AN INVESTIGATION OF TECHNOLOGY INTEGRATION TO PROMOTE THAI EFL UNIVERSITY STUDENTS' CRITICAL THINKING SKILLS: A PHENOMENOLOGICAL STUDY

BY

SATHAPHON RUNGSAWANG

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF PHILOSOPHY PROGRAM IN ENGLISH LANGUAGE STUDIES
DEPARTMENT OF ENGLISH
FACULTY OF LIBERAL ARTS
THAMMASAT UNIVERSITY
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ENTITLED

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was approved as partial fulfillment of the requirements for
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Dissertation Title	AN INVESTIGATION OF TECHNOLOGY INTEGRATION TO PROMOTE THAI EFL UNIVERSITY STUDENTS' CRITICAL THINKING SKILLS: A PHENOMENOLOGICAL STUDY
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ABSTRACT

The study aimed to explore the essence of lived experiences of EFL university teachers' technology integration to promote Thai EFL university students' critical thinking skills. Furthermore, Thai EFL university students' perceptions towards learning with technology integration to promote critical thinking skills were investigated. A phenomenological qualitative research approach was implemented to conduct the present study. For selecting participants to provide their experiences of promoting critical thinking skills through English instruction with a wide range of technologies, a purposeful sampling technique was implemented. There were 16 EFL university teachers and 16 Thai EFL university students who were willing to participate in the study. To elicit teachers' and students' experiences, phenomenological semi-structured interviews and class observation were employed. The data derived from the interviews were transcribed and the field notes derived from the class observations were organized. The significant responses regarding promoting critical thinking skills with technology-implemented English language instruction were underlined and those significant statements were clustered into different units of meanings.

The results indicated that certain aspects of critical thinking skills were fostered through technology-implemented English language learning activities such as exploring more information, sharing thoughts and opinions, evaluating information,

and providing reasons to strengthen thoughts. Furthermore, those aspects of critical thinking skills were developed in certain English language skills with technology integration. Further results regarding problems and influential factors which affected promoting critical thinking skills with technology integrating into ELT were discussed.

Keywords: English language teaching, critical thinking skills, technology integration

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Sathaphon Rungsawang

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CHAPTER 1

INTRODUCTION

The aim of this chapter is to provide the fundamental information of the present study. It is divided into seven sections, including background and rationale of the study, statement of the problem, purposes of the study, research questions, scope of the study, significance of the study, and definitions of terms.

1.1 Background and rationale of the study

English language teaching (ELT) has played an important role in Thailand for centuries. It has initiated since the reign of King Rama III and has been continuously developed in terms of educational level, teaching methodology, curriculum and policy development (Ministry of Education, 1996; Wongsothorn, 2000). Currently, reforming the policies of ELT and other current essential skills was introduced and implemented in every Thai educational level. In 2014, the policy of ELT reform was launched and required for all schools at the basic educational level (Ministry of Education, 2014). In addition, the Office of Higher Educational Commission (2016) introduced the improvement policy of English standards at higher education that required all universities and colleges to enhance students' English language ability for academic and professional purposes as well as communication ability in English with working knowledge, and to assess students' English language proficiency with tests that are equivalent to CEFR level. Moreover, the Ministry of Education (2017) represented the national education plan (2017 - 2036) to frame the purposes and directions of the national education management. Three of several developing guidelines for achieving strategies of national education plan are emphasized on 1) to develop effective English language teaching to promote students' English abilities, 2) to encourage integrated learning to promote critical thinking, creative thinking, morals, ethics, values, multiple-cultural society, the sufficiency economy philosophy, and 21st-century citizens, and 3) to develop digital technology systems for education, instruction, and lifelong learning.

For the higher education context, there were several factors that influenced the higher education to respond to the future change. One of the particularly crucial factors was English language ability because it helps students to acquire more knowledge by

searching specific academic information through technology, to promote learning autonomy in the future, and to be accepted by Thai and foreign businesses (The Office of Higher Education Commission, 2018). It could be seen that the new national education plan and the educational reforms place a profoundly important emphasis on enhancing English language teaching in terms of curriculum, classroom instruction, assessment and evaluation, and teacher development. Furthermore, they foster using effective instructional methods to promote students' critical thinking skills and utilizing educational technology to improve students' language proficiency. As a consequence, the students accomplish remarkably on their academic and professional purposes and also become lifelong learners with 21st-century skills. As discussed above, ELT at the higher education level in Thailand is going to be improved according to the national education plan and the educational reforms; as a result, English courses in all universities were be recently redesigned to achieve purposes of those educational plan and reforms.

In addition, it is important to discuss current crucial 21st century skills, especially technology skills and critical thinking skills, because they are particularly beneficial for learners in the classrooms, the workplaces, and life. Furthermore, utilization of Technology and critical thinking skills have been discussed in Thailand's education context for more than two decades. According to National Education Act of B.E. 2542 (1999) in section 24 (Office of the National Education Commission, 1999), National Education Guidelines were provided to educational institutions and agencies to concern organizing the learning processes. Firstly, educational institutes should provide training in thinking process, management, how to face various situations and application of knowledge for obviating and solving problems. Furthermore, they should organize activities for learners to draw from authentic experience, drill in practical work for complete mastery, enable learners to think critically, and acquire the reading habit and continuous thirst for knowledge. They should enable instructors to create the ambiance, environment, instructional media, and facilities for learners to learn and be all-round persons, able to benefit from research as part of the learning process. In so doing, both learners and teachers may learn together from different types of teaching-learning media and other sources of knowledge.

Technologies, furthermore, are required to be integrated into the teaching and learning process (Office of the National Education Commission, 1999). In terms of learners, they have the right to develop their capabilities for the utilization of educational technologies as soon as feasible so that they have sufficient knowledge and skills in using these technologies for acquiring knowledge themselves on a continual lifelong basis. On the other hand, in terms of teachers, personal development for both producers and users of technologies for education must be developed so that they have the knowledge, capabilities, and skills required for the production and utilization of appropriate, high-quality, and efficient technologies.

Technology and critical thinking skills are still two significant skills which are included in a comprehensive strategic plan or National Strategy 2018 – 2037 for national development (National Strategy Secretariat Office, 2018). The plan has proposed the six primary strategies, including 1) national security, 2) national competitiveness enhancement, 3) human capital development and strengthening, 4) social cohesion and equity, 5) eco-friendly development and growth, and 6) public sector rebalancing and development. According to the third key strategy, Thai citizens are required to develop their logical thinking and 21st century skills, communication skills in English as well as a third language. To achieve those skills, the learning process must be improved to accommodate changes in the 21st century by encouraging lifelong learning and development. For these reasons, using technology and critical thinking skills for learning are extensively crucial skills not only for learners but also for teachers or even educators at national education level.

According to Thai Qualifications Framework for Higher Education (The Office of Higher Education Commission, 2009), technology and critical thinking skills are embedded in learning outcomes at different levels of qualifications which are divided into five domains, including 1) ethics and moral, 2) knowledge, 3) cognitive skills, 4) interpersonal skills and responsibility, and 5) numerical analysis, communication and information technology skills. In terms of undergraduate level, the learners are expected to enquire facts, comprehend and evaluate conceptual information as well as current evidence from various sources. These skills could relate to critical thinking skills. In addition, the learners are required to research and understand

problematic issues and utilize technology to collect, analyze, interpret, and consistently illustrate information.

The empirical evidence revealed that gaining accepted English proficiency and technology skills affected learners' future employment opportunities. According to Higher Education Statistics: Academic Year 2018 (Ministry of Higher Education, Science, Research and Innovation, 2019, p. 79), the first three special skills for the graduates who were employed included 1) special skills on using computers (41%), 2) other special skills (22%), and 3) special skills on foreign languages (20%). Furthermore, skills of the workforce that responded to the entrepreneurs' needs in Thailand were language skills and information technology skills (Ministry of Education, 2017). The survey results of workforce requirements of entrepreneurs exposed that Thai workers still possessed skills that were lower than the entrepreneurs' expectations, including foreign language skills, computer skills, mathematics skills, communication skills, management skills, and professional skills. It could be implied that not only technology competences, especially computer skills but also foreign language skills would impact learners' employment opportunities in the future. The following discussed two primary interests of the study, including technology integration and critical thinking skills in ELT.

A significant aspect of the present study was using technology in ELT. Technology integration can be called in different terms such as technology of instruction, technology-enhanced learning environment (TEL), and technology-enhanced learning and teaching (TEL&T), and it is also defined in various points of view. Technology integration is a particular systematic arrangement of teaching and learning events designed to put knowledge of learning into practice in a predictable, effective manner to attain specific learning objectives (Heinich et al., 1993). Other scholars defined integrating technologies as a process of utilizing technologies in teaching and learning activities. Shelly et al. (1999) suggested that it is the combination of all technology parts such as hardware and software together with each subject-related area of curriculum to enhance learning. Furthermore, it is using technology to help meet the curriculum standards and learner outcomes of each lesson, unit, or activity. Roblyer (2006) suggested that integrating technologies refer to the process of determining which electronic tools and which methods for implementing them are appropriate responses

to given classroom situations and problems. It is also defined as integrating the use of digital technology into the learning and teaching process to improve the quality of learning (Law et al., 2016). Innovative technologies which were basically utilized for instruction could be categorized into board ideas, namely hardware and software. Hardware refers to digital tools such as laptops, microphones, speakers, projectors, and screens. In contrast, software refers to online and offline applications, media, and web resources based on teachers' purposes, including delivering the lessons - textbook courseware, assessing comprehension - Kahoot, Quizzes, and Booklet, practicing English listening skills - YouTube and Edpuzzle.

The significant advantages of integrating technologies into ELT classrooms consisted of learner-related advantages, teacher-related advantages, and other-related advantages. Firstly, it was relatively helpful for learners to promote learner motivation by gaining learners' attention and class attendance, to support manual operations during high-level learning, to clearly illustrate real-world relevance through highly visual presentations, to engage the learners through production work, to connect learners with audiences for their writing, to increase perceptions of control, and to encourage learners to manage time and learning more efficiently (Shelly et al., 1999; Roblyer & Edwards, 2000; Thornton & Sharples, 2005; Roblyer, 2006). Secondly, when teachers employed technologies in their instructional practices, they could improve teachers' unique instructional capabilities by linking learners to unique information sources and populations, blending learning and entertainment, helping learners visualize problems and solutions or concepts in unfamiliar or abstract topics, illustrating connections between skills and real-life applications, supplying interaction and immediate feedback to support skill practice, grading and tracking learner progress, and linking learners to learning tools (Roblyer & Edwards, 2000; Thornton & Sharples, 2005; Roblyer, 2006). Lastly, using technologies in the classrooms could be beneficial to institutes and societies in terms of developing curriculum with technology integration and increasing global learners and community relations (Whitehead et al., 2013).

On the other hand, barriers to technology integration into ELT could be divided into leaner-related barriers, teacher-related barriers, and institutional-related barriers. Firstly, an obstacle regarding the learner on using technologies was that the learners lacked computer skills (Hsu, 2016). Secondly, another barrier is directly

associated with teachers, and they seem to be significant obstacles such as teacher professional development and training, adequate technological resources (hardware and software), technology access, adequate planning time, teachers' lack of time to implement technology-integrated lessons, limited knowledge and skills of integrating technologies, negative attitude and beliefs, attitudes towards learning, instructional styles, pedagogical beliefs, personal characteristics, colleague influence, understanding how to use technology to facilitate meaningful learning, conversations with teachers' values on best educational technology practices, teachers' confidence, beliefs about how students learn, the perceived value of technology to the teacher and learning process (Ertmer, 1999; Coffland & Strickland, 2004; Ertmer, 2005; Eteokleous, 2008; Oncu et al., 2008; Ertmer & Ottenbreit-Leftwich, 2010; Whitehead et al., 2013; & Hsu, 2016). Finally, the obstacles on using technologies in ELT classrooms could be led by institutions such as administrative support, positive school environment, technical assistants, sustained funding for technology, the attitude of the principal, parental involvement, training and support, poor visioning institution, and weak assessment strategies (Ertmer, 1999; Coffland & Strickland, 2004; Ertmer, 2005; Eteokleous, 2008; Oncu et al., 2008; Whitehead et al., 2013; Hsu, 2016).

The existing research studies regarding using technologies in ELT indicated that there were three predominant research interests, including teachers' perspectives on technology integration, language learning development, and teacher professional development. Firstly, certain existing studies were conducted on investigating teachers' perspective towards the use of technology. The findings revealed that teachers had positive perspectives of the technology integration in the language instruction (Saglam & Sert, 2012; Kazemi & Narafshan, 2014; Coskun & Marlowe, 2015). Nonetheless, teacher encountered difficulties while utilizing technology in their classroom (Kazemi & Narafshan, 2014). Secondly, scholars attempted to implement different teaching methods with technologies to enhance learners' language skills. The findings showed that integrating technology into English language teaching could promote students' motivation (Wu et al., 2011; Al-Mohammadi & Derbel, 2014) and also enhanced their confidence in what they learned (Wu et al., 2011) as well as their academic performance (Al-Mohammadi & Derbel, 2014).

