their smartphones to check for something else..." (Upper Group). Likewise, Teacher I also accepted that when integrating technology into her teaching, she faced some problems in classroom management:

I have a problem with classroom management as well… I feel annoyed when I want them (students) to use their smartphones to search for lessons related to the lessons that I teach, but they don't. I mean they use their smartphone to chat with friends…" (Teacher I, Upper Group).

4.1.2.2 Student-Related Factors

Student-related factors include feedback, technological knowledge, possessing technological devices, engagement, and grade levels.

1. Feedback: The feedback from students regarding technology use in class could influence teachers' TSE and TI. Fourteen teachers accepted that their students' feedback played crucial roles in decreasing or increasing their TSE. For example, Teacher B from the Middle Group said "I mostly receive feedback from my students after some technology has been applied. When my students are satisfied with a particular technology, I feel more confident and I also consider applying it next time". When they received negative feedback, they showed less confidence in using it. For example, Teacher F said, "I usually receive feedback from my students. If they find the technology is complicated or difficult to use, they usually say it is boring and they don't like it" (Upper Group). The feedback from students also serves as a factor affecting TI. When asked whether she would stop using technology when receiving such feedback, Teacher F added, "I switch it or stop using it right away…. I don't feel confident in using it in that class again".

2. Technological Knowledge: Through the interviews, it was also found that students' knowledge of using technology was another factor affecting teachers' TSE and TI. The majority of students in class with good knowledge of technology served as positive factors, while the lack of technological knowledge among them served as negative factors affecting TSE and TI. In other words, the teachers seemed to feel more confident in integrating technology into the classes when most of the students were familiar with the technology they were supposed to use. In the personal interview, twelve teachers mentioned the knowledge of their students when asked what factors make them feel less or more confident in integrating technology into their English classes. It was also mentioned in two focus group interviews namely, Middle Group and Upper Group. In the focus group interview, Teacher E stated that (… students' lack of technological knowledge … would make me feel less confident in integrating technology" (Middle Group). In addition, most of them also acknowledged that it was the challenges that negatively affected their TI when students lacked technological knowledge. For instance, Teacher K said, "I usually think of students' knowledge [technological knowledge]. If the technology that I will use does not apply

to the level of students [students' technological knowledge), I will not use it in my class" (Upper Group). Likewise, Teacher O also raised the comparable challenges he encountered when integrating technology:

…other students don't have a Gmail account and some others have, but often forget passwords. Other students are illiterate in using technology, which is new to them. Some [others] can't use even Telegram because they have never used it before, so I spend time explaining it to them (Middle Group).

3. Possessing Technological Devices: Technological devices are integral when technology is supposed to be used in class. All users especially students must possess proper devices such as Tablets, laptops, or smartphones so that technology can be smoothly integrated into their classes. Meanwhile, the teachers would feel confident in using technology in their classes. Through coding from both personal interviews and focus group interviews, nine teachers acknowledged the lack of proper devices among their students would be a factor affecting their self-efficacy in integrating technology into their teaching. In other words, when their students didn't possess devices that support technology use, the teachers would feel less confident in incorporating it into their classroom instruction. In the personal interview, Teacher D from the Middle Group mentioned "I have faced some difficulties [when integrating technology] ……..some students do not have devices such as Smartphones. The technology such as Kahoot and Quizzezz, all students should have Smartphones". In addition, in the focus group interview, for instance, Teacher A stated, "Yes, good supporting materials such as students' devices are important when we use technology. I will feel more confident in integrating technology into my English classes if all of my students have devices such as smartphones" (Upper Group).

4. Engagement: The student engagement and interest observed by their teachers were also found to be the factors influencing teachers' TSE and TI. In the personal interview, eight teachers agreed that their students' engagement and interest were the determinants of TI in their ELF classes, as seen in the example given by Teacher I from the Upper Group "If my students enjoy it…., I want to use it for the other lessons and in other classes". In the focus group interview, when asked about the factors that make them feel less or more confident, they also shared similar ideas, as an example stated by Teacher H:

Yes, the levels of students' engagement and interest could also make me feel more or less confident in using technology. If most of my students are actively involved in learning, when I integrate technology, I am confident and happy to use it (Middle Group).

5. Grade levels: Students' grade levels were the last themes found regarding student-related factors. Students' grade levels were mentioned as a factor by three teachers. For instance, Teacher A said that he would feel less confident in integrating the classes with low-level students:

I think the level of students can be the problem because some students are young, especially [in] grades 7 or 8. They are not familiar with most types of technology, so I think I don't feel confident in using technology in classes with those groups of students (Upper Group).

Likewise, Teacher F also mentioned grade levels, which could make her decide whether technology should be used or not. That is, Teacher F said "My students in grade 7 are too young. At the beginning of the school year, it is hard to integrate technology..." (Upper Group).

For Teacher L, he said that some types of technology are not applicable to a particular group of students and thus he appeared not to feel confident in integrating them into his English classes:

Learning tools (Kahoot! Quizziz...) are more applicable for lower levels such as grade 7 or 8. However, I suggest other apps such as IELTS, TOEFL, and TED Talk [for upper graders). For instance, TED Talk is useful for higher-level learners because it can help students develop listening and speaking skills and vocabulary competency (Middle Group).

4.1.2.3 School-Related Factors

School-related factors include technological devices, internet access and electricity outages, time support, and feedback from school principals.

1. Technological Resources: Technological resources such as LCDs and computers were the main determinants of both EFL teachers' TSE and TI. All fifteen EFL teachers acknowledged that there were some technological devices such as LCDs and Laptops for teachers to use. For instance, Teacher J said, "Yes, the school has provided a computer and LCD for teachers. . ." (Lower Group). Yet, most ELF

teachers from both schools raised similar ideas that technological devices within their schools were not enough. For example, Teacher C said that. "There is no LCD in my English class, so if I want to use it, I need to take it from the administrative room. Because there are not enough LCDs, sometimes I cannot use them even though I want to.." (Lower Group). Teacher B also shared a similar idea:

However, for supporting resources, as I have said there is no LCD in my classroom. I need to invite all of my students to go to the school library because there are Tablets and Smart TVs in the library. However, I need to inform the librarian in advance because other teachers may also go (there to use those materials) (Middle Group).

ICT Team Leader also shared comparable information concerning the supporting technological resources the school provided to all teachers, but he admitted that although teachers could request what they needed, the request could be approved or not depending on the school budget, "The school provided each teacher with a laptop. Teachers can request what they need and the school or program will consider providing them based on the amount of budget for each subject".

Most EFL teachers perceived the lack of technological resources in their schools as a negative factor that contributed to the feeling of being less confident in integrating technology into their English classes. In the focus group interview, they also shared common ideas regarding the technological resources. For instance, Teacher N from the Lower Group stated, "Supporting resources are important. The lack of them will make me less confident to integrate technology into my class".

2. Poor Internet Access/Electricity Outage: Poor internet access/ connection and electricity outages were found to be the common themes that emerged from both personal and focus group interviews. The study found that a strong internet connection was the positive factor that could elevate the levels of teachers' TSE and positively affect TI, while a poor internet connection could decrease EFL teachers' TSE and hinder TI. In the personal interview, thirteen teachers complained about the internet connection in their schools, and the internet connection was also mentioned in all three focus group interviews. For example, in the personal interview, Teacher A mentioned "Most of my students use their internet on their smartphones. So, when all of them try to connect to the internet, it becomes so slow. In school, there is also an Internet network

but the speed is too slow to use some technology that needs a strong Internet connection such as Kahoot and Quizzizz" (Upper Group). In addition, they acknowledged that poor internet connection could make them feel less confident in their ability to successfully integrate technology into their EFL classroom instruction. For instance, Teacher N from the Lower Group said, "To me, the poor internet connection will make me less confident in using technology in my class...". Concerning electricity outages, six EFL teachers voiced concerns that frequent power outages and poor internet connection made them feel annoyed and this affected their TSE, as seen in the extract of Teacher O's excerpt, "Yes, I sometimes feel unfordable and annoyed when unexpected problems such as the lack of electricity and poor internet connection occur. This makes everything I have planned not go smoothly" (Middle Group)". Teacher G also shared the comparative opinion "The other problem can happen unexpectedly such as problems with electricity. It is annoying" (Lower Group).

3. Time Support: Time support for teachers was found a factor affecting TSE and TI from eight teachers. Teachers reported that they had enough time to integrate technology into their English class, as seen in what Teacher A shared "Yes, time availability is also important for integrating technology. If I have enough time to integrate technology into a particular lesson, I will integrate it. I also feel confident in using technology in my teaching" (Upper Group). In addition, most of them admitted that they had enough time to integrate technology. For example, Teacher F confirmed, "I don't think I have a problem with it. We have one hour-and-a-half lesson for a session, so I spend one hour on the course book and a half on other things such as games" (Upper Group). However, some admitted that they received less time for learning technology through training provided by other agencies. When asked about the time to learn technology integration, Teacher H said that when the training was provided by the school, it was not the problem. However, she admitted that she had difficulties attending the training provided by the outsiders, "About the opportunities? I don't think it is the main problem. The school has provided some training to all teachers. However, my teaching schedule doesn't allow me to attend the training provided by other agencies" (Middle Group).

4. Feedback from the School Principal: Leadership was also an important factor in educational organizations. The encouragement or feedback suggestions from school leaders or administrators are significant in building teachers' confidence in their ability to integrate technology into their classes. Three teachers accepted that feedback from other people such as their school principal could make them feel more confident in integrating technology in their teaching when asked what factors make them feel more confident in using technology in their classroom instruction. For instance, Teacher E reported that feedback from his school principal such as encouragement and motivation are also, important factors affecting their confidence in using technology, "…Encouragement from the school principal is the important motivating factor. I think I feel motivated and confident in using technology in my teaching when my school principal encourages and motivates me to use it" (Middle Group). However, when asked about the feedback from their principal regarding technology use in class, most teachers stated that they rarely receive such feedback. For instance, in the personal interview, Teacher E added, "The school principal suggests the use of technology, but doesn't make sure whether teachers use it or not. I mean there is no evaluation (assessment) to see the use of technology..." (Middle Group). The other teachers said that their school principal gave feedback concerning other school tasks, not technology use. For instance, Teacher H said, "I never receive any feedback from my school principal regarding technology integration. He has provided feedback about other things such as teachers' administrative work including timesheets and work plans" (Middle Group).

4.1.3 Factors Affecting Technology Integration (TI) through Classroom Observation

To identify the factors affecting TI in actual teaching practice, non-participant classroom observation was adopted to collect the data. In addition, aforementioned, classroom observation was conducted to verify the factors mentioned by the teacher participants in the interview and to identify if there would be any additional factors that were not found in the interviews. Due to the time constraint, six voluntary participants were asked for classroom observation.

Table 4.3 Participants for Classroom Observation

No	Teachers' Pseudonyms	Genders	Rating Score of TSE	Groups
1	Teacher F	Female	100	Upper
2	Teacher A	Male	89	Upper
3	Teacher D	Female	76	Middle
4	Teacher E	Male	72	Middle
5	Teacher C	Female	56	Lower
6	Teacher J	Male	53	Lower

Table 4.3 presents demographic information of all six teachers who were selected for classroom observation including genders, their rated score and the group they are from.

The observation lasted 20 to 30 minutes depending on the duration of technology use in class that the teachers informed. That is, classroom observation was finished when teachers moved to the traditional classrooms without TI. Three main themes that were in line with the ones found in the interview included students' technological knowledge, technological resources, and Internet connection. Students' family-related factors were the additional factors that were not found in the interviews.

4.1.3.1 Technological Knowledge: Students' knowledge of technology was found in the observation of two teachers, Teacher D from the Middle Group and Teacher A from the Upper Group. The first day of classroom observation was conducted in Teacher D's classroom. Teacher D taught seven graders and there were 34 students in her class. Teacher D had assigned her students to do a group presentation using Smart TV. There was only one Smart TV available in the school library and she invited her students to the library for a slide presentation. There were four group presentations and each group spent 15 minutes as known by her introduction at the beginning of her class, "Hello everyone! Today is your presentation of your homework assignment. I hope you all from the four groups will do a great job in your presentation. As you have already been informed, your presentation lasts 15 minutes, 10 minutes for your presentation and the other 5 minutes for Q & A session...". The student's

knowledge was found in classroom observation of Teacher D's class since students from two group presentations encountered problems in connecting the slide show from their device to Smart TV and they asked their teachers and peers to help. In addition, a similar factor was found in Teacher A's class. Teacher A taught 10 graders. There were 32 students in his class and Teacher A used the digital game Kahoot! to assess their students' performances in the present perfect tense. At least, two students were seen facing problems in joining Kahoot! because they asked to ask Teacher A to help. Teacher A also spent some time explaining them.

4.1.3.2 Technological Resources: Technological resources in classrooms that were found to be the factors affecting TI from classroom observation included students' technological devices and LCDs in their classrooms. To begin with, the lack of proper devices among students was found in the classroom observation of five teachers. For instance, Teacher E taught grade 9 and there were 30 students in his class. Teacher E also used the digital game Quizzizz to test his students' vocabulary. Before he started to play Quizzizz, Teacher E asked his students if they all possessed a smartphone with an internet connection. At least three students said they did not have a smartphone. Thus, Teacher E asked them to sit with others who possessed smartphones. The lack of LCDs in English class was also found in all six classroom observations. For example, in Teacher A and Teacher E's classes, when they used digital games such as Kahoot! and Quizzizz, there should have been a slide show to display the teacher's screen, but Teachers A and E used only their laptops. The lack of materials regarding LCDs was reported in the interviews.

4.1.3.3 Internet Connection: Internet connection was found in four classes of teachers. For example, it happened in Teacher C's class. Teacher C taught Grade 11 and there were 33 students in his class. The technology he integrated was also the digital game Kahoot! Teacher C used Internet access in school and when he started playing Kahoot! his students asked for the PIN and he told his students to wait for it as the internet was slow, "Wait, please! I was logging into Kahoot! because the internet is so slow...). In addition, students also encountered similar problems regarding internet connection and students used the internet on their phones. At least, four students complained that they were difficult in logging in to Kahoot! because the internet network in their phone was not quite good. In a similar vein, the internet connection

factor was found in Teacher J's class. Teacher J taught grade 8 and there were 31 students in his class. The technology he integrated into his class was Google Forms. Through the observation, several students had problems submitting their work through Google Forms they complained that it was a problem with the internet connection.

4.1.3.4 Student Engagement: Student engagement was also found in classroom observation of all six classes. Students showed high engagement in five classes, but in one classroom observation of Teacher D, students seemed to be more passive. As aforementioned, Teacher D who taught grade 7 used Smart TV in the classroom for her students 'assignment presentation. During their peer presentation, some students were using Facebook and others were talking. In addition, when their peer finished their presentation, a few of them raised questions. However, in other classes where teachers used digital games such as Kahoot! and Quizzizz, students showed high engagement as through observation all students enjoyed playing such games.

4.1.3.5 Students' Family-Related Factors: Students' family-related factors including parents' restriction on device use and delegation of household duty to their children were found in classroom observation of two teachers as an additional factor that was not mentioned in the interview. On the day of classroom observation, Teacher F taught language relevant to *traditional ceremonies celebrated around the world* and urged her students to investigate more on YouTube and Google Search at home. In response to her suggestion, at least one student complained that his parents did not allow him to use Smartphones at home. He said that his parents were afraid that he used his smartphone to play games or use Facebook chat which could affect his studies, "…when I am at home, I can't use my smartphone because parents, especially my father, don't allow me to…. He (father) said it affects my study". In addition, household duties were found to be the other sub-factor of students' family-related factors in Teacher J's class. As already said, Teacher J taught eighth graders, and he used technology like Google Search, Telegram, and YouTube in his lessons. Teacher J told his students to do more research on Google or YouTube. At least one student said she did not have much time because she had to help her parents with housework.

4.2 Results of Research Question Two

In what ways, can teachers' and students' perceptions affect EFL teachers' TSE and TI?

This research question also aimed to see in what ways the teachers' and students' perceptions can affect the EFL teachers' TSE and TI. An interview was adopted to collect the data from fifteen teachers and the interview included personal and focus groups. The survey questionnaire was adopted to collect the data from 354 students.

4.2.1 Teachers' Perceptions

Teachers' perceptions are integral as they can reflect their teaching practice. In the context of TI in teaching and learning, when teachers perceive technology as an important tool in teaching and learning, they try to use it in their teaching. The second research question of this current study sought to investigate teachers' perceptions of the roles of technology in teaching and learning English. The five common themes including promoting self-directed learning, promoting learning engagement, accessing resources, being less time-consuming, and promoting intercultural awareness were found in both personal interviews and focus group interviews.

4.2.1.1 Promoting Self-Directed Learning: Promoting self-directed learning was found in five teachers from personal interviews. When asked about the roles of technology in teaching and learning English, they thought that technology could help students learn by themselves when they are not at school. For instance, Teacher A said "And yes, students can also do self-study when they are not at school and they can research by themselves in addition to the contents in the course book they are using (Upper Group).

4.2.1.2 Promoting Learning Engagement: Promoting learning engagement was found as the emerged themes from nine teachers. They acknowledged that their class with technology is more interesting and engaging. For instance, Teacher K said:

"The class with technology integration can also attract students' interest and engage students in learning. Students are more active because the technology including Slide shows is interesting and games like Kahoot! is fun" (Upper Group).

4.2.1.3 Less Time-Consuming: Saving time was the emerging theme from ten teachers who mentioned it. They claimed that the use of technology could help them save time. For example, Teacher O confirmed, “It makes my teaching less time-consuming as I have just mentioned; I don’t need to spend much time writing on the whiteboard” (Middle Group).

4.2.1.4 Accessing Resources: Accessing resources that another theme regarding teachers’ perceptions of technology. This theme was found from the data of six teachers in both personal and focus group interviews. They perceived technology as significant in that it helped them find many teaching resources that could be used to improve their students’ learning. For example, when asked to share her opinion about the role of technology in teaching and learning English, Teacher B accepted that technology could enrich her teaching and improve student learning “Technology helps me a lot in finding teaching resources that can help improve my students’ learning (Middle Group). Similarly, Teacher I postulated that technology could help both teachers and students to access various resources that could support teaching and learning English:

“I think that technology is very important for English class. It is a source of teaching and learning resources because teachers and students can find a lot of good documents on the internet. This can make our teaching and learning more effective” (Upper Group).

4.2.1.5 Promoting Intercultural Awareness: Concerning raising intercultural awareness, at least one teacher mentioned it in the focus group interview. Teacher I said teachers could use technology as a tool to help their students learn about foreign cultures, “teachers can use technology to help students learn about the cultures of other countries…” (Upper Group).

Although EFL teachers acknowledged that integrating technology into their classroom instructions could improve their students’ learning when asked how often they integrate technology into their EFL classes, most of them reported that they did regularly integrate technology into their daily classroom due to the lack of supporting materials. For instance, Teacher H said, “I would say I don’t use it very often. It is about fifty percent. I want to integrate technology into my English class very often, but there are not enough supporting materials” (Middle Group).

In addition, those who reported that they used technology very often in their classroom instruction admitted that they used technologies such as Telegram and Facebook Messenger for only assisting in teaching and learning. That is, they did not use other types of technology due to the lack of supporting technological resources, as seen what Teacher D confirmed, "I always use technology such as Telegram but for other technologies, I do not use very often because there is no LCD in my English. It is difficult to use some other types of technologies without LCD" (Middle Group).

Classroom availability was another barrier that hindered EFL teachers from TI. Concerning this, Teacher A shared his difficulties in teaching which was challenging for TI as he often moved from one classroom to another that was available:

"Because technology such as Kahoot can be used to assess only students on only a small part of the lesson that students have learnt. My English class is not fixed like others' English classes. From week to week, I move to another subject classroom and I cannot use most of the materials in that class as those materials are only for another subject and are privately locked. If I wish to use some of the technological materials, I have to take them there and bring them back" (Upper Group).

4.2.1.6 Teachers' Perceptions as a Factor Affecting EFL Teachers' TSE and TI: EFL teachers' perceptions were also found to be the factor affecting EFL teachers' TSE from six teachers. When teachers perceived the value or usefulness of a particular technology, they endeavored to integrate it into their classes and when they showed a negative perception toward it, they did not try to use it in their teaching. That is, six teachers positively perceived technology as a useful tool in teaching and learning, resulting in feeling confident in integrating it into their classroom. For instance, Teacher N said, "What makes me feel more confident is that the use of technology in teaching can help students understand the lessons easily. It also helps me save time" (Lower Group). In addition, their perceptions affect TI, as seen in Teacher F's response "I feel great. I am so positive about technology. I want to use it as much as possible" (Upper Group).