Lastly, certain studies were conducted on teacher professional development by implementing some teaching approaches with technologies due to achieve learning goals. The findings revealed that the integration of collaborative learning and technology-enhanced language learning was an intensely useful element in achieving the course goals (Reyes Fierro & Delgado Alvarado, 2015), but there were few ICT tools integrated into the textbooks (Hismanoglu, 2011). In addition, certain types of technology tools and some cutting-edge tools were employed in the classrooms (Saenkhot & Boonmoh, 2019; Thanasitrittisorn & Boonmoh, 2020). It can be seen that research studies on utilizing technologies in ELT have been conducted in predominant areas, such as examining teachers' perspectives, improving language instruction, and promoting the teacher profession. Nonetheless, the research study relating to exploring technology integration to promote students' critical thinking skills in ELT has remained unclear because there have not been adequate empirical studies in the existing research.

With regard to critical thinking skills, they have been introduced into education over the decades, but their definitions have still been varied depending on different fields. Initially, reflective thinking or critical thinking was considered as the kind of thinking that consists of turning a subject over in the mind and giving it serious and consecutive consideration (Dewey, 1933). Ennis (1987) suggested that critical thinking refers to a range of dispositions and abilities associated with critical thinking, concentrating on the ability to reflect skeptically and the ability to think in a reasoned way. Critical thinking is the general term given to a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims, to discover and overcome personal prejudices and biases, to formulate and present convincing reasons in support of conclusions, and to make reasonable, intelligent decisions about what to believe and what to do (Bassham et al., 2002). Cottrell (2005) defined critical thinking as a complex process of deliberation which involves a wide range of skills and attitudes for deciding what to believe or do and focuses on the ability to reflect skeptically and to think in a reasoned way. She also proposed that critical thinking is a cognitive activity associated with using the mind, so learning to think in critically analytical and evaluative ways means using mental processes such as attention, categorization, selection, and judgement (Cottrell, 2011). It can be seen that critical thinking skills involve cognitive processes, a wide range of

skills, and attitudes to identify, analyze, and evaluate arguments in reasoning ways for deciding what to believe and what to behave.

Increasing critical thinking skills in ELT classrooms could be beneficial for language learners in different dimensions. Students familiarize themselves with different uses of language to enhance their understanding of and appreciation of content when students are encouraged to read critically. Furthermore, students recognize the challenge of putting their ideas and experiences into words when students are fostered to write critically (Paul et al., 1989). In addition, the benefits of critical thinking skills could be categorized into different stages of life, including in the classroom, in the workplace, and in life (Bassham et al., 2002). Initially, critical thinking skills in classrooms concentrate on higher-order-thinking skills such as the active, intelligent evaluation of ideas and information. Therefore, critical thinking plays a vital role throughout the college curriculum. When entering the workplace, employers are looking not for employees with highly specialized career skills but for workers with good thinking and communication skills – quick learners who can solve problems, think creatively, gather analyzed information, draw appropriate conclusions from data, and communicate their ideas clearly and effectively. Lastly, critical thinking can help learners avoid making foolish personal decisions and also help them to avoid such mistakes by teaching them to think about important life decisions more carefully, clearly, and logically. Moreover, critical thinking skills could be constructive in terms of improving attention and observation, developing more focused reading, enhancing the ability to identify the key points in a text or other message rather than becoming distracted by less important material, promoting the ability to respond to the appropriate points in a message, providing knowledge of how to get our own point across more easily, and increasing skills of analysis that learners can choose to apply in a variety of situations (Cottrell, 2011).

Improving learners' critical thinking skills is burdensome because there have been various barriers to prevent learners to enhance these skills themselves. Basically, the problematic issues for stopping critical thinking skills' development could be lack of relevant background information, poor reading skills, bias, prejudice, superstition, egocentrism (self-centered thinking), sociocentrism (group-centered thinking), peer pressure, conformism, provincialism, narrow-mindedness, closed-mindedness, distrust

in reason, relativistic thinking, stereotyping, unwarranted assumptions, scapegoating, rationalization, denial, wishful thinking, short-term thinking, selective perception, selective memory, overpowering emotions, self-deception, face-saving, and fear of change (Bassham et al., 2002). Furthermore, Cottrell (2011) proposed certain barriers for improving critical thinking skills, including misunderstanding of what is meant by criticism, over-estimating our own reasoning abilities, lack of methods, strategies, or practice, reluctance to critique experts, affective reasons, mistaking information for understanding, and insufficient focus and attention to detail. Focusing on obstacles of enhancing critical thinking skills in the educational setting, it could be students' lack of higher-order thinking skills and abilities to differentiate critical thinking skills from the lower-order thinking skills – remembering, understanding, and applying (Halpern, 1998; Limpman, 1995; Tsui, 2006). In addition, other difficulties of developing critical thinking skills consisted of lack of critical thinking encouragement, lack of the modeling of critical thinking, poor methods of teaching writing, unqualified teachers in ESL, poor English language curriculum, lack of questioning habits, and lack of debates and discussion (Shaheen, 2012).

The existing research studies on critical thinking skills in ELT have been conducted in the last decade, and they could be identified into three primary research interests, including instructional approaches, language skills, and assessment. Firstly, different instructional approaches were implemented in the studies to enhance learners' critical thinking skills. The finding exposed that critical thinking skills could be observed after learning through the implemented instructional approaches (Yang & Gamble, 2013; Vong & Kaewurai, 2017; Heidari, 2020). Secondly, some research studies were conducted on improving learners' language skills and critical thinking skills through different learning activities. The findings showed that using reading activities in English language classrooms could enhance critical thinking skills (Bunsom et al., 2011; Wang & Seepho, 2016; Yooprayong et al., 2017), and students' language skills such as reading skills, writing skills, communicative skills, and speaking skills were improved after participating in critical thinking-based activities (Sarot et al., 2016; Moonma & Kaweera, 2022; Ruksapon, 2017; Arjpru, 2020).

Lastly, certain studies were conducted on assessing learners' critical thinking skills and developing a rubric for critical thinking assessment for writing. The findings

demonstrated that students had a positive attitude towards critical thinking skills (Warabamrungkul et al., 2018; Din, 2020) and the rubric consisted of six clear and valid domains for assessing critical thinking skills in an argumentative essay and it could be used to promote learning and critical thinking skills for EFL students (Nakkaew & Adunyarittigun, 2019). As seen in the existing studies on critical thinking skills in ELT, promoting learners' critical thinking skills through technology integration has not empirically been investigated, so this research area should be conducted to address a better understanding in the field.

The last research area of the existing studies was implementing technologies to promote critical thinking skills in ELT. The studies in this area in the field have been relatively growing. Generally, critical thinking skills, especially analysis and evaluation could be developed through English language learning activities with different informative and communicative technologies (Liang, 2023). Furthermore, previous studies demonstrated that students in English language classrooms could improve their critical thinking skills with a wide range of specific technologies. Primarily, digital storytelling was implemented in English instruction to promote critical thinking skills and its results revealed using digital storytelling could effectively foster students' critical thinking skills (Yang & Wu, 2012; Thang & Mahmud, 2017; Alshaye, 2021). Another technology which was employed to enhance critical thinking skills was different online courses (Akyol & Garrison, 2011; Chen & Hu, 2018; Akatsuka, 2020) and the results suggested that certain aspects of critical thinking skills could be promoted after students learned through these online courses. Consistently, the previous studies that employed online discussions to foster critical thinking skills in English instruction revealed that some aspects of critical thinking skills were enhanced when students participated in those discussions (Sadaf & Olesova, 2017; Al-Husban, 2020; Jamali & Krish, 2021). In addition, the existing studies regarding integrating digital teaching aids such as online resources, videos, and mobile applications asserted that those teaching aids could encourage students to critically analyze and evaluate information (Zhang, 2018; Mete, 2020; Haerazi et al., 2020).

According to the results of the existing studies in terms of technology integration in ELT, critical thinking skills in ELT, and utilizing technologies to promote critical thinking skills in ELT, it could be seen that using technologies in English

classrooms could help students significantly develop their English language skills. Critical thinking skills could be considerably enhanced through different English language skill activities. Furthermore, critical thinking skills could be effectively promoted with various technology-implemented language learning activities.

1.2 Statement of the problem

Several national education policies have required universities to design their curriculum that provides instructors with opportunities to effectively integrate technologies into their instruction and to deliver learning activities that allow learners to think critically. Nonetheless, several problems in using technologies and improving learners' critical thinking skills in ELT exist. Firstly, the existing research studies clearly identified that one of the key problems related to ELT was poor English language curriculum (Shaheen, 2012). Therefore, the students must be taught to think critically and a curriculum should be designed with instilling critical thinking skills, a metacognitive awareness, and repletion of thinking exercises (Mulnix, 2012). Similarly, these skills are not emphasized in English courses in GenEd. According to the course descriptions or even course evaluations of English courses in certain Rajabhat universities, utilizing technologies for supporting effective instruction is not clearly identified. Furthermore, increasing learners' critical thinking skills are questionable as well because it does not precisely appear in course descriptions, course objectives, or even course evaluation. It could be seen that delivering English courses in GenEd is relatively inconsistent with the guidelines of the national education policy.

Another problem that obstructed employing different technologies in the classrooms to promote critical thinking skills was a positive environment for technology use (Ertmer, 1999; Coffland & Strickland, 2004). Likewise, the teaching and learning environment was considered a problematic factor for learners to think critically (Mahapoonyanont, 2010). It could be seen that environment could relatively affect integrating technologies into learning activities for instructors and improving critical thinking skills for learners. The researcher as an EFL instructor encountered this kind of barrier such as no internet signal, a broken project, and so on. This kind of barrier was considered the university's responsibility to cope with and to construct a

positive environment for technology integration to promote learners' critical thinking skills.

In addition, the other problem impacting promoting technology integration and critical thinking skills is directly relating to teachers. There are various problematic issues associated with teachers on improving learners' technology skills such as teachers' lack of time to implement technology-integrated lessons, limited knowledge and skills in integrating technologies, understanding how to use technology to facilitate meaningful learning, conversations with teachers' values on best educational technology practices, teachers' confidence, beliefs about how students learn, the perceived value of technology to the teacher and learning process (Ertmer, 1999; Coffland & Strickland, 2004; Ertmer, 2005; Eteokleous, 2008; Oncu et al., 2008; Ertmer & Ottenbreit-Leftwich, 2010; Whitehead et al., 2013; & Hsu, 2016). Similarly, the obstacles caused by teachers in increasing learners' critical thinking skills consisted of unqualified teachers in ESL, a lack of questioning habits, and a lack of debates and discussion (Shaheen, 2012). It could be seen that teachers are relatively important in promoting technology use and critical thinking skills because they play a key role in constructing lessons and their learning activities with technology, modeling how to use technologies and how to think critically for achieving those activities.

With regard to the empirical evidence of the existing research studies, the studies pertinent to integrating technologies to foster critical thinking skills in ELT consisted of three areas, namely utilizing technologies in ELT, enhancing critical thinking skills in ELT, and implementing technologies to promote critical thinking skills in ELT. Firstly, the previous studies regarding using technologies in English language activities were conducted with different focuses, including teachers' perspectives on technology integration, language learning development, and teacher professional development. As a consequence, the studies relating to promoting critical thinking skills in ELT were not adequate. Secondly, the existing studies that were conducted in the area of developing critical thinking skills in English language classrooms focused on language skills and assessment for critical thinking skills. As a result, the studies associated with utilizing technologies to promote critical thinking skills through English instruction were not adequately examined. Finally, the existing studies relating to using technologies to promote critical thinking skills in English

language learning indicated that a variety of particular technologies were integrated to promote university students' critical thinking skills. Furthermore, various research approaches, namely quantitative and mixed-method approaches were employed to conduct the existing studies. Even though certain previous studies were conducted with a qualitative approach, they implemented different qualitative research designs such as a case study. In addition, the previous studies were conducted by concentrating on students' experiences of using technologies to develop their English abilities and critical thinking skills.

As seen from mentioned existing research studied, the researcher was interested in conducting the present study to address the gap in English language teaching. Firstly, the previous studies implemented different particular technologies such as digital storytelling, online courses, and online teaching aids in English language activities to promote critical thinking skills. Therefore, the present study was conducted to provide constructive insights regarding what a wide range of technologies EFL university teachers employed and how those technologies were used in their instructional practices. Secondly, most previous studies were conducted with quantitative and mixed-method approaches and certain studies employed a qualitative approach such as a case study. As a result, the present study was conducted by implementing a phenomenological qualitative research design to explore ELF university teachers' and students' lived experiences of integrating technologies to foster critical thinking skills in ELT.

According to the problematic issues and the existing research studies relating to technology integration to promote learners' critical thinking skills in ELT discussed above, the present study was conducted to explore what technologies and how those technologies were used in the English language classrooms. The study not only investigated what problems teachers encountered and how they solved those problem, but also examined what influential factors towards their technology integration were. Lastly, learners' perceptions towards technology integration to promote critical thinking skills were investigated from their reflections emerged from their experiences.

1.3 Purposes of the study

The purposes of the present study were:

1. To explore the essence of EFL university teachers' technology integration to promote students' critical thinking skills

2. To explore Thai EFL university students' perceptions towards learning with technology integration to promote their critical thinking skills

1.4 Research questions

The present study were conducted to answer the following questions:

Aspect 1: EFL university teachers' lived experiences in integrating technologies to promote Thai EFL university students' critical thinking skills

1.1 What types of technology do teachers integrate into their instruction to promote students' critical thinking skills?

1.2 How do teachers integrate technologies into their instruction to promote students' critical thinking skills?

1.3 How effective do teachers perceive their technology integration to be in promoting students' critical thinking skills?