However, when teachers negatively perceived some types of technology in terms of losing their privacy and being not effective in teaching and learning, they did not feel confident in integrating those types of technology into their classes. This has been seen in the excerpts of Teacher A and Teacher I:

"Personally, my privacy will make me less confident in using technology as well. When I use my PC to connect projectors to show lessons to my students, I also feel less confident because of the notifications from social media that I use such as Facebook Messenger and Telegram Chat. Students can see the messages on my PC" (Teacher A, Upper Group).

"The use of technology such as slide shows will make students more passive. Students don't have time to write down. They may passively listen to the PowerPoint presentation or just wait for PowerPoint shared. For example, when I let my students watch, videos related to the lesson, some students tend to be bored and sleepy. They pay less attention to the lesson" (Teacher I, Upper Group).

4.2.2 Students' Perceptions

Survey questionnaires consisting of 14 items measuring three dimensions, namely Enhancing Language and Skills (ELS), Promoting Intercultural Awareness (PIA), and Promoting Learning Engagement (PLE) were used to collect data from 354 students from 15 classes studying with 15 EFL teachers.

Table 4.4 Results Regarding Students' Perceptions

Dimensions	N	M	SD	Cronbach's Alpha
Enhancing Language and Skills (ELS)	354	4.0347	.4400	.858
Promoting Intercultural Awareness (PIA)	354	4.0895	.53269	.828
Promoting Learning Engagement (PLE)	354	3.9364	.55650	.838

As seen in Table 4.4, the results indicated that students positively perceive the roles of technology in learning English. That is, they rated the highest Mean (M) score in Promoting Intercultural Awareness (M=4.08; SD=.53), followed by Enhancing Language and Skills (M=4.03; SD=.44) and Promoting Learning Engagement (M=3.93; SD=.55).

Table 4.5 Results of All Items

No	Items	N	M	SD
ELS1	Technologies such as YouTube, Facebook, Kahoot! Quizizz and Search engines (e.g., Google, Yahoo) allows me to practice grammatical rules by doing free practice exercises.	354	4.10	.561
ELS2	Technologies such as online dictionaries, YouTube, and other websites (e.g. TED Talk, VOA Learning English, and BBC Learning English) help me improve my English pronunciation skills.	354	4.08	.587
ELS3	Technologies such as online dictionaries, YouTube, Facebook, Thesaurus, and other websites (e.g. TED Talk, VOA Learning English, and BBC Learning English) can help me improve my vocabulary.	354	4.10	.567
ELS4	Technologies such as YouTube, Facebook, and other websites (e.g. TED Talk, VOA Learning English, and BBC Learning English) can help me develop my speaking skills.	354	4.00	.667
ELS5	Technologies such as YouTube, Facebook, and other websites (e.g. TED, VOA Learning English, and BBC Learning English) can help me develop my listening skills.	354	4.08	.570
ELS6	Technologies such as Facebook, YouTube, Instagram, and other Search engines (e.g., Google, Yahoo) can help me develop my reading skills	354	3.92	.618
ELS7	Technologies such as Google Docs, Thesaurus, Grammarly, Writing Prompts, and Search engines (e.g., Google, Yahoo) can help me develop my writing skills.	354	3.95	.617

Table 4.5 (continued)

No	Items	N	M	SD
PIA8	Technologies such as YouTube, Facebook, Instagram, and Search engines (e.g., Google, Yahoo) allow me to learn about different cultures/traditions of different countries.	354	4.08	.629
PIA9	Technologies such as YouTube, Facebook, Instagram, and Search engines (e.g., Google, Yahoo) can help me learn the different kinds of foods, clothes, ceremonies, and so on of different countries.	354	4.12	.598
PIA10	Through technologies such as YouTube, Facebook, Instagram, Blogs, and Search engines (e.g., Google, Yahoo), I know the appropriate behavior accepted by a group of people from a particular country.	354	4.07	.626
PLE11	I enjoy learning the English language with technology.	354	3.98	.647
PLE12	The use of technology makes my English class more engaging.	354	3.95	.657
PLE13	I enjoy English language classes with technology integration.	354	3.85	.733
PLE14	I can choose the types of learning resources I enjoy with technology.	354	3.96	.674

Table 4.5 presents the details results concerning students' perceptions of technology in teaching and learning English. As seen in Table 11, the Mean (M) score of all items ranges from 3.85 to 4.12, which indicated above the medium levels of agreement of the 5-point Likert scale.

In the interviews, teachers mentioned the challenges associated with their students. Therefore, students were also invited to report the challenges they encountered when technology was integrated into their EFL classes. 251 out of 354 student participants

responded to this open-ended question. The data regarding the challenges raised by students were also used to validate the data from teacher interviews.

Table 4.6 The Challenges Students Encountered

Key Themes Found	F. Count	%
Poor Internet Connection	192	76.49
Lack of Technological Devices	186	74.10
Their Low Level of Language Competencies	98	39.04
Electricity Outages	94	37.45
Physical Harm	72	28.69
Classroom Atmospheres	67	26.69

Table 4.6 presents the results regarding the challenges students encountered when technology was integrated into their EFL classes. The challenges included poor internet connection or Wi-Fi, electricity outages, lack of devices including smartphones, Laptops, and computers, and their English language competencies such as problems with listening and difficult words when their teachers assign them to watch English videos. Some students also raised their classroom atmosphere (being noisy) and physical harm (Eye problems).

Students' Perception as a Factor Affecting EFL Teachers' TSE and TI: Although results from this survey revealed most students positively perceived the roles of technology in learning English, students rated the level of agreement, especially their engagement, slightly above the medium levels. This reflects that not all students actively engage in learning with technology. The result from the interview transcripts revealed that students' engagement was the factor affecting EFL teachers' TSE and TI. Even though they acknowledged that the English classes with IT are more engaging, some students seemed to be less engaged in learning activities when some types of technology were integrated into their EFL classes. The results also correspond to the result from classroom observation concerning the factors affecting TI in the actual classroom setting, which indicated that students demonstrated less engagement in class with the incorporation of technologies such as PowerPoint presentations. Moreover, in the interviews, teachers mentioned other

challenges or factors associated with students such as possessing devices and technological knowledge. In open-ended questions, students reported the same challenges. Therefore, factors hold a strong influence on EFL teachers' TSE and TI in their actual classrooms.

4.3 Results of Research Question Three

What similarities and differences exist among the groups of teachers with different levels of technology self-efficacy?

Regarding this research question, each identified factor namely school-related factors, teacher-related factors, and student-related factors was reexamined to see the similarities and differences based on the three groups of teachers with different levels of teachers' TSE. The similarities in this study were found when the teachers from all three, viz. Lower Group, Middle Group, and Upper Group shared similar or common ideas, while differences were found when the teachers from at least two groups shared different ideas.

4.3.1 Similarities and Differences in Teacher-related Factors

4.3.1.1 Technological Knowledge: Technological knowledge was found different across the three groups. Among eleven teachers, two teachers from the Lower Group, six teachers from the Middle Group, and three teachers from the Upper Group mentioned knowledge could affect their TSE and TI. That is to say, they accepted that with or without good knowledge of using technology, they would feel more or less confident in integrating technology into their teaching. When discussing technological knowledge in TSE and TI, most teachers from the Middle and Lower Groups accepted it as the key barrier that minimize the level of their TSE and hindered TI. For example, Teacher G said, "Yes, it is opposite to what I raised about what makes me feel more confident. A lack of knowledge… will make me less confident. Because without knowledge of using technology, we will face some difficulties when we integrate technology into our class" (Lower Group).

However, when asked if knowledge of using technology would make them feel less or more confident in using technology, teachers in the Upper Group although they acknowledged that good technological knowledge could make them feel more

confident, did not consider the lack of knowledge as key barriers or negative factors affecting their TSE and TI. For example, Teacher A from the Upper Group said, “I don’t think it makes me feel less confident because before using any technology in my class, I usually try first to make sure that I can use it”. Similarly, Teacher F also from the Upper Group stated, “Normally, if I learn new technology from training, I will use it right away after checking its functions. And then I will explore it along the way”.

4.3.1.2 Mastery/ Vicarious Experience: Differences were found in teachers’ experiences, which included mastery and vicarious experiences. Mastery experience was the factor found in the interview transcripts of twelve teachers, two from the Lower Group, seven from the Middle Group, and three from the Upper Group. They reported that they felt more confident in integrating the technology that they frequently used and less confident in using the new technology. However, teachers from the Upper Group confirmed that they could develop experience through this, whereas the teachers from the Lower and Middle Groups accepted as the key barriers. As seen in Teacher C from Lower Group said “I sometimes feel uncomfortable with technology that I never or rarely used. I am afraid that if I face a technical problem. I do not know how to deal with it. That would make my class boring”.

4.3.1.3 Knowledge and Skills in Technology-Integrated Classroom Management: Regarding knowledge and skills in technology-integrated classroom management, only two teachers, Teacher F and Teacher I, from the Upper Group mentioned their knowledge and skills in classroom management as the factor.

4.3.2 Similarities and Differences in Student-Related Factors

4.3.2.1 Technological Knowledge: Students’ knowledge was found to be the common emerged theme from the three groups. The teachers from all three groups share similar ideas when asked what challenges they faced when they integrated technology into their English classes. They mentioned their students’ technological knowledge as one of the challenges, as seen in what Teacher A from the Upper Group responded, “…some students don’t know how to install apps or programs that are supposed to be used in class”. In addition, when asked about what made them feel less or more confident in integrating technology into their English classes, they included their students’ knowledge of technology as one of the factors. If their students did not

have sufficient knowledge of the technology they were supposed to use in class, they would feel less confident in using it, as seen in what Teacher A added, “Students’ lack of technological knowledge. . . would make me feel less confident in integrating technology”.

4.3.2.2 Possessing Devices: Possessing devices among students was also found similar among the groups since nine teachers from the three groups shared common ideas. When asked about what challenges they encounter when integrating technology, teachers from the three groups mentioned their students’ devices, as seen in Teacher D, “Some students do not have devices such as Smartphones. The technology such as Kahoot and Quizzizz, all students should have Smartphones” (Middle Group). In addition, they acknowledged that the lack of technological devices among their students was the negative factor affecting the level of their confidence in using technology in their English classes, as seen in the excerpt of Teacher A “Good supporting materials such as students’ devices…..will make me feel more confident” (Upper Group).

4.3.2.3 Feedback: Students’ feedback was another common factor shared by most teachers from three groups. The positive feedback from their students served as a positive factors and negative feedback served as a negative factor influencing EFL teachers’ TSE. Four teachers from the Lower Group, six teachers from the Middle Group, and three teachers from the Upper Group reported that the positive feedback from their students served as a positive factor and negative feedback served as the negative factor affecting their TSE. For instance, Teacher O from the Middle Group stated, “Yes, I have received feedback from my students. For the technology that is new to them; they often say they don’t know how to play or use it. I feel hesitant to play or use it”. Likewise, Teacher J who is from Lower Group also said, “Some students give positive feedback, while others give negative feedback. I think of the majority of my students. If most of them enjoy it and they want me to use it for the next session, I will consider using it”.

4.3.2.4 Engagement: Student engagement was the other common factor shared by eight teachers from the three groups. They accepted that when their students actively engaged in learning with technology, they felt more confident in integrating it into their classes, as seen in the example of Teacher H from Middle Group who said

that the levels of students' engagement and interest could also make me feel more or less confident in using technology. If most of my students are actively involved in learning, when I integrate technology, I am confident and happy to use it".

4.3.2.5 Grade Levels: The difference in student-related factors in grade level was found both across the groups and in the same group, as three teachers from two groups, one from the Middle Group and the other two from the Upper Group perceived students' grade level as a factor. That is, as mentioned in research question one, Teachers A and F from the Upper Group and Teacher L from the Middle Group shared a common idea concerning student-grade level determining their TSE.

4.3.3 Similarities and Differences in School-related Factors

Almost all sub-factors of school-related factors such as supporting technological resources, feedback from the school principal, and Internet connection/frequent electricity outages were found to be the common factors or similar factors shared by all fifteen teachers across the groups. Nevertheless, some differences were found in the same group.

4.3.3.1 Supporting Technological Resources: All fifteen teachers from both schools acknowledged that their schools provided some supporting resources. Howbeit, most of them admitted that they were not enough to help them to integrate technology into their English classes. In both personal and focus group interviews, they accepted that the lack of supporting resources was the negative factor that made them feel less confident in integrating technology into their teaching, as seen in the examples of three teachers from all three groups including Teacher C from Lower Group, Teacher E from Middle Group, and Teacher A from Upper Group:

"There is no LCD in my English class, so if I want to use it, I need to take it from the administrative room. Because there are not enough LCDs, sometimes I cannot use them even though I want to" (Teacher C, Lower Group).

"For supporting resources, the school provided a laptop, but now it is quite old. As I have said, there are not enough LCDs for teachers to use" (Teacher E, Middle Group).

"Schools do not have enough technological devices such as extension cords and LCDs…" (Teacher A, Upper Group).

In the focus group discussion, teachers from three groups accepted that the lack of supporting resources would make them feel less confident in integrating technology into their class, as seen in the excerpt of Teacher N who is from the Lower Group "…supporting resources are also important. The lack of them will make me less confident in integrating technology into my class".

Nevertheless, the difference was found in the same group. Teacher L from Middle Group thought that the school provided enough supporting technological resources that could support teachers' needs, "For me, the school has provided sufficient supporting technological resources such as LCD, computer and other materials we need" (Middle Group).

4.3.3.2 Feedback from the School Principal: The factor regarding feedback teachers received from their school principals regarding technology use was found similar across the groups and in the groups. Although teachers from the three groups acknowledged that the feedback from their school principal could also be a factor in making them feel more confident integrating technology into their pedagogical classroom instruction, they reported that they rarely received feedback from their school principal regarding TI in their classes. That is, the feedback was not really about technology use, as seen in the extract of Teacher L "I don't think it is feedback…my school principal usually asks us about materials in each class to check if there are any damages or any things we need" (Middle Group).

4.3.3.3 Internet Connection and Electricity Outages: Internet connection and electricity outages were also found to be the common factor among the three groups. Poor internet connection and frequent electricity outages were found to be common negative factors affecting Teachers' TSE and TI. To begin with, the poor internet connection was found as a negative factor affecting teachers' TSE and TI. In other words, teachers shared common ideas regarding internet connection in their schools. They reported that internet access in their schools was there for teachers, but all of them said that it was too slow to use some types of technology that needed a strong internet connection. In the focus group discussion, they also accepted that with or without strong internet would make them feel more or less confident in using technology. For example, Teacher E said, "For me, there is nothing different from what all teachers have said. If there is a strong internet connection that could support the

technology use…, I would feel much more confident in integrating technology into my English class" (Middle Group).

In addition, all six teachers from different groups, two teachers from the Middle Group, two teachers from the Upper Group, and One teacher from the Lower Group also cited the frequent electricity outage were the challenges and the factors affecting their TSE and TI. However, differences were also found in the same group, unlike others in Teacher K from the Upper Group, Teacher L and Teacher O from the Middle Group did not think of the main factor that could prevent them from TI. When asked to share the challenge in integrating technology into his EFL classes, Teacher L accepted that the challenges included unexpected problems such as internet connection and electricity outages, but internet connection seemed to be not the main barrier. He said, "Generally, I don't depend much on the Internet, so I download those videos that can be played offline, except for the problem with electricity (Middle Group). Likewise, Teacher K also mentioned conveying a comparable message, but when asked about her feelings when she faced such a problem, Teacher K said, "I feel worried that there may be a problem with the electricity and Internet connection. However, most of the time, feel comfortable and confident because I have prepared in advance (Upper Group). Teacher O also said, "Yes, [with] a good Internet connection, I don't feel worried about using the technology that needs an Internet connection. However, some types of technology don't need internet access (Middle Group).

4.4 Results of Research Question Four

In what ways, can the identified factors be related to training and professional learning communities?

Semi-structured interviews with all fifteen EFL teachers and one ICT Team Leader and document reviews were adopted to collect the data to answer this research question. Interview questions include the questions that allow the teachers to share PD training and PLCs that the school provided to them or ones they have experienced and how those training and PLCs were related to the identified factors. ICT Team leader

interviews and document reviews were conducted to validate the data from teacher interviews regarding professional training that the school provided to teachers.

Concerning the trainings, all EFL teachers reported that their schools provided both pre-service training and in-service training. When asked the support from the school regarding training, Teacher B said “The school has provided a Foundation Workshop for all new teachers. Teachers have been trained in some technology such as Kahoot! Quizizz and some others (Middle Group). In addition, the school also provided in-service training as seen in Teacher N’s statement, “The training such as Refresher Workshop conducted in school helps me a lot because it trains what I have forgotten and I have faced in my teaching. In the interview, the ICT Team Leader also reported similar information regarding the trainings provided to the teachers:

The school provides all teachers with pre-service training called Foundation Workshop. This Workshop is for all new teachers from all subjects including English. The training focuses on the new teaching methods and approaches. The training also includes technology in teaching and learning such as Microsoft Word & Excel, PowerPoint presentations, and digital tools for assessment.

He added that Foundation Workshop usually lasted 10 days, and for the last two days, the training focused on technology integration “It usually lasts 10 days and for the last two days, the training usually focuses on technology. For the other 8 days, the training focuses on new teaching methods and approaches.” In addition, when asked if the school provided in-service training to some EFL teachers, the schools provided the training on a particular teacher who was responsible for the particular program assigned by the school and teachers could share with other teachers through PLCs in school. For instance, he gave the example of the XReading program:

In-service training is provided to teachers of English training. For example, (training on) XReading is for the teachers who are responsible for leading students who are interested in joining this program. The teachers who receive this training can share it with other teachers through PLCs.

However, he admitted that such in-service training did not have (a) fixed schedule. Only pre-service training called Foundation Work for newly recruited teachers was mandatory:

Honestly, besides XReading, there are no fixed schedules for the training provided to EFL teachers. The school has only a formal training schedule for the Foundation Workshop. As I said, it is for all newly recruited teachers, not only for EFL teachers.

In addition, they participated in PLCs every week and they could share technology use in their class, as seen in Teacher F's response "We also participate in PLCs every week and we could share our experiences and the use of technology as well" (Upper Group). Likewise, the ICT Team leader also said "Besides the training that the school and the program provided to the teachers, the school requires teachers to organize weekly PLCs. Teachers can share and learn from each other about using technology in teaching and learning.

Regarding research question four which sought to examine the affiliation between the identified factors and training and PLCs, three identified factors namely teachers' technological knowledge, their experiences (mastery/vicarious) with technology, and time support were found to be related to both professional training and PLCs.

1. Training with Teachers' Technological Knowledge: Teachers acknowledged that the training aided them in enhancing their confidence levels in incorporating technology into their instruction, as seen in what Teacher C said, "For me, I feel more confident in using technology in my class when I get well-trained about that technology use..." (Lower Group). However, five teachers contented that the training is not sufficient for helping them to integrate technology into their English classes. As seen in the example given by Teacher A who said, "…schools provide some technical support. The school provided a Foundation Workshop to all new teachers. In addition, Teacher E stated that the training is quite limited and is a bit general for all subjects. In other words, it did not focus on specific subjects like English, "The support from the school about technology use is quite limited. If I want to apply use technology in my class, I need to learn or explore the training by myself. The school doesn't often provide training to teachers of English subjects" (Middle Group).

2. Training with Mastery/ Vicarious Experiences: The study found that training could also affect EFL teachers' mastery and vicarious experience. EFL teachers accepted that their prior experience with TI could boost their TSE, while the lack of it

could lower their TSE. The training could allow teachers to gain experience, which could make them feel more confident when integrating technology into their actual classroom instruction. For instance, when asked what makes her feel less confident in integrating technology into her English classes, Teacher M shared her opinion "Personally, the lack of experience in using technology will make me feel less confident in using it in my English class" (Middle Group). Yet, most of them reported that PD training within their respective schools did not allocate enough time to practice TI.