1.4 What problems do teachers encounter when integrating technologies into their instruction to promote students' critical thinking skills?

1.5 How do teachers solve the problems that they encounter when integrating technologies to promote students' critical thinking skills?

1.6 What are the factors that influence teachers' technology integration to promote students' critical thinking skills?

Aspect 2: Thai EFL university students' perceptions towards learning with technology integration to promote their critical thinking skills

- What are students' perceptions towards learning with technology integration to promote their critical thinking skills?

1.5 Scope of the study

The scope of the present study focused on the lived experiences of EFL university teachers regarding technology integration to promote students' critical thinking skills. Therefore, a phenomenological research design was implemented to

understand the essence of the phenomenon. Interviews and observations were employed to collect data in the 2022 academic year. The interviews were composed of three sub-interviews with different purposes. The first sub-interview aimed to gain the background information of the participants. The second sub-interview aimed to investigate participants' lived experiences of the phenomenon. The purpose of the last sub-interview was to explore the meaning of lived experiences of the phenomenon. For observation, the researcher visited instructors' classrooms for one instructional cycle for 1–2 sessions.

The participants consisted of a group of EFL university instructors and a group of Thai EFL university students. The researcher collected data from two groups of participants to ensure that the data could be credible. Furthermore, all participants of those two groups had to satisfy the inclusion criteria of participant selection because it could guarantee that the data can be credible for the context. To include teachers in the study, teachers had to be full-time teachers at one of the Rajabhat universities in the western region of Thailand and they received at least 1 year of university teaching experience. Moreover, teachers had to instruct at least 1 English course in the GenEd course and utilized technologies in their instruction to allow students to think critically. Regarding inclusion for students of the study, students had to be students at one of the Rajabhat universities in the western region of Thailand and studied at least 1 English course in the GenEd course. Furthermore, students had to experience learning with technology integration that allowed them to think critically.

1.6 Significance of the study

The present study aimed to contribute to this growing area of research in ELT by exploring technology integration to promote students' critical thinking skills. The study provided new insights and a deep understanding of the phenomenon to different stakeholders. Firstly, it was relatively constructive for EFL university teachers who have encountered certain challenges when integrating technologies to allow their students to think critically. They could obtain new insights and certain practical teaching techniques on what technologies and how those technologies were utilized to motivate their students to think critically. Furthermore, they could clearly comprehend what problems and their solutions were when using technologies in EFL classrooms.

Therefore, teachers could make use of the findings of the present study as a guideline to develop their instruction with technology integration to promote critical thinking skills and their profession.

In terms of significance for curriculum developers, the study could offer valuable information to design course objectives and evaluations that promote the use of technology and critical thinking skills. The survey of entrepreneurs' workforce requirements revealed that Thai workers' skills, such as foreign language skills, computer skills, management skills, and so on, were lower than their expectations (Ministry of Higher Education, Science, Research and Innovation, 2019). Therefore, curriculum developers must be aware of these challenges and should create a curriculum and courses, especially English courses in GenEd, which promoted technology use and critical thinking skills. It could be particularly useful for teachers to develop their profession in technology-driven instruction. Furthermore, it provided students opportunities to practice their technology skills as well as critical thinking skills.

Lastly, the study was relatively constructive for university administrators to improve infrastructures and facilities for positive technology environments in the research setting. The administrators obtained the structural description that portrayed the experiences of the phenomenon from the voices and reflections of the participants. They could gain a deeper understanding of problems and influential factors that obstructed using technologies to promote critical thinking skills. Thus, the study could be employed to create university projects and policies to develop a better positive technology environment. It could be beneficial for all students to equally access technologies and encourage their critical thinking skills.

1.7 Definitions of terms

Technology integration refers to a particular systematic process of teaching and learning that incorporate all digital technologies both hardware and software with each subject-related area of curriculum and that is designated which hardware and software and which methods for implementing them are appropriate to enhance quality of learning and to achieve learning objectives (Heinich et al., 1993; Muffoletto, 1994; Shelly et al., 1999; Roblyer & Edwards, 2000; Roblyer, 2006; Law et al., 2016).

C*ritical thinking skills* refer to a cognitive process which involves recognizing information, exploring information, analyzing information, evaluating information, sharing information, giving reasons, and creating solutions. (The College Board; 1981; Facione, 1989; Garrison et al., 2000; Anderson et al., 2001; Cottrell, 2005; Ennis, 2011)

Teachers refer to Thai or foreign EFL university instructors who have been working as full-time instructors at Language institute in one of Rajabhat universities in the western region of Thailand. They have been teaching in the GenEd course and have experienced using technologies in their classes.

Students refer to Thai EFL university students who have been learning in one of Rajabhat universities in the western region of Thailand. They have enrolled in the GenEd course and have experienced learning with technology integration.

Lived experiences refer to the perceptions and reflections of the participants that adequately disclose and explicate the phenomena that were technology integration to promote students' critical thinking skills.

CHAPTER 2

REVIEW OF LITERATURE

The aim of this chapter is to review the related literature of the present study. It is comprised of six primary parts. Firstly, the overview of beliefs (definitions, characteristics, differences between belief system and knowledge system, teacher's knowledge, and relationships between teachers' beliefs and practices) is presented. Secondly, the backgrounds of ELT, technology integration, and critical thinking skills Thailand is shown. Thirdly, the backgrounds of technology integration in English language teaching (definition, types, theoretical framework, teachers' roles, technology skills, and advantages and barriers) is presented. Fourthly, the backgrounds of critical thinking skills in English language teaching (definitions, characteristics, theoretical framework, significance, and advantages and barriers) is presented. Lastly, the related previous studies on beliefs and practices, technology integration, and critical thinking skill in English language teaching are discussed.

2.1 Backgrounds of teachers' beliefs

2.1.1 Definitions of beliefs

Although the concept of beliefs has been an ordinary issue in education for the past decades and had currently become a vitally crucial one in English language teaching, there is no consensus on their definitions (Borg, 2001). Moreover, it is difficult to precisely define beliefs and belief systems because it depends on researchers' and studies' purposes (Eisenhart et al., 1988). Therefore, a group of scholars in diverse fields of the educational community has attempted to define them with various perspectives. Dewey (1933, p. 6) used the term 'belief' as the third meaning of thought, "something beyond itself by which its value is tested; it makes an assertion about some matter of fact or some principle or law". In addition, he identified that the importance of belief is crucial for "it covers all the matters of which we have no sure knowledge and yet which we are sufficiently confident of to act upon and also the matters that we now accept as certainly true, as knowledge, but which nevertheless may be questioned in the future".

For Rokeach (1968, p. 113), beliefs was defined as “any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase, ‘I believe that . . .’”. He also suggested that “the content of a belief may describe the object of belief as true or false, correct or incorrect; evaluate it as good or bad; or advocate a certain course of action or a certain state of existence as desirable or undesirable”. Brown and Cooney (1982) explained that beliefs are dispositions to action and major determinants of behavior although the dispositions are time and context specific – qualities that have important implications for research and measurement. Abelson (1979, p. 356) defined “belief system in terms of some processes by which a human accesses and manipulates that knowledge under current activating circumstances and/ or in the particular current purposes”. Harvey (1986, p. 660) explained “belief system as a set of conceptual representations which signify to its holder a reality or given state of affairs of sufficient validity, truth, and/ or trustworthiness to warrant reliance upon it as a guide to personal thought and action”.

According to the aforementioned nonconsensual definitions of beliefs and belief systems, the term ‘beliefs’ and ‘belief systems’ are used interchangeably to mean personal thoughts that individuals possess with a particular purpose towards matters as true or false, good or bad, and correct or incorrect. Individuals do not certainly ensure these beliefs as knowledge; as a result, beliefs can be questionable in the future. Moreover, beliefs associate and navigate individuals’ thoughts, actions, and behaviors.

Apart from the definitions of beliefs in general, teachers’ beliefs have been recognized in different concepts. Porter and Freeman (1986) defined orientations to teaching as including teachers' beliefs about students and the learning process, about the role of schools in society, and about teachers themselves, the curriculum, and pedagogy. Certain scholars favored another term of teachers’ beliefs. Goodman (1988) preferred the term *teacher perspectives* that two students may express similar beliefs about teaching and education but the image associated with the verbal expressions of their beliefs may differ considerably. Moreover, they could be defined as a reflective, socially defined interpretation of experience that serves as a basis for subsequent action – a combination of beliefs, intentions, interpretations, and behavior that interact continually (Clark and Peterson, 1986, p. 287). According to the

aforementioned definitions of teachers' beliefs, it could imply that teachers' beliefs are an instructional orientation of teachers towards students, learning processes, roles of school in society, teachers themselves, curriculum, and pedagogy. Furthermore, teachers who possess similar beliefs about instruction might have different actions or behaviors depending on their interpretation of teaching experience.

2.1.2 Characteristics of beliefs

As seen in the nonconsensual definitions of beliefs and belief systems, there have still not been their definitive meanings to accurately understand them. Therefore, a number of scholars have attempted to differentiate features of beliefs because they would like to distinguish beliefs from knowledge. Rokeach (1968, pp. 113-114) identified that beliefs can be characterized into three types, including 1) a descriptive or existential belief such as I believe that the sun rises in the east; 2) an evaluative belief such as I believe this ice cream is good; and 3) a prescriptive or exhortatory belief such as I believe it is desirable that children should obey their parents. Moreover, he advocated that each belief particularly consists of three components, including a cognitive component which possesses various levels of certitude about what is true or false, good or bad, desirable or undesirable; an affective component which fosters a different intensity of effect towards individual's or groups' belief; and a behavioral component which causes certain action when belief is appropriately activated.

Seven significant characteristics of belief systems are proposed by Abelson (1979) to differentiate belief systems from knowledge systems. Firstly, the elements (concepts, propositions, rules, etc.) of a belief system are not consensual. That is, the elements of one system might be quite different from those of a second in the same content domain. And a third system is different from both. The second characteristic is that belief systems are in part concerned with the existence or nonexistence of certain conceptual entities. God, ESP, witches, and assassination conspiracies are examples of each entities. Alternative worlds are the third characteristic that often includes representations of alternative worlds, typically the world as it is and the world as it should be. The next characteristic is that belief systems rely heavily on evaluative and affective components, including two aspects – cognitive and

motivational. The fifth characteristic is that belief systems are likely to include a substantial amount of episodic material from either a personal experience, or (for cultural belief systems) from folklore, or (for political doctrines) from propaganda. Another characteristic of belief systems is that the content set to be included in a belief system is usually highly open. That is, it is unclear where to draw a boundary around the belief system, excluding irrelevant concepts lying outside. Lastly, beliefs can be held with varying degrees of certitude. That is, the believer can be passionately committed to a point of view, or at the other extreme could regard a state of affairs as more probable than not.

Nespor (1987) conducted the research study on teachers' beliefs and proposed that the structure of beliefs consisted of four features which some were addressing to Abelson (1979)'s beliefs' characteristics while some were arguing them. Those four features of beliefs are compounded of 1) existential presumptions – beliefs are the incontrovertible, personal truths everyone holds and also perceives as immutable entities that exist beyond individual's control or knowledge; 2) alternativity - individuals attempt to create an ideal, or alternative situations that significantly differ from present realities; 3) affective and evaluative aspects - beliefs have stronger affective and evaluative components than knowledge and also operate independently of forms of the cognition typically associated with knowledge; 4) episodic storage - knowledge system information is semantically stored whereas beliefs reside in episodic memory which is organized around personal experience or critical episodes and these episodes plays important roles in individuals' practices.

Moreover, Borg (2001) introduced the common features of beliefs which are clearer to understand. Firstly, the truth element drawing on research in the philosophy of knowledge, suggests that a belief is a mental state which has as its content a proposition that is accepted as true by the individual holding it, although the individual may recognize that alternative beliefs may be held by others. This is one of the key differences between belief and knowledge, in that knowledge must actually be true in some external sense and also knowledge is commonly defined as 'justified true belief' (Fenstermacher, 1994). Secondly, the relationship between beliefs and behavior referring to most definitions of belief proposes that beliefs dispose or guide people's thinking and action. Thirdly, conscious and unconscious beliefs state that

consciousness is inherent in the definition of belief, and others allowing for an individual to be conscious of some beliefs and unconscious of others. Lastly, beliefs as value commitments recognize an evaluative aspect to the concept.

Discussing Rokeach (1968)'s, Abelson (1979)'s, Nespor (1987)'s and Borg (2001)'s conceptualizations of belief characteristics, it shows that there are three predominant features of beliefs that these scholars completely agreed on, including existence of entities, evaluative and affective aspects, and episodic memory. In addition, there are two more characteristics of beliefs that certain of these scholars consistently suggested, including non-consensus and alternative world. Therefore, these proposed features of beliefs could be essential and clearer criteria to distinguish beliefs from knowledge.

2.1.3 Differences between beliefs and knowledge

Certain scholars have distinguished beliefs from knowledge by proposing the characteristics of beliefs to comprehend them more precisely. Here are several essential features of beliefs and knowledge which are presented in Table 2.1.