3. Training with Time Support: Teachers stated that they had time to attend the training in their schools, but had some difficulties in attending the training provided by the outsider because their teaching schedules were quite busy. In the personal interview, Teacher F raised her difficulty, "For the training, if it is provided by the school, the schools set a schedule for the day when we don't teach. It can be a challenge for me when I want to attend the training provided by outsiders" (Upper Group). In addition, at least, two teachers complained that the time for TI in the training was not enough. For example, Teacher A said, "I think the time for training teachers about technology in the Foundation Workshop is not enough. If I don't have some background knowledge of technology, I think it is hard to use it in my class" (Upper Group).

4. PLCs with Technological Knowledge: Regarding PLCs and teachers' technological knowledge**,** seven teachers in the personal interview acknowledged that PLCs helped them to get knowledge regarding technology use. That is, they accepted that their colleagues including teachers from English and ICT subjects were approachable when they asked for help with any technical problem, they faced regarding technology use. For instance, Teacher H said, "I can ask other teachers, especially ICT teachers for help regarding technical problems. In the English subject team, we share our experiences including technology as well as have peer teaching" (Middle Group). In addition, in all three groups, teachers mentioned that PLCs helped them to learn from each other. For instance, Teacher F stated:

"I have learned more from PLCs because each teacher from the English subject usually shares the new technology such as games and platforms they have learned from the training and their experience using that technology in their class. Before, I didn't know how to use Kahoot! and Zoom. Now, I can use these kinds of technology well in my class although I sometimes face some problems. In PLCs, I also

learn technologies such as Spreadsheets and Excel that are useful for my administrative tasks like recording student scores or other data, I find these very helpful for facilitating my administrative work. So, would say the PCLs that we participate in every week are useful to us" (Upper Group).

5. PLCs with Mastery/ Vicarious Experience: PLCs could affect EFL teachers' Mastery and Vicarious experience. That is, EFL acknowledged that the collaborative environments through PLCs within their schools played a significant role in helping them gain experience in using technology. They postulated that PLCs allowed them to learn and share experiences in using technology with other teachers, as seen in Teacher H's declaration, "I can ask other teachers, especially ICT teachers for help regarding technical problems. In the English subject team, we share our experiences including technology as well as have peer teaching" (Middle Group)

6. PLCs with Time Support: PCLs were also found to be related to the time support the teachers received. Concerning PLCs and time availability, teachers acknowledged that all members could share the technology used in PLCs. For instance, Teacher D acknowledged that she could learn and share her experience TI in PLCs "I also have a chance to learn the use of technology from my friends through PLCs in school. In PLCs, we are provided with a chance to share our experiences in using technology as well" (Middle Group). However, they confessed that they had less time to discuss the technology use because they normally spend time discussing other tasks assigned by schools, "For PLCs, we have focused more on other tasks provided by the school, so we don't have enough time to discuss the use of technology in our English class" (Teacher H, Middle Group). Likewise, teachers across all three groups also mentioned that they did not have enough time to discuss and share the technology used in PLCs. For instance, in a focus group, Teacher O mentioned that "In PLCs, we can learn from each other regarding technology use, but there is not enough time to discuss the technology because we have other agent tasks assigned by the school to discuss" (Middle Group).

In addition, the teachers were invited to share what they perceive as effective PD training and PLCs that could have a positive impact on their TSE and TI. Teachers' perspectives on effective PD training and PLCs would be crucial for improving prospective training in enhancing EFL teachers' TSE leading to TI in their English

classes. In a similar vein, their ideas of effective PLCs would inform each member of PLCs to consider improving if needed and help guide school leaders or administrators to build up suggested PLCs.

4.4.1 Effective Training

Three common themes were found from the data coding of both personal interviews and focus group discussions concerning EFL teachers' perceptions of effective training that could enhance their TSE and TI.

4.4.1.1 More Subject Focus: When asked about the effective training that would help them integrate technology into their teaching, five teachers perceived effective training as being more specific in terms of the trainees' needs and subject focus**.** For instance, Teacher H shared her experience in attending the training, "The type of training that helps me a lot focuses on specific technology because some training provides many technologies that I can't catch up. The trainer should select one good technology for teachers and show them how to use it" (Middle Group). In the case of Teacher B, she accepted that effective training should meet the teachers' needs regarding the subject taught, "I think some of the training seems to be more general. It is not specific to English subjects, so it is not useful for integrating it into teaching English" (Middle Group).

4.4.1.2 Hands-on-Experience: Teachers need practical experience in using technology to make them tech-savvy. Six teachers acknowledged that effective training allows the trainees to practice what they have been trained and the trainees could receive support and help from the trainer. For instance, Teacher N shared her opinion, "The effective training or the training that has positive effects on technology integration would be the one that allows the teachers to practice and help when teachers face the problem. This could encourage teachers to integrate what they have learned from the training" (Lower Group).

4.4.1.3 New Technology: Effective training should train the teacher on the new technology. Teachers wanted to attend the training that provided them with knowledge of new technology that they had never known before. In other words, if the technology that they are familiar with, they can explore more by themselves. That is,

three teachers suggested that effective training trains the teachers on the new technology. For example, Teacher L said:

"I think effective training is the type of training that provides me with something new that I have never known before. The Foundation Workshop provided by the school with the support of KAPE to all new teachers is useful for some teachers who are not familiar with some basic technologies. For me, it is not important as I have already known those basic technologies such as Microsoft Word & Excel, PowerPoint, Kahoot! and Quizzizz" (Middle Group).

4.4.1.4 Follow-up Technical Support: Teachers may face unexpected problems when they try to integrate technology into their actual classrooms after the training. Thus, for effective training regarding TI, teachers need follow-up technical support after the training. When asked to share the characteristics of effective training for TI, four teachers have indicated that the trainer should follow up with the trainees even if the training has finished. This is due to the possibility that the trainees may encounter some difficulties while incorporating technology into their actual classrooms. Concerning this suggestion, Teacher E discussed his experiences after attending one training:

The trainers should follow up with the trainees if they have faced any problems. I would say the training called Open Program provided by the US embassy is effective. The program ended, but they have a group for teachers to ask regarding what they have been trained in (Middle Group).

4.4.1.5 Sufficient Time: In training, teachers also need time to learn and practice technology use in their classroom to make them feel more confident when integrating into their actual classrooms. In other words, the training should provide teachers (trainees) with sufficient time to acquire the knowledge of TI. Three teachers also suggested that effective training should have enough time for teachers to catch up on the content. For example, Teacher I said:

"Moreover, the training should be long enough for teachers to acquire the knowledge. I have joined a lot of training and some training lasts only one or two days. I could only catch on the surface. I couldn't integrate it into my teaching" (Upper Group).

Likewise, Teacher M shared her experience in attending the training “I used to attend the training and I was interested in some apps from the training, but because the training was short and I didn’t have enough time to ask the trainees. I haven’t used those apps till now” (Middle Group).

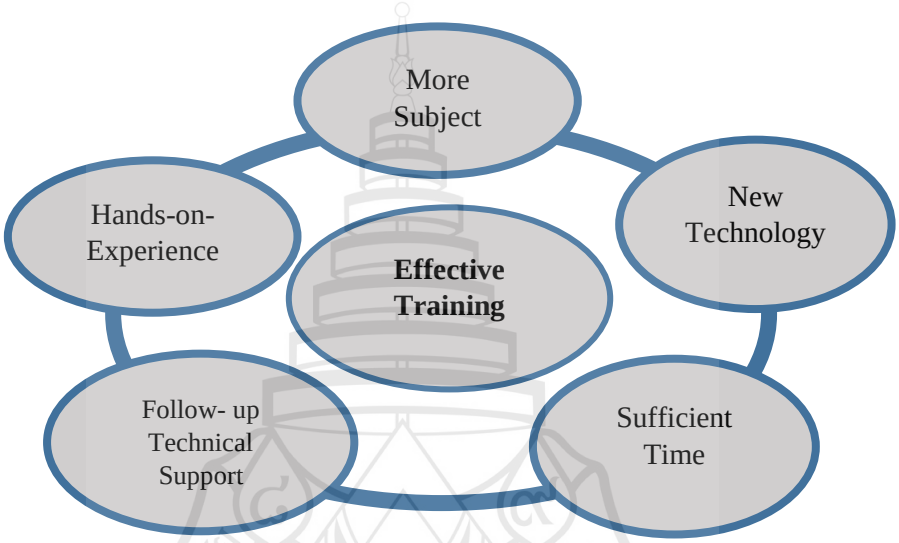


Figure 4.1 The Components of Effective Technology Training

Figure 4.2 provides a concise overview of the key component of effective PD training for TI in EFL classes based on the findings, as proposed by EFL teachers including five dimensions namely follow-up technical support, hands-on experience, more subject focus, new technology, and sufficient time.

4.4.2 Effective PLCs

When asked to share the effective PLCs that could improve TI in their EFL classes, they have already mentioned their school's PLCs were somewhat effective in terms of having the chance to learn new technology applicable to EFL classes and being able to help each other with TI issues, as they are from the same subject area. However, most of them suggested that effective PLCs should encompass two other related aspects.

4.4.2.1 Allocated Time: Allocating time for teachers to discuss and learn technology use in PLCs is at play in effective PLCs concerning TI. Nine EFL teachers suggested that for effective PLCs, there should be increased time to facilitate the exchange and deliberation of technology integration within their English classrooms. For instance, Teacher O said:

"In PLCs [in our schools], we can learn from each other regarding technology use, but there is not enough time to discuss the technology because we normally have other agent tasks assigned by the school to discuss. So, I think for effective PLCs, we should have enough time for discussing and sharing technology in teaching and learning" (Middle Group).

4.4.2.2 Active Involvement: They suggested that for effective PLCs, all teachers should be actively involved in sharing their personal experiences in learning and using technology and providing others with practical experience using technology and assistance. As an illustration, Teacher A responded, "For effective PLCs, all members should try to share the technology they have learned from the training and let each teacher practice to help them integrate that technology effectively into their teaching" (Upper Group).

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APPENDICES

APPENDIX A

SURVEY QUESTIONNAIRE: TEACHER TECHNOLOGY SELF-EFFICACY

These survey questionnaires consist of two parts. In part A, you are invited to provide your demographic information including your name, sex, and years of teaching experience. Please be informed that your identification will be confidential since your name will not be presented in the research findings.

Part A: Demographic Information

1. Name: …….
2. Sex: ……..
3. Years of teaching experience …….. (e.g. 3 years, 5 years…)

Part B: Technology Self-efficacy

Directions: The study intended to find out how confident you feel about incorporating technology teaching and learning. By circling one of the five scales for each statement below, indicate your level of agreement.

Note: 5=Strongly Agree, 4=Agree, 3=Neither Agree nor Disagree, 2=Disagree, 1=Strongly Disagree

No.	Evaluated Items	Levels of Agreement				
		5	4	3	2	1
1	I feel confident that I understand the capabilities of technology well enough to maximize it in my classroom.					
2	I feel confident that I have the skills necessary to use technology for instruction.					
3	I feel confident that I can successfully teach relevant subject content with appropriate use of technology.					
4	I feel confident in my ability to evaluate technologies for teaching and learning.					

5	I feel confident that I can use correct terminology when directing students' technology use.					
6	I feel confident I can help students when they have technological difficulty.					
7	I feel confident I can effectively monitor students' use of technology for project development in my classroom.					
8	I feel confident that I can motivate my students to participate in technology-based projects.					
9	I feel confident I can mentor students in appropriate uses of technology.					
10	I feel confident I can consistently use educational technology in effective ways.					
11	I feel confident I can provide individual feedback to students as they use technology.					
12	I feel confident I can regularly incorporate technology into my lessons, when appropriate to student learning.					
13	I feel confident about selecting appropriate technology for instruction based on the curriculum.					
14	I feel confident about assigning and grading technology-based projects.					
15	I feel confident about keeping curricular goals and technology uses in mind when selecting an ideal way to assess student learning.					
16	I feel confident about using technology to collect and analyze data from student tests and tasks to improve instructional practices.					
17	I feel confident that I will be comfortable using technology in my teaching.					
18	I feel confident I can be responsive to students' needs during use of technology.					
19	I feel confident that, as time goes by, my ability to address my students' technology needs will continue to improve.					
20	I feel confident that I can develop creative ways to cope with system constraints (such as budget cuts or technology facilities) and continue to teach effectively with technology.					
21	I feel confident that I can carry out technology-based projects even when I am opposed by skeptical colleagues.					

APPENDIX B

STUDENT SURVEY QUESTIONNAIRES

Students' Perceptions of Technology Integration in their EFL Classes

These survey questionnaires consist of two parts. In part A, you are invited to provide your demographic information including your name, sex, and the grade in which you are studying. In part B, you are invited to express your perception of using technology in your learning. Please be informed that your identification will be confidential.

Part A: Demographic Information

1. Name: …….
2. Sex: ……..
3. Grade (e.g. grade 8)……..

Part B: Perception of Technology

Directions: Please rate your level of agreement regarding your perception of technology in your learning by circling one of the five scales for each statement below.

Note: 5=Strongly Agree, 4=Agree, 3=Neither Agree nor Disagree, 2=Disagree, 1=Strongly Disagree

No	Evaluated Aspects	Levels of Agreement				
	Enhancing Language and Skills (ELS)	**5**	**4**	**3**	**2**	**1**
1	Technologies such as YouTube, Facebook, Kahoot! Quizizz, and Search engines (e.g., Google, Yahoo) allows me to practice grammatical rules by doing free practice exercises.					
2	Technologies such as online dictionaries, YouTube, and other websites (e.g. TED Talk, VOA Learning English, and BBC Learning English) help me improve my English pronunciation skills.					

3	Technologies such as online dictionaries, YouTube, Facebook, Thesaurus, and other websites (e.g. TED Talk, VOA Learning English, and BBC Learning English) can help me improve my vocabulary.					
4	Technologies such as YouTube, Facebook, and other websites (e.g. TED Talk, VOA Learning English, and BBC Learning English) can help me develop my speaking skills.					
5	Technologies such as YouTube, Facebook, and other websites (e.g. TED, VOA Learning English, and BBC Learning English) can help me develop my listening skills.					
6	Technologies such as Facebook, YouTube, Instagram, and other Search engine (e.g., Google, Yahoo) can help me develop my reading skills					
7	Technologies such as Google Docs, Thesaurus, Grammarly, Writing Prompts, and Search engines (e.g., Google, Yahoo) can help me develop my writing skills.					
No	**Promoting Intercultural Awareness (PIA)**	**Levels of Agreement**				
		5	**4**	**3**	**2**	**1**
8	Technologies such as YouTube, Facebook, Instagram, and Search engines (e.g., Google, Yahoo) allow me to learn about different cultures/traditions of different countries.					
9	Technologies such as YouTube, Facebook, Instagram, and Search engines (e.g., Google, Yahoo) can help me learn the different kinds of foods, clothes, ceremonies, and so on of different countries.					
10	Through technologies such as YouTube, Facebook, Instagram, Blogs, and Search engines (e.g., Google, Yahoo), I know the appropriate behavior accepted by a group of people from a particular country.					
No	**Promoting Learning Engagement (PLE)**					
11	I enjoy learning the English language with technology.					
12	The use of technology makes my English class more engaging.					
13	I enjoy English language classes with technology integration.					
14	I can choose the types of learning resources I enjoy with technology.					

Open-ended question

Please list down the challenges you encounter when technology is integrated into your classes (e.g. Lack of technological knowledge, poor internet connection…)

……

……

APPENDIX C

INTERVIEW QUESTIONS

1. Teacher Personal Interview

Background Questions

1. How long have you been involved in teaching the English language?
2. What is the significance of technology in education?
3. What kinds of technology do you usually use?

Focus Questions

4. What are your opinions that the English class with technology integration is more effective than the class without technology integration?
5. How often do you use technology in your English class? Why?
6. How do you learn to use technology in your English classes?
7. What are the types of technology that you frequently use in your teaching (e.g. app, website)?
8. How are those types of technology helpful/effective in promoting your teaching or your students' learning?
9. What are the challenges you face when integrating technology into your teaching? Why?
10. How do you feel when using technology in teaching English? Why?
11. How do you receive support from school/your colleagues and time in integrating technology?
12. How do you describe the feedback you have received from your colleague, principal, and students in integrating technology into your teaching?
13. What kind of training and professional learning communities do you think would help you a lot in integrating technologies? Why?
14. What can you say about the opportunities you have to attend or participate in training and professional learning communities regarding the use of technology?

15. How do you manage your time to apply what you have been trained (regarding the use of technology) in your class?

2. Teacher Focus Group Interview

Background Interview Questions

1. What does technology offer to the field of education?

Focus Interview Questions

2. What does technology offer to the field of English language education?

3. What are the factors that make you feel more confident in integrating technology into your teaching?

4. What are the factors that make you feel less confident in integrating technology into your teaching?

5. What kinds of training and learning communities have positive and negative effects on the integration of technologies in teaching English?

6. Overall, what are your opinions toward the English class with technology integration that is more effective than the ones without technology integration?

3. ICT Team Leader Interview

Background Interview Questions

1. How long have you been involved in your career?

2. What are your opinions toward the use of technology such as Facebook, YouTube, Instagram, Google Search, and so on as an important role in education?

Focus Interview Questions

3. What are the roles the technology in teaching and learning English?

4. What kinds of support did the school provide to the EFL teachers to help them integrate such technologies into their teaching?

5. What are the challenges that the schools face in helping the EFL teachers integrate technology into their teaching? How do the schools deal with those challenges?

6. How often did the school provide technology training to the EFL teachers? Please provide brief details.

7. Besides training, how did the school help the teachers to learn the use of technology among their colleagues?

APPENDIX D

INTERVIEW QUESTION CODES

Teacher Interviews	
Research Questions	**Personal Interview Questions**
1	6, 9, 10, 11, 12 & 15
2	2, 4, 5, 7 &8
3	6, 9, 10, 11, 12 &15
4	13, 14, &15
Research Questions	Focus Group Interview Questions
1	3 & 4
2	1, 2 & 6
3	3 & 4
4	5
ICT Team Leader Interview	
Research Questions	Interview Question
1	3, 4 &5
4	6 &7

APPENDIX E

CLASSROOM OBSERVATION PROTOCOL

Teacher:

Observer:

Date:

Time Classroom:

Guiding Questions Regarding Factors Affecting Authentic Integration of Technology	**Researcher's Comments**
What type of technology (e.g. digital apps, websites…) do the teachers integrate in class?	
What types of devices (e.g. Smart TV, LCD, Tablets, and Smartphones) do the teachers use in class?	
What types of devices (Laptops, IPad/Tablets, and Smartphones) do students use in class?	
What are the barriers (such as teachers' and students' knowledge in using technology, technical error, internet connection…) that the teachers and students encounter?	
What are students' interactions (paying attention to the lesson, or interfering with their classmates...) in learning English with technology integration?	

APPENDIX F

CONSENT FORM

EFL Teachers' Technology Self-Efficacy and Integration: Case of New Generation Schools in Cambodia

Saban Bon

Doctoral Dissertation Research

School of Liberal Arts, Mae Fah Luang University

Introduction

You are invited to participate in the above research topic because you are a certified teacher teaching an English subject at the schools selected. This study is being conducted by **Saban Bon**, a Ph.D. candidate from the School of Liberal Arts, Mae Fah Luang University, Thailand. Please read this form and ask any questions you may have before agreeing to participate in the study. if you have questions later, you can contact at (+855)16928691 or email sabanbon50@gmail.com

Procedure

If you agree to participate in this study, I would like to ask you to:

- Complete the survey.
- Participate in personal and focus group interviews.
- Allow classroom observation.

The interviews and classroom observation will be scheduled at your convenience.

Risks and Benefits

Some parts of the questionnaires will focus on your identity and information that may make you uncomfortable. You are free to refuse to answer any questions.

You will not be paid for your participation in this study. However, you have a good opportunity to share your classroom experiences concerning technology integration. The study may inform your school administrators on how to help you integrate technology into your EFL classrooms.

Confidentiality

Your identity and personal information will be kept confidential. The data will be stored securely, and only the researcher will have access to the records because all data will be confidentially kept in the folder with a password known only by the researcher. In addition, your real names will not be reported in the findings.

Voluntary Participation

The decision to participate in this study is voluntary. There will not be any negative effects if you opt not to participate. Please be aware that you can withdraw at any time or refuse to answer any particular question.