Table 2.1 Distinctions between beliefs and knowledge

Scholars	Beliefs	Knowledge
Abelson (1979)	- psycho-logic - episodic material - self-concepts	- logic - facts and principles - exclude the self
Nespor (1987)	- nonconsensuality - affective and evaluative aspects - very nature disputable - more inflexible - less dynamic - unchangeable - unbounded	- consensuality - cognitive aspects - open to evaluate and criticize

Scholars	Beliefs	Knowledge
Roehler, Duffy, Herrmann, Conley, and Johson (1988)	- static - eternal truths - unchangeable - emotional aura	- fluid - neutral emotion
Pajares (1992)	- evaluation and judgment	- objective facts

According to certain suggestions of scholars on differences between belief systems and knowledge ones, it could be implied that belief systems are structures based on psycho-logic, episodic memories as well as individuals' self-concepts. In addition, they are static or unchangeable and less dynamic without accepting criticism. Nonetheless, knowledge systems are based on logic and objective facts which are fluid and open to unemotionally evaluate.

2.1.4 Teachers' knowledge

The issue of what makes good teachers or what good teacher must know is considered as one of the factors which affect teachers' belief and practices. Slavin (2009) suggested that there were two main components which make good teachers, including 1) knowing the subject matter, and 2) mastering teaching skills with different tasks – motivating students, managing the classroom, assessing prior knowledge, communicating ideas effectively, taking into account the characteristics of the learners, assessing learning outcomes, and reviewing information. However, there have been other matters which help teachers become good ones such as warmth, enthusiasm, and caring (Cornelius-White, 2007; Eisner, 2006) and knowledge about how about children learn (Wiggins & McTighe, 2006).

Furthermore, to become expert teachers who elaborate systems of knowledge for understanding problems in teaching (Woolfolk, 2004), Shulman (1987) proposed seven areas of professional knowledge which expert teachers know, including the academic subjects they teach; general teaching strategies that apply in all subjects such as the principles of classroom management, effective teaching, and evaluation; the curriculum materials and programs appropriate for their subject and grade level; subject-specific knowledge for teaching: special ways of teaching certain students and particular concepts such as the best ways to explain negative numbers to

lower-ability students; the characteristics and cultural backgrounds of learners; the setting in which students learn – pairs, small groups, teams, classes, schools, and the community; and the goals and purposes of teaching.

A number of categories relating to teachers' knowledge has been suggested by several scholars and some typologies of knowledge also have been proposed to describe the types of knowledge which teachers hold and how they might be interrelated (Grossman, 1990; Kremer-Hayon, 1990). Calderhead, 1996 proposed certain knowledge's types as follow:

Subject knowledge primarily concentrates on the managerial aspects of teaching such as how teachers organize the classroom and the children, and general strategies of planning. Moreover, Shulman (1986) divided the knowledge that grows in the minds of teachers into three categories of content knowledge as follows:

Content knowledge refers to the amount and organization of knowledge in the mind of teacher. It requires understanding the structures of the subject matter in the manner. Therefore, teachers must not only be capable of defining for students the accepted truths in a domain, but they must also be able to explain why a particular proposition is deemed warranted, why it is worth knowing, and how it relates to other propositions, both within and without the discipline, both in theory and in practice.

Pedagogical content knowledge refers to the knowledge which goes beyond knowledge of subject matter to the dimension of subject matter knowledge for teaching. It includes the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstration – in a word, the ways of representing and formulating the subject that make it comprehensible to others. In additions, pedagogical content knowledge consists of an understanding of what makes the learning of specific topics easy or difficult: the conceptions and preconceptions that students of different ages and backgrounds bring with them to the learning of those most frequently taught topics and lessons.

Furthermore, Grossman (1990) suggested that pedagogical content knowledge could be separated into four categories: conceptions of purposes for teaching subject matter, knowledge of students' understanding (including common

misconceptions and difficulties), curricular knowledge, and knowledge of instructional strategies.

Curricular knowledge refers to the full range of programs designed for the teaching of particular subjects and topics at a given level, the variety of instructional materials available in relation to those programs, and the set of characteristics that serve as both the indications and contraindications for the use of particular curriculum or program materials in particular circumstances.

Craft knowledge refers specifically to the knowledge that teachers acquire within their own classroom practice, the knowledge that enables them to employ the strategies, tactics and routines that they do. This type of knowledge can be called with several terms such as the wisdom of practice (Schwab, 1971; Shulman, 1987), the professional knowledge (Brown & McIntyre, 1993), and knowledge in action of the practitioner (Schon, 1983, 1987).

Case knowledge refers to comparisons of teaching with other professions; as a result, teachers acquire several inquiries into the case knowledge. That is, teachers build their own case knowledge – a knowledge base of significant incidents, events, and people that enables new situations to be identified and helps guide teachers' practice.

Theoretical knowledge refers to the contention that teaching might be based on a body of theoretical knowledge is a phenomenon that has developed in relatively recent decades (Alexander, 1984). In addition, the growth of rich bodies of literature on children's learning and maturation, curriculum development, and the organization of the school would seem to be essential elements of a teacher education curriculum that might equip teachers with concepts and theories for thinking about their day-to-day practice.

When technologies come into play in education, Koehler and Mishra (2008, pp. 12) proposed three concentric circles model, which built upon the work of Shulman, includes content knowledge (CK), pedagogical knowledge (PK), and technology knowledge (TK). These three bodies of knowledge interact with each other and represent additional knowledge, including pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPCK).

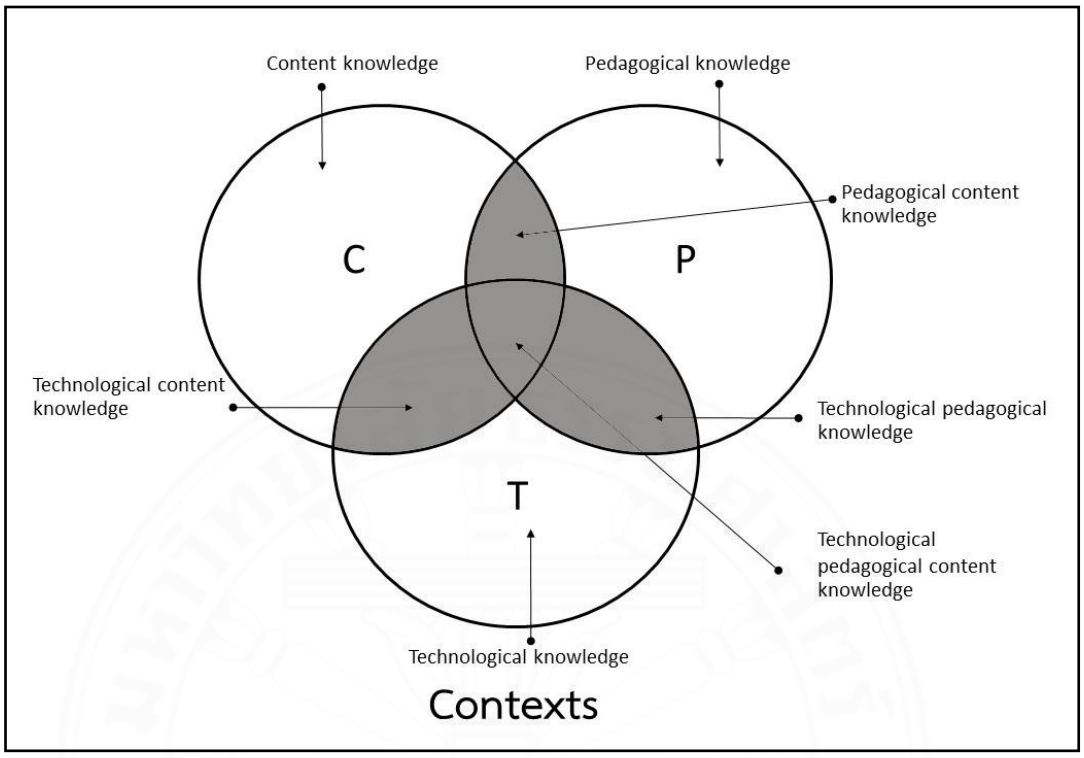

Figure 2.1 The TPCK framework and its knowledge components

Noted. Adapted from *Handbook of technological pedagogical content knowledge (TPCK) for educators* (p. 12), by M. J. Koehler and P. Mishra, 2008, Routledge for the American Association of Colleges for Teacher Education. Copyright 2008 by Taylor & Francis.

Content knowledge (CK) is knowledge about the actual subject matter that is to be learned or taught. Knowledge of content is of critical importance for teachers and it includes knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence and proof, and established practices and approaches towards developing such knowledge.

Pedagogical knowledge (PK) is deep knowledge about the processes and practices or methods of teaching and learning and encompasses overall educational purposes, values, and aims. This is a generic form of knowledge that applies to student learning, classroom management, lesson plan development and implementation, and student evaluation. Also, it includes knowledge about techniques

or methods used in the classroom, the nature of the target audience, and strategies for evaluating student understanding.

Technology knowledge (TK) is changeable knowledge more than the other two core knowledge domains in the TPCK framework (pedagogy and content). In this sense, TK is close to the definition of fluency of information technology (FITness) proposed by the Committee of Information Technology Literacy of the National Research Council (1999). FITness requires persons understand information technology broadly enough to apply it productively at work and in their everyday lives, to recognize when information technology can assist or impede the achievement of a goal, and to continually adapt to changes in information technology. Thus, FITness requires a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem-solving.

Pedagogical content knowledge (PCK) is similar to Shulman's idea of knowledge of pedagogy. PCK covers the core business of teaching, learning, curriculum, assessment, and reporting such as the conditions that promote learning and the link among curriculum, assessment and pedagogy. An awareness of common misconceptions and ways of looking at them, the importance of forging links and connections between different content ideas, students' prior knowledge, alternative teaching strategies, and the flexibility that comes from exploring alternative ways of looking at the same idea or problems are all essential for effective teaching.

Technological content knowledge (TCK) is an understanding of the manner in which technology and content influence and constrain one another. Teachers need to master more than the subject matter they teach, they must also have a deep understanding of the manner in which the subject matter can be changed by the application of technology. In addition, teachers need to understand which specific technologies are best suited for addressing subject-matter learning in their domains and how the content dictates or perhaps changes the technology – or vice versa.

Technological pedagogical knowledge (TPK) is an understanding of how teaching and learning changes when particular technologies are used. It includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies. This requires getting a deeper understanding of the constraints and

affordances of technologies and the disciplinary contexts within which they function. Therefore, TPK requires developing creative flexibility with available tools in order to repurpose them for specific pedagogical purposes and a forward-looking, creative, and open-minded seeking of technology for the sake of advancing student learning and understanding.

Technological pedagogical content knowledge (TPCK) is the basis of effective teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that student face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones.

Discussing the TPCK framework, it could be seen that there is three significantly predominant knowledge, including content knowledge, pedagogical knowledge, and technological knowledge. Furthermore, there is further knowledge when the primary circles of knowledge are integrated with each other, including pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge, and technological pedagogical content knowledge. The set of predominant knowledge underlying this framework could be mainly influencing factors that promote EFL university teachers to integrate technologies into their instruction to enhance students' critical thinking skills. Moreover, it could be constructive for EFL university teachers for their professional development.

To deeply understand pedagogical knowledge of teachers about how teachers plan their lessons, how they instruct in the classrooms, and how they assess their learners' comprehension of the lessons, certain educators have explicitly identified the instructional cycles. They are mostly divided into three phases, including before instruction, during instruction, and after instruction as follows:

Pre-instructional phase or planning phase or before the lesson or course refers to a process of choosing content, selecting approach, allocating time and space, determining structure, and deciding motivation (Arends, 1998). Moreover, teachers might consider what students know, what resources they have, and what they shall do

(Woodward, 2001; Butt, 2008). There are further essential questions that teachers take into account, including what is the scheme of work that the students are following?, what do teachers want the students to learn in the lesson teachers are planning (and in future lessons)?, and how will their lesson plan facilitate learning? (Butt, 2008).

Interactive phase or instructing phase or during the lesson or course refers to a process of presenting, questioning, assisting, providing for practice, making transitions, and managing and disciplining (Arends, 1998). Furthermore, teachers watch and listen to the students, investigate how time is going, and note questions and reactions (Woodward, 2001).

Post-instructional phase or assessing phase or after the lesson or course refers to a process of checking for understanding, providing feedback, praising and criticizing, testing, grading, and reporting (Arends, 1998). In addition, teachers check what is leftover and how their instruction shifts student perception and skill (Woodward, 2001). Other crucial questions teachers should consider are how will teachers know what the students have learnt (assessment)?, how will teachers know how effective the lesson has been from their perspective as the teacher and the students' perspective as learners (evaluation)?, and what action will teachers need to take in future lessons to ensure that effective learning is taking place? (Butt, 2008).

According to the mentioned teachers' knowledge, it provides us the insight that two primary areas are integrating into teachers' knowledge, including categories of teachers' knowledge and instructional cycles. These could affect teachers' beliefs and practices on their instruction in the classroom. Therefore, the more teachers comprehend insightfully different types of teachers' knowledge and instructional cycle, the more effective their teaching practices in the classrooms are.

2.1.5 The relationship between beliefs and practices

Generally how individuals' beliefs associated with their practices could be seen by the definitions of beliefs. Most beliefs' definitions propose that beliefs are a set of thoughts and dispositions with particular purposes and they are considered as navigation or guidance of individuals to act and behave (Dewey, 1933; Brown & Cooney, 1982; Harvey, 1986). Moreover, certain characteristics of beliefs confidently assert that beliefs dispose their holders towards thinking and action (Borg, 2001).