Statement of Consent

I have read and understood the above information and consent to participate in the study.

☐ Yes, I agree to be recorded in the interviews.

☐ No, I do not agree to be recorded in the interviews.

☐ Yes, I allow classroom observation.

☐ No, I do not allow classroom observation.

_____ _____ _____ /_____ / _____

Participant's Name Signature Date

_____ _____ /_____/_____

Researcher's Signature Date

APPENDIX G

SAMPLE PERSONAL INTERVIEW TRANSCRIPT

Participant: Teacher A

Interviewer: Today is Thursday, March 23, 2023.

Interviewer: How long have you been involved in teaching the English language? How about with NGS?

Teacher A: Well. I started teaching English in 2013, so it has been around 10 years. With NGS, it is my first year.

Interviewer: In your opinion, what is the significance of technology in education?

Teacher A: I think technology is very important in the education field. It can help teachers in most parts of teaching. And yes, students can also do self-study when they are not at school and they can research by themselves in addition to the contents in the course book they are using.

Interviewer: What kinds of technology do you usually use?

Teacher A: I usually use Telegram and YouTube and for my study, I use Zoom. I also use Facebook Messenger for communication with my family members but not often.

Interviewer: What are your opinions that the English class with technology integration is more effective than the class without technology integration?

Teacher A: Using technology in teaching and learning is more effective. It is less time-consuming. However, when it comes to assessment, normal classrooms would be more effective. We cannot see students' actual abilities because spelling, for example, is automatically checked and corrected.

Interviewer: How often do you use technology in your English class?

Teacher A: Er..., I think it is about two or three times a month that I use technology in my English class.

Interviewer: Oh, it is not quite often. Why don't you use it very?

Teacher A: Because technology such as Kahoot! can be used to assess students on only a small part of the lesson that students have learned. My English class is not fixed like others' English classes. From week to week, I move to another subject classroom and I cannot use most of the materials in that class as those materials are only for another subject and are privately locked. If I wish to use some of the technological resources, I have to take them there and bring them back.

Interviewer: How do you learn to use technology in your English classes?

Teacher A: I learn [it] from the training provided by school. If I want to know how to use some other technologies for my English classes, I search for training about those technologies. I also learn from other teachers.

Interviewer: Oh! I see. Now, let's discuss the types of technology that you all use in your class**.** What are the common technological forms that you frequently use in your teaching (e.g. app, website)?

Teacher A: In my class, I use Telegram, Kahoot!, Quizzizz, BAND and some other type of technology.

Interviewer: How are these types of technology helpful/effective in promoting your teaching or your students' learning?

Teacher A: Most technologies I use are effective for teaching and learning. Telegram for example is easier to send and drop the document than other social media such as Facebook Messenger. For Quizzezz and Kahoot! they are fun tools because there are sounds that can attract students' interest.

Interviewer: What are the challenges you face when integrating technology into your teaching? Why?

Teacher A: Yes, there are some difficulties. Some students do not have devices with internet connection. Most of the students use their own internet on their smartphones. So, when all of them try to connect to the internet, it becomes so slow. In school, there is also an Internet network but the

speed is too slow to use some technology that needs a strong Internet connection such as Kahoot! and Quizzizz. Some students don't know how to install apps or programs that are supposed to be used in class. There is no LCD for the English class.

Interviewer: How do you feel when using technology in teaching English? Why?

Teacher A: I see myself feeling confident in using a particular technology I want to use. Because before deciding to apply it in class, I have already prepared. However, sometimes, I feel annoyed when facing unexpected technical problems such as electricity and internet connection.

Interviewer: How do you receive support from school/your colleagues and time in integrating technology?

Teacher A: Schools do not have enough technological devices such as extension cords and LCDs and as I said, the Internet network is not quite good. But schools provide some technical support. The school provided a Foundation Workshop to all teachers. However, the workshop focused on some basic knowledge of using some apps, platforms and other technology, which could be difficult for most teachers to able to use after the training. In school, there are also ICT teachers who can help when I and other teachers ask for help. I also learn using some technology from other teachers of English. In PLCs, we share with each other some websites, apps, and other tools that can help our teaching and student learning.

Interviewer: How about time? Do you think you have enough time to integrate technology into your teaching?

Teacher A: I think time is OK. I use technology mostly for assessing my student's learning performance and making my class more relaxed.

Interviewer: How do you describe the feedback you have received from your colleague, principal, and students in integrating technology into your teaching?

Teacher A: I receive feedback mostly from my students. Although they do not say anything, I know through their involvement and attention.

Interviewer: What kind of professional development training or professional learning communities do you think would help you a lot in integrating technologies? Why?

Teacher A: Yes, when my colleagues recommend using some websites or apps and I want to know how to use them, I usually go to YouTube and google to search for the way to use them. I think it helps me a lot. Effective training focuses on fewer trainees to allow for practice and questions.

Interviewer: What can you say about the opportunities you have in attending or participating in professional training and professional learning communities regarding the use of technology?

Teacher A: Actually, at school, there are two PLCs including PLCs among groups of teachers teaching the same subject and PLCs with all teachers, and are conducted every week. However, I don't think it is effective as PLCs mainly focus on administrative work assigned by the school, not on teaching and learning with technology. In addition, I want to spend time pursuing my degree on the weekend, but my teaching schedule also includes Saturdays. So, I think I have a problem with time as well.

Interviewer: How do you manage your time to apply what you have been trained (regarding the use of technology) in your EFL classes?

Teacher A: For the new technology I have never used in my class, I do the survey with my students first. If most of my students are ready, I will use it. If most of them do not know, I explain to them and try to send them a YouTube video about how to use it. For some technology that I have already used in my class, I use it again when my students are bored.

Interviewer: That's all. Thank you very much for your time.

APPENDIX H

SAMPLE FOCUS GROUP INTERVIEW TRANSCRIPT (MIDDLE GROUP)

Interviewer: This is a focus group interview conducted on Monday, March 27, 2023.

Interviewer: Let me begin with the first discussion question. What does technology offer to the field of education?

Teacher H: Yes, I already discussed this in the previous interview. Technology helps make teaching and learning more easily. Teachers and students can find many resources such as videos, texts, and so on.

Teacher E: I agree with the idea that technology helps the field of education. Students can access education from any place. Students in the countryside can have a chance to study the same as those in the city. They can learn online, for example. In addition, technology makes the class more interesting. Moreover, teachers can search for teaching resources that can help develop their knowledge as well.

Interviewer: OK, I get what you mean. How about other teachers?

Teacher B: I also agree with Teacher…[H] and Teacher…[E]. We can find a lot of teaching resources. And with technology, students search [for] more lessons at home or any place when they are not at school.

Teacher O: Yes, we all accept that technology plays an important role in the education field. Teachers and students can find many teaching and learning resources easily. Technology can also facilitate our teaching. For example, we can use devices such as PCs for storing our documents and we can use PowerPoint for presenting the lesson to our students. There are many other things that technology helps education sectors.

Teacher M: Yes, I think you all have already mentioned that it is easy and less time-consuming if we integrate technology into our teaching. Moreover, when we want to share our experience and resources with other teachers even globally, we need technology. That's all for my ideas. Let others add them if they have. Thanks.

Teacher L: For me, technology is important in education, especially inclusive education. Using technology can help students learn more by themselves when they are not at school. Teachers can also get their professional development with technology. In addition, our minister of education also encourages teachers to use technology, especially during Covid-19. Our country is a less developed country, so we need to learn from other countries. Technology can help facilitate this. In short, I totally what other teachers have raised and I just want to add my points. Thank you.

Interviewer: OK. Now, let's talk about technology in English class. What does technology offer to the field of English language education?

Teacher L: I think technology can help teachers and students. Before, teachers normally used only traditional teaching methods like grammar-translation methods because there is not any available technology that teachers can use. Now, teachers can use various teaching and learning styles with technology in their classes. Teachers may adopt Flip classrooms or Blended classrooms. Teachers can use videos from YouTube to let students learn before class. Moreover, many teaching resources teachers can find on the internet to develop language skills to help them use English well. Before, although students are at the intermediate level, they couldn't speak English. Now, even though they are in the lower levels, they can speak English because they can learn English with the help of technology. I mean students can practice the four skills although they are not in countries where English is used as the native language. I think it is a bit long, but I think these responses about what technology helps English class.

Interviewer: Thank you for what you have shared regarding students' four skill development. Students can imitate native speaking although they don't have a chance to study at their native countries of English. Right?

Teacher L: Yes. That's right.

Interviewer: Ok. How about other teachers? What are your opinions?

Teacher B: In my opinion, technology helps students learn English by themselves as Teacher [L] has said. Students can practice the four skills including reading, writing, speaking, and listening. There are different websites that can be helpful for students to develop a particular skill or knowledge such as grammar and vocabulary. Moreover, digital tools or games like Kahoot! and Quizzizz are also fun tools. Teachers can use these games to assess student learning performance and students can get results immediately.

Teacher H: I don't have much to add. For me, technology is important for all subjects, but for English class, it even offers more advantages. As we know, most documents use the English language which is easy for teachers and students.

Teacher L: For me, using technology in English can make teaching and learning more accurate. We may not be good at pronunciation. Technology can help us and make students learn English in a more standard way.

Teacher D: In my opinion, using technology in English class is not much different from other subjects. It helps teachers and students be ready before class. For example, teachers can prepare a lesson and send it for students to learn in advance and this can help teachers save time. I think that's all for me because, for other points, all teachers already mentioned.

Teacher O: I think technology is very helpful for teaching and learning English. Teachers can find many resources to help develop students' language skills. For example, teachers can find videos of native speakers on YouTube and other websites to let students practice listening and speaking skills.

Teacher M: Yes, I have joined Open Program related to using technology in teaching English as well. As all teachers have said, technology can help us teach pronunciation. As we all know that we are not native speakers, for teaching words or pronunciation; we need technology to help us. Moreover, it is also faster and more convenient. With technology, teachers and students can search for the meaning of words on the internet easily. For writing, technology such as Grammarly can help teachers correct students' mistakes automatically. Well, that's it. Thank you.

Interviewer: Ok. Thank you. I get it. What are the factors that make you feel more confident in integrating technology into your teaching?