According to mentioned definitions and features of beliefs, it could boldly imply that individuals' beliefs could specifically have a strong relationship to their behaviors in everyday practices.

Particularly, teachers' beliefs could affect a teacher's style which is a collection of the many attitudes and behaviors he employs to create the best possible conditions under which learning can take place (Wright, 1987). The teacher's style could be influenced by teachers' beliefs and attitudes, including cultural and social beliefs and attitudes about how to behave in social groups; beliefs about the role of knowledge in teaching and learning; beliefs about the nature of learning; and beliefs about the nature of knowledge in the case of language teacher and a view of language (Wright, 1987).

There have been several previous research studies revealed that teachers' beliefs influencing their classroom practices. The study of Hsu (2016) revealed that the teacher holding constructivist pedagogical beliefs about technology use seemed to have high self-efficacy beliefs about technology use, to position a positive value on technology, and to have two or more practices of high-level learning in their lessons. This finding suggested that teachers' constructivist pedagogical beliefs could be the primary predictor of teachers' classroom technology use. Similarly, the research finding of Huttayavilaiphan (2019) suggested that teachers' beliefs are the significant construct in the teacher cognitive system playing a crucial role in the teachers' teaching practice decision.

Teachers' beliefs, nonetheless, may well be quite generalized, abstract value commitments and it has been found that teachers can sometimes possess quite conflicting beliefs that create dilemmas for them in thinking about practice or result in contrasting beliefs being used to justify contradictory actions in different contexts (Cornett, 1990). Furthermore, an important aspect of teachers' professional development is the process of making implicit belief systems explicit and developing a language for talking and thinking about their own practice, questioning the sometimes contradictory beliefs underpinning their practice, and taking a greater control over their own professional growth (Freeman, 1991).

According to mentioned associations between teachers' beliefs and their practices, it seems that teachers' behaviors are influenced by teachers' beliefs such as

beliefs about students, beliefs about learning processes, beliefs about roles of school in society, beliefs about teachers themselves, beliefs about curriculum, and beliefs about pedagogy.

2.2 Technology integration in ELT

2.2.1 Definitions of technology integration in ELT

Educational technology and instructional technology have generally been referred to when integrating technology in the classroom. Muffoletto (1994) stated that technology was commonly thought of in terms of gadgets, instruments, machines, and devices as well as most educators will defer to technology as computers. In addition, he identified that technology was not a collection of machines and devices, but a way of acting. Similarly, educational technology is a combination of the processes and tools involved in addressing educational needs and problems, with an emphasis on applying the most current tools; computers and their related technologies (Roblyer & Edwards, 2000). In contrast, instructional technology is a subset of educational technology that deals directly with teaching and learning applications (Roblyer, 2006). After understanding the boarder concepts which brings into mind when thinking about technology in the education context, what integrating technology in education is.

Technology integration is defined by various scholars in many dimensions as well as it is called with different terms such as technology of instruction, technology-enhanced learning environment (TEL), technology-enhanced learning and teaching (TEL&T), but still have the same definitions. Technology integration is a particular systematic arrangement of teaching and learning events designed to put knowledge of learning into practice in a predictable, effective manner to attain specific learning objectives (Heinich et al., 1993, p. 16). Shelly et al. (1999) suggested that it is the combination of all technology parts such as hardware and software together with each subject-related area of curriculum to enhance learning. In addition, she advocated that it is using technology to help meet the curriculum standards and learner outcomes of each lesson, unit, or activity.

Technology integration is considered as the incorporation of technology resources and technology-based practices into the daily routines, work, and

management of schools (U.S. Department of Education, 2002). In terms of integrating educational technology, Roblyer (2006) suggested that it refers to the process of determining which electronic tools and which methods for implementing them are appropriate responses to given classroom situations and problems. It is also defined as integrating the use of digital technology into the learning and teaching process to improve the quality of learning (Law et al., 2016, p. 73). According to the mentioned definitions, it could imply that technology integration is a particular systematic process of teaching and learning that incorporate all digital technologies both hardware and software with each subject-related area of curriculum and that is designated which hardware and software and which methods for implementing them are appropriate to enhance quality of learning and to achieve learning objectives.

Nonetheless, Shelly, Cashman, Gunter, and Gunter (1999) indicated that mastering technology integration is not easy because extensive formal training and practical experiences are imperative for successful integration of technology. Technology cannot improve learning unless teachers know how to use and integrate technology into subject-specific areas. Furthermore, teachers must remember that technology is only a tool to enhance or support new instructional strategies. Educators should take steps to integrate technology throughout classroom experiences and find ways to use technology to teach subject-specific information while establishing connections between those subjects and the real world.

2.2.2 Types of technology integration in ELT

There have been a variety of technologies which are implemented to support and promote teaching and learning for teachers and learners, so they have been categorized into 3 primary dimensions, including purposes of using technology, genres of technology, and functions of technology.

Slavin (2009) has grouped technologies integrated into education based on their purposes. Firstly, technologies are used for instruction. The most basic technologies teachers use for their instruction are word processors, electronic spreadsheets, and presentation software and multimedia. For instance, word processors are utilized for numerous teaching tasks such as preparing student worksheets and tests while electronic spreadsheets are used to organize and compute

numerical data, and to produce charts and graphs. Secondly, technologies are integrated for learning. Technology and applications have been used with numerous aims by learners in the classrooms. For instance, the learners make use of applications of computer-assisted instruction to provide learners the range of simple drill and practice software to complex problem-solving one, and they also utilize the internet to collect local data, communicate with other learners, and contribute their work to virtual publications. Lastly, technologies are employed for administration. Teachers utilize various technologies to achieve the main administrative tasks associated with their work such as grading and creating reports. On the other hand, schools are making use of technologies to monitor the progress of individual students and teachers and track learners' achievement through the school management system, including enrollment, attendance, and school expenditures.

According to Brabec, Fisher, and Pitler (2004), technologies have been categorized into five genres, including 1) word processing applications – software which allows the user to type and manipulate text such as Microsoft Word, OpenOffice.org Writer, Google Docs, MYAccess; 2) organizing and brainstorming software – software which allows the user to create idea maps, KWHL charts, and category maps such as Inspiration, Kidspiration, BrainStorm, SMART Ideas, Visual Mind; 3) multimedia – software which allows the user to create or access visual images, text, and sound in one product such as iMovie, Microsoft Movie Maker, Adobe Photoshop, Microsoft PowerPoint, Keynote, and Impress; 4) data collection tools – software and hardware which allow the user to gather data such as Probware, USB microscopes, classroom response systems; and 5) Web resources – resources available on the Web which allow the user to gather information or apply or practice a concept.

Moreover, other two additional genres address after those genres have been contributed, including 1) spreadsheet software – software which allows the user to type and manipulate numbers such as Microsoft Excel, OpenOffice.org Calc, InspireData, Google Spreadsheets; and 2) communication software – software which allows the user to communicate via text, presentation, voice, or a combination of the three (Pitler et al., 2007).

Furthermore, integrating technology into foreign language learning with different genres of technology has been proposed by Roblyer and Edwards (2000). Firstly, the Internet provides learners the significant opportunities to explore web sites which facilitate exchanges between learners of different notions. It, moreover, facilitates learners to communicate in foreign languages such as exchanging e-mail with native foreign language speakers and videoconferencing with native speakers. Secondly, computer software, especially computer-assisted language learning programs allows learners to drill and practice their foreign language skills through a myriad of programs such as grammar or vocabulary based-drill and practice programs. Word processing and hypermedia authoring tools can also be used to engage learners in applying what they know and help to promote automaticity. Finally, video clips allow learners to confront foreign languages in the context of native speakers and some software packages include tutorial and drill features of instructional software with video presentations, so learners can see and hear people speaking the language in various contexts.

Technologies integrated into English language learning and foreign language instruction based on their functions have been suggested by Roblyer (2006). Firstly, technologies support authentic oral and written practice such as multimedia software and interactive storybooks, learning games on handheld computers, language labs, and radio broadcasts. They can be utilized to help learners to internalize word meanings, rehearse oral English direction, and respond in written English. Secondly, technologies support practicing language subskills. They provide to learners to practice intensively in specific language subskills and vocabulary sets, and also correct common errors being made by learners or incorporate vocabulary currently being studied in class. Furthermore, the results of Hsu (2016)'s research study asserted that technologies were mostly employed in different language skills, including reading skills - websites, projector, United Streaming videos, and iPad; writing skills - SMART Board, Computers, and Kidspiration; and grammar - Microsoft Word and Microsoft PowerPoint.

Thirdly, technologies as presentation aids can reduce learners' stress and help them focus on their presentations. Moreover, media such as photographs or images can make classroom presentations more understandable and interesting.

Fourthly, technologies support text production, such as word processing programs. They can promote the authentic use of language in creating journals, descriptions of experiences, oral reports, and research projects. Furthermore, these programs foster correct usage with grammar checks, correct spelling, and a reminder to employ good style. Fifthly, technologies can provide virtual field trips for a modified language immersion experience. Some websites offer learners to virtually visit locations and have experiences that wouldn't be available to them. These sites provide expanded opportunities for language acquisition. Sixthly, technologies can provide virtual collaborations such as email and the Internet to work with learners of other cultures. They can motivate learners to use new language skills and learn more about the diversity of their own country than they would from textbooks. Eventually, technologies can provide productivity and lesson design support for teachers. The Internet holds a wealth of resources to save teachers time in locating and preparing lesson ideas and materials.

According to mentioned types of technologies, it could imply that teachers can integrate certain technologies into their instruction that rely on teachers' purposes, genres of technologies, and functions of technologies which are appropriate to their purposes to help teachers achieve effectively their learning objectives and goals.

2.2.3 Learning theoretical frameworks relating to technology integration

There are two primary learning perspectives of effective instruction related to technology integration in education. Roblyer and Doering (2014) proposed that one view – directed instruction, where teachers transmit a pre-defined set of information to students through teacher-organized activities, is based on objectivism – a belief system grounded primarily in behaviorist learning theory and the information-processing branch of the cognitive learning theories. The other view – inquiry-based learning, in which learners generate their knowledge through experiences and teachers serve only as facilitators, is based on constructivism which evolved from other branches of thinking in cognitive learning theory.

Furthermore, Roblyer and Doering (2014) suggested that a few technology applications such as drill and practice, tutorials, and integrated learning systems (ILSs) are associated only with directed instruction. When objectivists evaluate these

products, they typically look for a match among objectives, methods, and assessment strategies and how well they help teachers and students meet curriculum standards. To reflect objectivist principles, materials and integration strategies must have clearly defined objectives and a set sequence for their use.

In contrast, most others – problem-solving, multimedia production, web-based learning can inform either directed instruction or constructivist teaching and learning depending on how they are used. The key concept of constructivist methods is making learning more visual and experiential to enhance students more flexibility in how they learn and demonstrate competence (Roblyer & Doering, 2014). They also suggested there were certain learning theories related to constructivist instruction such as social learning, scaffolding, stages of development, and multiple intelligences theories. Therefore, teachers can integrate technologies into the classroom such as micro-worlds in which learners work with a very visual programming language to create on-screen designs, videodisc-based mathematics materials which provide learning environments that reflect situated cognition or instruction anchored in experiences that learners consider authentic, handheld computers which allow learners use data gathering tools to study problems and issues in their locale and create multimedia products to present their new knowledge and insights (Roblyer & Doering, 2014).

The term *constructivism* has been applied to a variety of theoretical approaches to the psychology of learning that share the underlying assumption that knowledge is produced through a socially-mediated interpretative process and constructivist approaches also provide strong support for the contention that effective learning begins from the learner's active participation in learning (Benson, 2011). There are a number of approaches which are rooted in constructivism. For instance, the ideal of a natural education believed that learners are responsible for their actions and learn by enjoying or suffering their consequences. Moreover, children develop naturally into individuals subject to their authority rather than the authority of others (Rousseau, cited in Boyd, 1956). Another approach could be the problem-solving method proposed by Dewey (1916/1966) with four distinctive types of project method, including 1) construction projects such as the development of a theoretical plan and its execution - performing a drama; 2) enjoyment projects such as reading a

novel; 3) problem projects such as an intellectual or social problem; and 4) specific learning projects such as learning a writing skill suggested by Kilpatrick (1921). Integration as a process could be considered an approach relating to constructivism that integration results from the capacity to adapt oneself to reality plus the critical capacity to make choices and to transform that reality (Freire, 1974)

According to the principles of objectivism, the researcher believes that EFL teachers instructing English courses in general education courses in the context of the present study predominantly employs technologies, including hardware and software or applications as a medium to foster their effective instructional practices and to help them and their learners successfully achieve courses objectives and learning goals. These concepts are based on objectivist learning theory. Nonetheless, certain approaches rooted in constructivism could be possibly implemented by EFL teachers in the present study to enhance learner's critical thinking skills because it depends on how EFL teachers integrate technologies into their learning activities to accomplish what the learners are expected to behave.

2.2.4 Advantages of technology integration in ELT

Integrating technology in education, especially in language learning have intensively positive impacts on various dimensions, including learners-related, teachers-related, and other-related advantages. According to a number of empirical research studies and scholars, they have revealed how technologies are integrated into constructive ways to learners. Initially, using technologies in EFL is useful for promoting learner motivation by gaining learners' attention and class attendance, supporting manual operations during high-level learning, illustrating real-world relevance through highly visual presentations, engaging the learners through production work, connecting learners with audiences for their writing, increasing perceptions of control, and encouraging learners to manage time and learning more efficiently (Shelly et al., 1999; Roblyer & Edwards, 2000; Thornton & Sharples, 2005; Roblyer, 2006).

Furthermore, it encourages students with varying abilities and different learning styles (Shelly et al., 1999) and also develops learners' achievement when the learners access different types of technologies such as computer-assisted instruction,

integrated learning system technology, software that teaches higher-order thinking, collaborative networked technologies, or design and programming technologies (Whitehead et al., 2013). Eventually, it prepares learners' required skills for lifelong learning in the information age, including technology literacy, information literacy, and visual literacy (Roblyer & Edwards, 2000).

Apart from the pros of utilizing technologies relating to learners, there have been certain advantages when integrating technologies in language classrooms for teachers. Firstly, technology utilization can effectively promote teachers' pedagogical knowledge. Technology integration in EFL improves teachers' unique instructional capabilities by linking learners to unique information sources and populations, blending learning and entertainment, helping learners visualize problems and solutions or concepts in unfamiliar or abstract topics, illustrating connections between skills and real-life applications, supplying interaction and immediate feedback to support skill practice, grading and tracking learner progress, and linking learners to learning tools (Roblyer & Edwards, 2000; Thornton & Sharples, 2005; Roblyer, 2006). Moreover, it fosters EFL teachers to implement new instructional approaches which consist of cooperative learning, shared intelligence, and problem-solving and higher-level skills (Roblyer & Edwards, 2000; Roblyer, 2006; Whitehead et al., 2013).

Secondly, integrating technologies into EFL classrooms can provide teachers with a variety of more effective teaching aids. There are the number of innovations when implementing language learning and teaching technologies into classrooms such as computers, CD-ROMs, DVD-ROMs, applications and software, multimedia applications, electronic books and references, laserdisc, communications applications and online chat, bulletin boards, forums, multiple object-oriented environments, audio-graphic environments, virtual worlds, video conferencing, blogs, wikis, and mobile devices (Shelly et al., 1999; Lamy & Hample, 2007). Furthermore, technology integration provides a range of teaching and learning applications and applications of cross-age tutoring which promote learning opportunities and supply self-paced learning for capable learners (Roblyer, 2006; Whitehead et al., 2013).

Thirdly, using technology can enhance different language skills through using various types of technologies in the classroom, including 1) using visuals in the

classroom can increase the likelihood of successful communication among learners and motivate learners in a text or presentation as well as generate their emotions; 2) integrating audio materials into the classroom helps learners who cannot read can learn from audio materials, and they can present stimulating verbal messages more dramatically than print can; and 3) applying motion media like videos and films into the classroom can portray concepts effectively and can promote effective learning, problem-solving skill, and cultural understanding (Heinich et al., 1993).

Fourthly, employing technologies in EFL classroom can increase teachers' and learner productivities. It expands teachers' productivities such as freeing time to work with students by helping with production and recordkeeping tasks, providing more accurate information more quickly, and allowing teachers to produce better-looking, more student-friendly materials more quickly (Roblyer & Edwards, 2000). On the other hand, it extends the number of learners' writings, developing higher quality writings, supporting reading skills (Thornton & Sharples, 2005; Whitehead et al., 2013). Lastly, it enhances greater communication with colleagues and parents (Whitehead et al., 2013).

Apart from the above two predominant categories of advantages of technology integration, other-related advantages when technologies are implemented into the language classrooms can be divided into two subcategories, including 1) institutional-related advantages such as developing curriculum with technology integration; and 2) social-related advantages such as developing global learners and enhancing community relations (Whitehead et al., 2013).

2.2.5 Barriers of technology integration in ELT

Several empirical research studies exposed that there have been a variety of barriers to obstruct using technology in the language learning environment which can be grouped into three primary categories. Firstly, learner-related barriers are regarding students' lack of computer skills (Hsu, 2016). Secondly, teacher-related barriers are regarding teacher training and professional development, adequate technological resources (hardware and software), technology access, adequate planning time, teachers' lack of time to implement technology-integrated lessons, limited knowledge and skills of integrating technologies, negative attitude and beliefs, attitudes towards

learning, instructional styles, pedagogical beliefs, personal characteristics, colleague influence, understanding how to use technology to facilitate meaningful learning, conversations with teachers' values on best educational technology practices, teachers' confidence, beliefs about how students learn, the perceived value of technology to the teacher and learning process (Ertmer, 1999; Coffland & Strickland, 2004; Ertmer, 2005; Eteokleous, 2008; Oncu et al., 2008; Ottenbreit-Leftwich et al., 2010; Whitehead et al., 2013; & Hsu, 2016).

Lastly, institutional-related barriers are regarding administrative support, positive school environment, technical assistants, sustained funding for technology, the attitude of the principal, parental involvement, training and support, poor visioning institution, and weak assessment strategies (Ertmer, 1999; Coffland & Strickland, 2004; Ertmer, 2005; Eteokleous, 2008; Oncu et al., 2008; Whitehead et al., 2013; & Hsu, 2016). According to mentioned significant barriers, there are three predominant obstacles to prevent EFL teachers to integrate technologies into their instructional practices, including learner-related barriers, teacher-related barriers, and institutional-related barriers.

2.2.6 Teachers' roles for technology integration in ELT

Teachers' primary roles are instructional and managerial and they complement each other (Wright, 1987). Therefore, it is very difficult to separate the two and often one act in the classroom can perform both functions simultaneously. The managerial function of teachers' roles is connected to various factors such as teachers' style, motivation, control and discipline, and so on. Apart from management and instructional roles of teachers, there are other hidden roles, including an evaluator – the teachers judges whether learners' contributions to the teaching/ learning process are valid, relevant, and correct; a guide – the teacher provides the subject under consideration and the way in which it is learned in the classroom and creates the rules for acquiring knowledge; a resource – the teacher is the resources of knowledge about the subject and how to acquire it; and an organizer – the teacher organize classroom activities, sets up learning tasks and assists the learners in doing these activities (Barnes, 1976).

Furthermore, a number of different roles of teacher consist of a controller – a teacher stands at the front of the class, dictates everything that happens as well as is a focus of attention; a prompter – the teacher encourages students and pushes them to achieve more as well as feeds them in a bit of information or language to help them proceed; a feedback provider – the teacher helps students to evaluate their performance; an assessor – the teacher tells students how well they have done or provides them grades; a resource – the teacher contributes to students language information when they need to consult; as well as a tutor – the teacher is an advisor who responds to what the students are doing and advises them on what to do next (Harmer, 2007).

Littlewood (1982, p. 92) introduced another concept of teachers' role that the teacher as an instructor is inadequate to describe his overall function. In a board sense, he is a 'facilitator of learning', and may need to perform in a variety of roles, separately or simultaneously. A facilitator can be described as an instructor who empowers his or her learners and gives them more initiative and responsibility (Stevick, 1998; Underhill, 1999). To understand the features of facilitators, Metzler (2011, p. 33) suggested seven key operations when the teacher acted as a facilitator, including 1) content selection - who determines what is taught in the unit?; 2) managerial control - who is mostly responsible for classroom management?; 3) task presentation - how do students receive task information?; 4) engagement patterns - how are student engagement patterns (involving space, groups, structure) determined?; 5) instructional interactions - who initiates the communication during learning tasks?; 6) pacing - who controls the starting and stopping of practice?; and 7) task progression - who decides when to change the learning tasks?.

In addition, Clifton (2006) defined four characteristics of facilitators concretely, including using backchannels, using referential questions, co-authoring the narrative, and requesting instruction. That is, backchannels are described as turn lubricators which are typically demonstrations of approval, attention, and understanding. Their character is supportive or neutral as regards the turn in hand, and in that sense they may facilitate the turn's development and may boost the duration and smoothness (Van Lier, 1988, p. 116). A further way of encouraging learner output is the use of referential questions (i.e. questions which request information not known

to the questioner as opposed to display questions that request information that is already known to the questioner).

The facilitator asks referential questions to which the learner is normatively constrained to reply. Another way of aiding the learner's production of the target language is to supportively add to the learner's developing narrative. Moreover, in extending the learner's turn the facilitator introduces a richer vocabulary which then becomes a source of instruction. Lastly, a further way of receiving instruction is for learners to request instruction when they are in communicative difficulties.

Apart from the roles of teachers, Benson (2011) identified that technologies or educational technologies which are forms of resource-based learning play very important roles in language teaching and learning because they treat learners with independent interaction with learning materials and there is also a long association between fostering learning autonomy and new learning technologies. Motteram (1997, p. 17) claimed that there has always been a perceived relationship between educational technology and learner autonomy. This is taking educational technology in its broadest sense and taking learner autonomy as the superordinate term. This has become increasingly true for computers and self-access. The functions of educational technology distribute to a number of language learning methods such as computer-assisted language learning, computer-mediated communication for language learning, mobile language learning.

2.2.7 Technology skills for technology integration in ELT

Technology skills have been defined in various ways. It is the ability to access, manage, apply, analyze, and evaluate digital information and instructional technological tools. This includes leveraging technology innovatively and effectively in diverse learning environments to collaborate, communicate, think critically, and create new functions in the midst of rapidly changing technological advances (Urbani et al., 2017). Moreover, technology skills could be used such ICT (Information, Communication, and Technology) use, IT (Information Technology) use, digital literacy, and computer literacy (Bawden, 2008). It refers to the human attributes associated with ICT use (Laar et al., 2017). Technology skills, therefore, seem to be

an ability of researching, applying, analyzing, and assessing information surrounding the digital environment as well as communicating it effectively.

The concepts of technology skills primarily indicate a basic set of skills in using computers or Internet technology such as turning off the computer, opening a folder and saving a file (Laar et al., 2017). However, digital literacy or technology skills is considered as the ability to understand and to use information from a variety of digital sources (Gilster, 1998). There are various aspects of technology skills, including 1) using technology as a tool to research, organize, evaluate and communicate information; 2) using digital technologies (computers, PDAs, media players, GPS, etc.), communication/ networking tools and social networks appropriately to access, manage, integrate, evaluate, and create information to successfully function in a knowledge economy; and 3) applying a fundamental understanding of the ethical/ legal issues surrounding the access and use of information technologies (The Partnership of 21st century learning, 2015).

Furthermore, ICT skills for teachers consists of 1) facilitating and inspiring student learning and creativity; 2) designing and developing digital age learning experiences and assessments; 3) modeling digital age work and learning; 4) promoting and modeling digital citizenship and responsibility; and 5) engaging in professional growth and leadership (the International Society for Technology in Education, 2008). According to mentioned aspects of technology skills, they are not only a basic use of technology such as turning on and off the computer but also they promote utilizing technology to access, research, organize, evaluate, and convey information from various digital sources as well as applying that gained knowledge to develop the professions.

Technology skills have come into play an important role in learning environments, especially language learning one because technology is now considered by most educators and parents to be an integral part of providing a high-quality education (U.S. Department of Education, 2003). Furthermore, technology could be used as follows: 1) accessing information such as information about language; 2) exposing the target language; 3) entertaining such as reading/ listening for pleasure; 4) creating text; 5) publishing learner work; 6) communicating and interacting with other language users/ learners; 7) creating community; and 8) managing and organizing

learning such as learning management systems, online vocabulary notebooks (Stanley, 2013).

In addition, it is more useful for teachers to enhance the curriculum with technology in the appropriate ways (Ottenbreit-Leftwich et al., 2010) and teachers could use technology to foster and enhance their existing instructional practices (Culp et al., 2005). Technology also encourages greater student-centeredness, greater openness towards multiple perspectives on problems, and greater willingness to experiment with their instruction (Knapp & Glenn, 1996). As mentioned, there are a number of advantages in promoting the use of technology in language classroom in the sense of enhancing curricula, language learning pedagogy and practices, as well as teachers' beliefs and attitudes.

2.3 Critical thinking skills in ELT

2.3.1 Definitions of critical thinking skills

Definitions of critical thinking skills have been proposed by numerous scholars. However, they have not been defined precisely yet. Reflective thinking or critical thinking was the kind of thinking that consists in turning a subject over in the mind and giving it serious and consecutive consideration (Dewey, 1933). Ennis (1987) identified a range of dispositions and abilities associated with critical thinking, concentrating on the ability to reflect skeptically and the ability to think in a reasoned way. Critical thinking consists of (1) disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking, (2) thinking that displays mastery of intellectual skills and abilities, and (3) the art of thinking about your thinking while you are thinking in order to make your thinking better, clearer, more accurate, or more defensible (Paul et al., 1989). Moreover, they distinguished critical thinking into two forms: selfish or sophistic, on the one hand, and fair-mined, on the other. In thinking critically, we use our command of the elements of thinking to adjust our thinking successfully to the logical demands of a type of mode of thinking.