Teacher M: I would say with a strong internet connection and sufficient knowledge of the technology I use, I would feel more confident in using technology in my class. Moreover, if the technology is helpful for my teaching and student learning, I am also excited about using it in my class. And the other thing is that, yes, I also feel more confident in the technology that I use very often and most of my students are familiar with.

Teacher H: For me, I also think that a strong internet connection and enough materials that support technology integration will make us more confident in using technology in my class. Yes, the levels of students' engagement and interest could also make me feel more or less confident in using technology. If most of my students are actively involved in learning, when I integrate technology, I am confident and happy to use it.

Teacher D: I also agree with what all teachers raised such as internet connection, knowledge of technology, and available materials. All of these can make me feel confident in using technology or want to use technology in my teaching. Moreover, for me, when my students enjoy the technology I use, I feel more confident in using it.

Teacher L: Yes, I agree. If I have good knowledge and most of my students have good knowledge of using technology, I can say I feel more confident in integrating technology into my class because I will not face many problems to deal with.

Teacher E: For me, there is not anything different from what all teachers have said. But I want to say that there is a strong internet connection that could support the technology use and if students engage in the class with the use of technology, I can say I feel much more confident to integrate technology into my English class. Yes, students' technological knowledge. Encouragement from the school principal is an important motivating factor. I think I feel motivated and confident in using technology in my teaching when my school principal encourages and motivates me to use it.

Teacher O: Yes, a good Internet connection, I don't feel worried about using the technology that needs an Internet connection. However, there are some types of technology that don't need internet access. So, I think good knowledge and experience in using technology will make me feel more confident. And, yes, it is right that enough supporting materials are also important factors that can make us feel confident in integrating technology into our class.

Interviewer: What are the factors that make you feel less confident in integrating technology into your teaching?

Teacher B: To me, if feel less confident in using the new technology. It can be new for either my students or me. I am afraid it will take time if I try to use the new technology in my class because I need to explain to my students how to use it. In short, technology literacy makes me feel less or more confident in using technology in my class.

Teacher E: For me, yes, it is similar to what makes me feel more confident. Not enough supporting resources and students' knowledge of technology use are also important. Students' lack of technological knowledge would make me feel less confident in integrating technology because

we cannot successfully and effectively use technology in our classes if most students cannot use it.

Teacher L: Well. I think if it is a new technology to me, it makes me less confident in using it in my class. For new technology, I will face technical problems that make me less confident in integrating it into my English class.

Teacher M: Personally, the lack of experience in using technology will make me feel less confident in using it in my English class.

Teacher D: I agree with Teacher.. [L] and Teacher..[M]. If it is new technology and I have less experience in using it, I will feel less confident.

Teacher H: For me, I agree with what all have mentioned about the new technology. The lack of knowledge and experience in using it will make me feel less confident.

Interviewer: OK. Now, move to the training and professional learning communities or PLCs that you have attended or participated in. In your opinion, what kinds of training and professional learning communities have positive and negative effects on the integration of technologies in teaching English?

Teacher E: The training that has a positive impact on technology use in English class must be more trainee-oriented or focus on specific technology for English class. For example, the Open Program is more specific to the English subject and I think it has a positive impact on technology use in EFL classes. For some training, the trainer seems to focus on technology for all subjects, so I don't think it is really helpful for English subjects. It wastes time because some teachers will not use it in their classes. However, in PLCs, we focus on the English subject, but we don't have enough time to practice.

Teacher B: For the training, I think some of the training seems to be more general. It is not specific to English subjects, so it is not really useful for integrating it into teaching English

Teacher L: For me, I rarely attend the training provided by schools or other agencies. Because I don't think it meets my needs. I often learn to use technology and search for training by myself and we can also learn technology through PLCs. It helps me more with technology use in my class.

Teacher M: Some training is short and there are many trainees, so the trainees don't have time to practice [using] the technology they are trained in. When it comes to classroom teaching, they will feel demotivated to use it. Moreover, the training focuses on the big picture and doesn't focus on specific ones that a group of teachers needs as Teacher.. [E] has just said. This is also related to the knowledge of the trainer who is not skillful enough. This makes teachers difficult to integrate into their classes. If the teachers try to use it in class, there will be some technical problems happening and this makes teachers less confident to use it later.

Teacher D: Like what Teacher.. [L] has said, searching for the training that meets our needs is more effective or has a positive impact on technology use in class. Some training trains us what we may not need, so it is not useful and we are not interested. As Teacher.. [M] said, if the training is too short and we are not clear, so we will not use it in our class. For example, I myself used to attend the training and I was interested in some apps from the training, but because the training was short and I didn't have enough time to ask the trainees. I haven't used those apps till now.

Interviewer: What about professional learning communities or PLCs you have participated in? Do they help you with technology integration? Why? Why not?

Teacher O: In PLCs, we can learn from each other regarding technology use, but there is not enough time to discuss the technology because we have other agent tasks assigned by the school to discuss. So, I think for effective PLCs, we should have enough time for discussing and sharing technology in teaching and learning.

Teacher B: Yes, I think PLCs help a lot with using technology. In PLCs, we seem to know what each member needs and we can help them because we are in the same context.

Teacher D: Yes, in weekly PLCs, we share technology use in English class, but not often because we don't have enough time for it as we focus on school administrative work that the school assigned for us to discuss.

Interviewer: Oh, I see. Overall, what are your opinions toward the English class with technology integration, which is more effective than the ones without technology integration?

Teacher B: Yes. The English class with technology integration is more effective Teaching in the 21st century needs technology. Although we may face some problems when we use technology in our class, it is important.

Teacher H: Yes, it is more effective because the class is fun and interesting.

Teacher L: For me**,** it is effective because the class is more active and collaborative.

Teacher D: We already discussed this, so I don't think there is something much to explain. It is more effective because it is fun and engaging. The class with technology integration is also a collaborative classroom

Teacher M: Yes, I agree with all teachers who said the class is fun and engaging. Moreover, teachers can save more energy and students become independent learners because they can search for lessons by themselves.

Teacher E: I don't have anything to add as all teachers have raised them all.

Interviewer: Now, it is the end of the focus group interview. I would like to say thank you to all of you for your time. Goodbye!

APPENDIX I

ICT TEAM LEADER INTERVIEW TRANSCRIPT

Interviewer: Today is Wednesday, March 29, 2023. How long have you been involved in your career as ICT Team Leader with NGS?

ICT Team Leader: I have worked as ICT Team Leader with KAPE to support NGS teachers for two years.

Interviewer: Oh, I see. What are your opinions toward the use of technology such as Facebook, YouTube, Instagram, Google Search, and so on as an important role in education?

ICT Team Leader: I think technology plays an important role in education in this modern world. It helps both teachers and students. Teachers can use technology to facilitate their teaching. And they can search for the documents they need. Students can also learn easily with technology. They can search for more information or learn alone when not at school.

Interviewer: OK. What are the roles the technology in teaching and learning English?

ICT Team Leader: As I have said, technology plays an important role in education**.** Not different from other subjects, technology is useful in teaching and learning English. Teachers can use technology such as digital tools, apps, social media, and websites to facilitate their teaching. Students can search for and improve their language knowledge through technology.

Interviewer: What kinds of support did the school or the program provide to the EFL teachers to help them integrate such technologies into their teaching?

ICT Team Leader: In fact, the school provides all teachers with pre-service training called Foundation Workshop. This Workshop is for all new teachers from all subjects including English. The training focuses on the new teaching methods and approaches. The training also includes technology in teaching and learning such as Microsoft Word & Excel, PowerPoint presentations, and digital tools for assessment.

Interviewer: How long does it take for the training? I mean Foundation Workshop.

ICT Team Leader: It usually lasts 10 days and for the last two days, the training usually focuses on technology**.** For the other 8 days, the training focuses on new teaching methods and approaches.

Interviewer: Ok, I get it. What about the specific training for teachers of English?

ICT Team Leader: In-service training is provided to teachers of English training about Xreading, but it is for the teachers who are responsible for leading students who are interested in joining this program. The teachers who receive this training can share it with other teachers through PLCs.

Interviewer: What are the supporting resources that the school provides to teachers to help them integrate technology into their teaching?

ICT Team Leader: The school provided each teacher with a laptop. Teachers can request what they need and the school or program will consider providing them based on the amount of budget for each subject.

Interviewer: What are the challenges that the schools face in helping EFL teachers integrate technology into their teaching?

ICT Team Leader: In fact, most teachers at NGS often integrate technology into their teaching and there are not many challenges. Some teachers lack knowledge in using technology. Some students didn’t have devices with an internet connection. These are not only EFL teachers but also other teachers from other subjects.

Interviewer: How do the schools deal with those challenges?

ICT Team Leader: The school provided the training to teachers and at school, there is a 21st-century library with Smart TV and Tablets that teachers and students can use.

Interviewer: How often did the school provide the technology training to the EFL teachers? Please provide brief details.

ICT Team Leader: Honestly, besides XReading, there are no fixed schedules for the training provided to EFL teachers. The school have only a formal training schedule for Foundation Workshop. As I said, it is for all newly recruited teachers, not only for EFL teachers.

Interviewer: Besides training, how did the school help the teachers to learn the use of technology among their colleagues?

ICT Team Leader: Yes. Besides the training that the school and the program provided to the teachers, the school requires teachers to organize weekly PLCs. Teachers can share and learn from each other about using technology in teaching and learning.

Interviewer: Now, the interview comes to the end. Thank you very much for your time.

CURRICULUM VITAE

CURRICULUM VITAE

NAME Saban Bon

EDUCATIONAL BACKGROUND

2018	Teacher with Higher Education Degree National Institute of Education (NIE), Cambodia
2016	Master's Degree in Education in Educational Administration and Leadership Royal University of Phnom Penh (RUPP), Cambodia
2010	Bachelor's Degree in Education Human Resource University (HRU), Cambodia

WORK EXPERIENCE

2022-Present	Associate Editor the Cambodian Education Forum (CEF)
2018- Present	School Administrator Prek Leap High School, Cambodia
2016-2017	Lecturer of English IIC University of Technology, Cambodia
2012-2016	Lecturer and Teacher of English Cambodian Youth's Future Institute (CYFI), Cambodia
2011-2012	Short- Course Teacher and Full-time Teacher of English Cambodia International Cooperation Institute (CICI), Cambodia
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