However, Paul (1992) proposed his definition of critical thinking by coining other terms and emphasizing three significant dimensions of critical thought,

including the perfections of thought, the elements of thought, and the domains of thought as follows:

> Critical thinking is disciplined, self-directed thinking that exemplifies the perfections of thinking appropriate to a particular mode or domain of thought. It comes in two forms. If disciplined to serve the interests of a particular individual or group, to the exclusion of other relevant persons and groups, it is sophistic or weak-sense critical thinking. If disciplined to take into account the interests of diverse persons or groups, it is fair-minded or strong-sense critical thinking. (pp.9-10)

Moreover, the following scholars have thought critical thinking involves a cognitive process and abilities. Critical thinking is the careful and reflective process of evaluation claims and arguments (Kelly, 2001). Besides, critical thinking is self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way (Elder, 2002). Critical thinking is the general term given to a wide range of cognitive skills and intellectual dispositions needed to effectively identify, analyze, and evaluate arguments and truth claims, to discover and overcome personal prejudices and biases, to formulate and present convincing reasons in support of conclusions, and to make reasonable, intelligent decisions about what to believe and what to do (Bassham et al., 2002).

Consistently, Cottrell (2005) defined critical thinking as a complex process of deliberation which involves a wide range of skills and attitudes for deciding what to believe or do and focuses on the ability to reflect skeptically and to think in a reasoned way. Critical thinking is the use of those cognitive skills or strategies that increase the probability of desirable outcome and it is also used to describe thinking that is purposeful, reasoned, and goal-directed – the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions when the thinker is using skills that are thoughtful and effective for the particular context and type of thinking task (Halpern, 2007). Critical thinking means questioning not only assumptions of others but also questioning your own assumptions (Barnet & Bedau, 2011). Critical thinking is a cognitive activity associated with using the mind, so learning to think in critically analytical and

evaluative ways means using mental processes such as attention, categorization, selection, and judgement (Cottrell, 2011).

According to the mentioned definitions proposed by several scholars, critical thinking is a sequentially cognitive process which involves dispositions, abilities, and attitudes to reflect skeptically, analyze, and evaluate truth claims and arguments in a reasoned way for deciding what to believe and what to do.

2.3.2 Characteristics of critical thinking skills

Critical thinking skill have been characterized by various scholars. The College Board (1981) identified an appropriate set of guidelines for describing critical thinking, including 1) the ability to identify and formulate problems, as well as the ability to propose and evaluate ways to solve them; 2) the ability to recognize and use inductive and deductive reasoning and to recognize fallacies in reasoning; 3) the ability to draw reasonable conclusions from information found in various sources, whether written, spoken, tabular or graphic, and to defend one's conclusion rationally; 4) the ability to comprehend, develop, and use concepts and generalizations; and 5) the ability to distinguish between fact and opinion.

Facione (1989) proposed the consensus list of critical thinking cognitive skills and subskills, including 1) interpretation – categorization, decoding significance, and clarifying meaning; 2) analysis – examining ideas, identifying arguments, and analyzing arguments; 3) evaluation – assessing claims and assessing arguments; 4) inference – querying evidence, conjecturing alternatives, and drawing conclusions; 5) explanation – stating results, justifying procedures, and presenting arguments; 6) self-regulation – self-examination and self-correction.

According to Cottrell's concept of critical thinking as a process, there are various skills which involve in critical thinking, including 1) identifying other people's positions, arguments, and conclusions; 2) evaluating the evidence for alternative points of view; 3) weighing up opposing arguments and evidence fairly; 4) being able to read between the lines, seeing behind surfaces, and identifying false or unfair assumptions; 5) recognizing techniques used to make certain positions more appealing than others, such as false logic and persuasive devices; 6) reflecting on issues in a structured way, bringing logic and insight to bear; 7) drawing conclusions

about whether arguments are valid and justifiable, based on good evidence and sensible assumptions; and 8) presenting a point of view in a structured, clear, well-reasoned way that convinces others (Cottrell, 2005).

Ennis (2011) have proposed a list of critical thinking abilities, including 6 primary domains and 15 subdomains discussed as follows in Table 2.2.

Table 2.2 A list of critical thinking abilities

Domains and subdomains of critical thinking abilities	**Descriptors**
Basic clarification	
1. Focus on a question	a. Identify or formulate a question b. Identify or formulate criteria for judging possible answers c. Keep the question and situation in mind
2. Analyze arguments	a. Identify conclusions b. Identify reasons or premises c. Ascribe or identify simple assumptions d. Identify and handle irrelevance e. See the structure of an argument f. Summarize
3. Ask and answer clarification and/or challenge questions such as	a. Why? b. What is your main point? c. What do you mean by? d. What would be an example? e. What would not be an example (though close to being one)? f. How does that apply to this case (describe a case, which appears to be a counterexample)? g. What difference does it make? h. What are the facts?

Domains and subdomains of critical thinking abilities	Descriptors
	i. Is this what you are saying _____? j. Would you say more about that?
Bases for a decision	
4. Judge the credibility of a source. Major criteria (but not necessary conditions)	a. Expertise b. Lack of conflict of interest c. Agreement with other sources d. Reputation e. Use of established procedures f. Known risk to reputation (the sources' knowing of a risk to reputation, if wrong) g. Ability to give reasons h. Careful habits
5. Observe, and judge observation reports. Major criteria (but not necessary conditions, except for the first):	a. Minimal inferring involved b. Short time interval between observation and report c. Report by the observer, rather than someone else (that is, the report is not hearsay) d. Provision of records e. Corroboration f. Possibility of corroboration g. Good access h. Competent employment of technology, if technology applies i. Satisfaction by observer (and reporter, if a different person) of the credibility criteria in ability
Inference	
6. Deduce, and judge deduction	a. Class logic

Domains and subdomains of critical thinking abilities	Descriptors
	b. Conditional logic c. Interpretation of logical terminology, including (1) Negation and double negation (2) Necessary and sufficient condition language (3) Such words as “only”, “if and only if”, “or”, “some”, “unless”, and “not both” d. Qualified deductive reasoning (a loosening for practical purposes)
7. Make material inferences (roughly “induction”)	a. To generalizations. Broad consideration: (1) Typicality of data, including valid sampling where appropriate (2) Volume of instances (3) Conformity of instances to generalization (4) Having a principled way of dealing with outliers b. To explanatory hypotheses (IBE: “inference-to-best-explanation) (1) Major types of explanatory conclusions and hypotheses: (a) Specific and general causal claims (b) Claims about the beliefs and attitudes of people (c) Interpretation of authors’

Domains and subdomains of critical thinking abilities	Descriptors
	intended meanings (d) Historical claims that certain things happened (including criminal accusations) (e) Reported definitions (f) Claims that some proposition is an unstated, but used, reason (2) Characteristic investigative activities (a) Designing experiments, including planning to control variables (b) Seeking evidence and counterevidence, including statistical significance (c) Seeking other possible explanations (3) Criteria, the first four being essential, the fifth being desirable (a) The proposed conclusion would explain or help explain the evidence (b) The proposed conclusion is consistent with all known facts (c) Competitive alternative explanations are inconsistent with facts (d) A competent sincere effort has been made to find supporting and opposing data, and alternative hypotheses (e) The proposed conclusion seems plausible and simple, fitting into the

Domains and subdomains of critical thinking abilities	Descriptors
	broader picture
8. Make and judge value judgments Important factors	a. Background facts b. Consequences of accepting or rejecting the judgment c. Prima facie application of acceptable principles d. Alternatives e. Balancing, weighing, deciding
Advanced clarification	
9. Define terms and judge definitions, using appropriate criteria	a. Definition form (1) Synonym (2) Classification (3) Range (4) Equivalent-expression (5) Operational (6) Example and non-example b. Definitional functions (acts) (1) Report a meaning (criteria: the five for an explanatory hypothesis) (2) Stipulate a meaning (criteria: convenience, consistency, avoidance of impact equivocation) (3) Express a position on an issue (positional definitions, including "programmatic" and "persuasive" definitions) c. Content of the definition d. Identifying and handling equivocation
10. Attribute unstated assumptions	a. Pejorative flavor (dubiousness or

Domains and subdomains of critical thinking abilities	Descriptors
	falsity): commonly but not always associated to some degree with the different types. b. Types: (1) Presuppositions (required for a proposition to make sense) (2) Needed assumptions (needed by the reasoning to be at its strongest, but not logically necessary (called "assumptions of the argument" by Hitchcock (1985)) (3) Used assumptions (judged by hypothesis-testing criteria, Ennis 1982), called "assumptions of the arguer" by Hitchcock (1985)
Supposition and integration	
11. Consider and reason from premises, reasons, assumptions, positions, and other propositions with which they disagree or about which they are in doubt, without letting the disagreement or doubt interfere with their thinking ("suppositional thinking")	-
12. Integrate the dispositions and other abilities in making and defending a decision	-
Auxiliary abilities	
13. Proceed in an orderly manner appropriate to the situation:	a. Follow problem solving steps b. Monitor their own thinking (that is, engage in metacognition)

Domains and subdomains of critical thinking abilities	Descriptors
	c. Employ a reasonable critical thinking checklist
14. Be sensitive to the feelings, level of knowledge, and degree of sophistication of others	-
15. Employ appropriate rhetorical strategies in discussion and presentation (oral and written), including employing and reacting to "fallacy" labels in an appropriate manner. Examples of fallacy labels are "circularity," "bandwagon," "post hoc," "equivocation," "non sequitur," and "straw person"	-

Noted. Adapted from *The nature of critical thinking: an outline of critical thinking dispositions and abilities* (p. 2-4), by R. H. Ennis, 2011 (https://education.illinois.edu /docs/default-source/faculty-documents/robertennis/ thenatureofcriticalthinking _51711_000.pdf).

In addition, The Partnership for 21st century learning (2015) proposes specific descriptions of critical thinking skills which are profoundly crucial and beneficial for 21st century learning because the learners could 1) use various types of reason such as inductive and deductive as appropriate to the situation; 2) analyze how parts of a whole interact with each other to produce overall outcomes in complex systems; 3) effectively analyze and evaluate evidence, argument, claims, and beliefs; 4) analyze and evaluate major alternative points of view; 5) synthesize and make connections between information and arguments; 6) interpret information and draw conclusions based on the best analysis; and 7) reflect critically on learning experiences and processes. As aforementioned, the language learners should be promoted their critical thinking skills in order to become well critical thinkers and

they could make use of these advantages of critical thinking skills to achieve in their lifelong learning and working life.

According to aforementioned distinguished characteristics of critical thinking skills, it could summarize that there are four primarily identical characteristics, including 1) identifying and analyzing problems or arguments; 2) evaluating the evidence from various sources and alternative points of view for those problems or arguments; 3) drawing a conclusion; and 4) presenting the results and concepts or points of view in a reasonable way.

2.3.3 Theoretical frameworks of critical thinking skills

There are a few scholars who have proposed how people basically develop into critical thinkers by proceeding through a number of commonly experienced phases. Brookfield (1987) stated that there were five essential phases of critical thinking as follow:

Trigger Event refers to some unexpected happening which prompts a sense of inner discomfort and perplexity or doubt such as divorce, bereavement, unemployment, disability, forced-job change, and geographical mobility.

Appraisal refers to a period of self-scrutiny and appraisal of the situation which follows the trigger event. In this phase, we identify and clarify the concern, and engage in self-examination, and begin looking for those confronting a similar contradiction.

Exploration refers to searching for new ways of explaining these discrepancies or of living with them – ways that reduce our sense of discomfort. During this phase, we test out new ways of thinking and acting that seem more congruent with our perceptions of what is happening in our lives.

Developing Alternative Perspectives refers to ways of thinking and acting that have been tested and explored for alternatives and that we feel make sense for our situation. We select from identities, role models, and philosophies we have explored those assumptions and activities that seem most satisfactory and congruent with our relationships and ways of living.

Integration refers to a decision on the worth, accuracy, and validity of new ways of thinking or living. In this phase, we begin to find ways to integrate these into

the fabric of our lives. Resolutions range from tenuous and tentative solutions to satisfactory negotiations of conflict. Sometimes this integration involves transforming attitudes and assumptions. At other times it entails confirming, with a renewed sense of conviction, existing stances.

Another model in which certain aspects of critical thinking are developed is a model of revised Bloom's taxonomy suggested by Anderson et al. (2001). This model indicated that the six components of a cognitive process in educational objectives consisted of remembering, understanding, applying, analyzing, evaluating, and creating. For the remembering step, students could recognize knowledge in long-term memory and recall relevant knowledge from long-term memory. To demonstrate the understanding step, students could clarify from one form of representation to another, exemplify a concept or principle, categorize something into a category, summarize a general theme or major points, infer a logical conclusion from presented information, compare correspondences between two ideas, and explain a cause-and-effect model of a system.

For the applying step, students could execute a procedure for a familiar task and implement a procedure for an unfamiliar task. To engage the analyzing step, students could differentiate relevant from irrelevant parts or important from unimportant parts of presented material, organize elements of parts to fit into a structure, and attribute a point of view, bias, values, or intent underlying presented material. To participate in the evaluating step, students could check inconsistencies or fallacies within a process or product, the internal consistency of a process, and the effectiveness of the implemented procedure. Moreover, students could judge inconsistencies between a product and external criteria, the external consistency of a process, and the appropriateness of a procedure for a given problem. To encourage the creating step, students could generate alternative hypotheses based on criteria, plan a procedure for accomplishing some task, and construct a product.

Moreover, Garrison et al. (2000) proposed a Practical Inquiry Modal which presented how critical thinking skills take place in an educational context. A Community of Inquiry is composed of teachers and students - the key participants in the educational process and also the model of this Community of Inquiry assumes that learning occurs within the Community through the interaction of three core essential

elements: cognitive presence, social presence, and teaching presence. According to the concept of a community of inquiry of Garrison, Anderson, and Archer (2001), it is an extremely valuable context for higher-order learning. Cognitive presence is defined within the framework of a community of inquiry, but is grounded in the critical-thinking literature and is operationalized by the practical inquiry model, so it is important to recognize that cognitive presence focuses on higher-order thinking processes as opposed to specific individual learning outcomes. Therefore, Garrison et al. (2000) proposed a practical inquiry model that guides the methodology of this research on assessing cognitive presence (i.e., critical inquiry) in an online, computer-conference environment in studying the formal educational context.

The practical inquiry model is differentiated into four essential phases to describe and understand cognitive presence in an educational context (Garrison et al., 2001, p. 9) as follows:

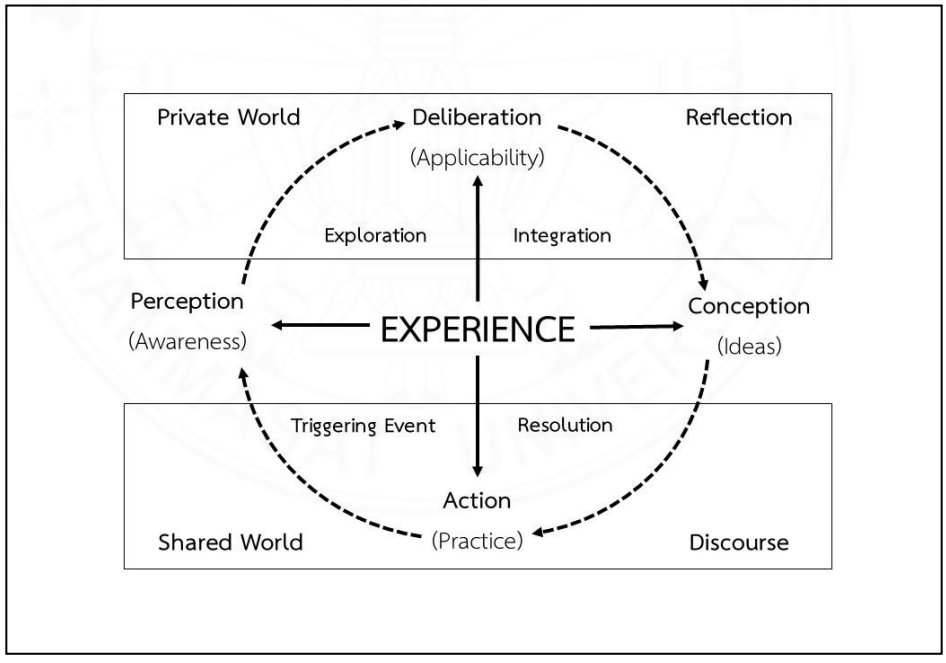

Figure 2.2 A Practical Inquiry Model

Noted. Adapted from "Critical thinking, cognitive presence, and computer conferencing in distance education," by D. R. Garrison, T. Anderson, and W. Archer, 2001, *American Journal of Distance Education, 15*(1), p. 9 (https://doi.org/10.1080/08923640109527071)

The first phase (lower left quadrant) of the model reflects the initiation phase of critical inquiry and is considered the triggering event. Here an issue, dilemma, or problem that emerges from experience is identified or recognized. In an educational context, the teacher often explicitly communicates learning challenges or tasks that become triggering events. However, in a more democratic and nonhierarchical application of computer conferencing, any group member may purposively or indirectly add a triggering event to the discourse. A critical role of the teacher (actualizing teacher presence) is to initiate, shape and, in some cases, discard potentially distracting triggering events so that the focus remains on the attainment of intended educational outcomes.

The second phase of the process is exploration. In this phase, participants shift between the private, reflective world of the individual and the social exploration of ideas. Early in this phase, students are required to perceive or grasp the nature of the problem, and then move to a fuller exploration of relevant information. This exploration takes place in a community of inquiry by iteratively moving between the private and shared worlds—that is, between critical reflection and discourse. At the end of this phase, students begin to be selective with regard to what is relevant to the issue or problem. This is a divergent phase characterized by brainstorming, questioning, and exchange of information.

The third phase, integration, is characterized by constructing meaning from the ideas generated in the exploratory phase. During the transition from the exploratory phase, students will begin to assess the applicability of ideas in terms of how well they connect and describe the issue or event under consideration. Again, students move repeatedly between reflection and discourse. This phase is the most difficult to detect from a teaching or research perspective. Evidence of the integration of ideas and the construction of meaning must be inferred from communication within the community of inquiry. This phase requires active teaching presence to diagnose misconceptions, to provide probing questions, comments, and additional information in an effort to ensure continuing cognitive development, and to model the critical thinking process. Often students will be more comfortable remaining in a continuous exploration mode; therefore, teaching presence is essential in moving the process to more-advanced stages of critical thinking and cognitive development.

The fourth phase is a resolution of the dilemma or problem by means of direct or vicarious action. In most non-educational settings, this means implementing the proposed solution or testing the hypothesis by means of practical application. In an educational context, however, the concept is somewhat more difficult. It usually entails a vicarious test using thought experiments and consensus building within the community of inquiry. As will be noted subsequently, progression to the fourth phase requires clear expectations and opportunities to apply newly created knowledge. Educationally, the end of this phase may require moving on to a new problem with the assumption that students have acquired useful knowledge.

In addition, Garrison et al. (2001, pp. 15-16) developed the guideline, including the descriptors, indicators, and socio-cognitive process to facilitate reliable categorization by coders which is presented in Table 2.3.

Table 2.3 A guideline to identify the categories in a Practical Inquiry Model

Descriptors	**Indicators**	**Socio-cognitive Processes**
Triggering events phase		
Evocative	-Recognizing the problem	-Presenting background information that culminates in a question
	-Sense of puzzlement	-Asking questions -Messages that take discussion in new direction
Exploration phase		
Inquisitive	-Divergence-within the online community	-Unsubstantiated contradiction of previous ideas
	-Divergence-within a single message	-Many different ideas/ themes presented in one message
	-Information exchange	-Personal narratives/ descriptions/ facts (not used as evidence to support a conclusion)
	-Suggestions for	-Author explicitly characterizes

Descriptors	Indicators	Socio-cognitive Processes
	consideration	message as exploration-e.g., "Does that seem about right?" or "Am I way off the mark?"
	-Brainstorming	-Adds to established points but does not systematically defend/ justify/ develop addition
	-Leaps to conclusion	-Offers unsupported opinions
Integration phase		
Tentative	-Convergence-among group members	-Reference to previous message followed by substantiated agreement, e.g., "I agree because…"
		-Building on, adding to others' ideas
	-Convergence-with a single message	-Justified, developed, defensible, yet tentative hypotheses
	-Connection ideas, synthesis	-Integrating information from various sources-textbooks, articles, personal experience
	-Creating solutions	-Explicit characterization of message as a solution by participant
Resolution phase		
Committed	-Vicarious application to real world	-None
	-Testing solutions	-Coded
	-Defending solution	-

Noted. Adapted from "Critical thinking, cognitive presence, and computer conferencing in distance education," by D. R. Garrison, T. Anderson, and W. Archer, 2001, *American Journal of Distance Education, 15*(1), p. 15-16 (https://doi.org/10.1080/08923640109527071)

According to mentioned models of critical thinking, they seem to have certain phases in commons, such as the triggering phase, exploration phase, and integration phase. Even though the rest of the phases in those models has been used in different terms, they have essentially similar components. However, the models to investigate critical thinking proposed by Garrison et al. (2001) and revised Bloom's taxonomy suggested by Anderson et al. (2001) seemed to be more precise and uncomplicated than the others because these models were appropriate to explore critical thinking skills in an educational context. Moreover, they provided remarkably clear and reliable descriptors, indicators, and examples of each phase to facilitate the researcher to categorize or code the data.

2.3.4 Advantages of critical thinking skills in ELT

There are a number of advantages of critical thinking in a broader sense proposed by certain scholars and educators. Critical thinking skills are relatively beneficial to every stage of life. Ordinarily, without the capacity to think and act critically, we would never move beyond the assumptions we assimilated uncritically in childhood, such as the myths, folk wisdom, and values we encountered in authority figures in our early lives (Brookfield, 1987). As a result, we would make no attempt to change social structures or to press for collective social action. Therefore, we have to promote critical thinking because the ability to be critically analytical concerning the assumptions underlying our own actions and those of others is organizationally and culturally beneficial as well as personally liberating (Brookfield, 1987).

In the educational context, Paul et al. (1989) found that most of the classes in most of the time, teachers are talking and actively engaged while students are listening passively, and their utterances are statements, not questions; as a result, the motivation to think of students is taken away by these actions. Consistently to the statement of Paul (1992), much academic learning is of a lower order: undisciplined, associative, and inert, so it is an obstacle rather than an aid to education. What students often learn well – that school is a place to repeat back what teachers or textbooks say and that to follow the correct steps in the correct order is to get the correct answer – blocks them from thinking seriously about what they learn. On the

contrary, higher-order learning multiplies comprehension and insight, stimulates and empowers the students, and provides a tool for acquiring knowledge.

As a consequence, learning patterns in education should be redesigned. Students learn to think by thinking, learn to learn by learning, learn to judge by judging and by assessing their thinking, learning, and judging – Does this make sense? Is this clear? Is it well reasoned?, so students come to use the power of their minds to clarify, judge, and reason (Paul et al., 1989). If schools and colleges do not shift their orientations from rote memorization to critical thinking, there is little possibility that significant change will occur outside of school (Paul, 1992).

According to the suggestion of Paul et al. (1989), good English instruction must respect and challenge students' attitudes. Students must assess for themselves the relative worth of popular entertainment and quality works and they need opportunities to scrutinize and evaluate the forms of entertainment they prefer. Furthermore, they need to assess the messages they receive from them, the conceptions of life they presuppose, and the values they manifest. Therefore, critical thinking can encourage students to refine their tastes, and we should encourage it with this end in mind. We want students to be sensitive to their language, striving to understand it and use it thoughtfully, accurately, and clearly. Besides, we require them to become autonomous thinkers and command rather than be commanded by language. To read critically, students familiarize themselves with different uses of language to enhance their understanding of and appreciation of literature. To write critically, students recognize the challenge of putting their ideas and experiences into words. That is, students engage in parallel tasks in writing to the ones in reading that organize, engage, and develop the mind, and that require the full and heightened involvement of critical and creative thought.

Benefits of critical thinking skills are suggested by Kelly (2001), including 1) autonomy – this involves being self-directed and in control, so we need to know who we are and what we are doing and why; 2) political literacy – this refers to voters being well informed and reflective concerning the important issues of the day, so we can hold the government accountable for its policies and actions; 3) social values – we require a shared set of values, traditions, and practices if there is to be social cohesion and stability and if we are to identify and respond to major social problems; 4) career

considerations – many jobs require the ability to solve problems and to think creatively and independently; and 5) practical considerations – critical thinking skills can greatly enhance the wisdom of our everyday choices.

Furthermore, Cottrell (2011) proposed that good critical thinking skills can bring numerous advantages including, 1) improved attention and observation; 2) more focused reading; 3) improved ability to identify the key points in a text or other message rather than becoming distracted by less important material; 4) improved ability to respond to the appropriate points in a message; 5) knowledge of how to get our own point across more easily; and 6) skills of analysis that you can choose to apply in a variety of situations.

Advantages of critical thinking are categorized into three domains (Bassham et al., 2002) as follows:

Critical thinking in the classroom – the focus is on higher-order-thinking skills such as the active, intelligent evaluation of ideas and information. Therefore, critical thinking plays a vital role throughout the college curriculum. In critical thinking course, students learn a variety of skills that can greatly improve their classroom performance, including 1) understanding the arguments and views of other; 2) critically evaluating those arguments and views; and 3) developing and defending one's own well-supported arguments and views;

Critical thinking in the workplace – increasingly, employers are looking not for employees with highly specialized career skills, since such skills can usually best be learned on the job, but for workers with good thinking and communication skills – quick learners who can solve problems, think creatively, gather an analyze information, draw appropriate conclusions from data, and communicate their ideas clearly and effectively. These are exactly the kinds of generalized thinking and problem-solving skills that a course in critical thinking is designed to improve; and

Critical thinking in life – critical thinking can help us avoid making foolish personal decisions and also help us to avoid such mistakes by teaching us to think about important life decisions more carefully, clearly, and logically. In addition, critical thinking plays a vital role in promoting democratic process because many of today's most serious societal problems – environmental destruction and declining educational standards– have largely been caused by poor critical thinking. Lastly,

critical thinking is worth studying for its own sake, simply for the personal enrichment and fulfillment it can bring to our lives. In other word, critical thinking allows us to lead self-directed examined lives.

According to mentioned advantages of critical thinking skills, learners, especially language learners should develop these skills because they could monitor, evaluate, and reflect critically on their thinking in their directions of language learning. Furthermore, critical thinking skills expand relatively both lifelong learning and working life of language learners as well as it is one of the various factors which carries out a high correlation to language learners' achievement.

2.3.5 Barriers of critical thinking skills in ELT

Certain researchers, scholars, and educators have discussed the barriers of critical thinking in both genetic and educational contexts. Generally, Kelly (2001) revealed that there are nine obstacles to think well, including 1) hidden assumptions – knowing what people are assuming when they argue in a particular situation helps us assess their argument; 2) emotions – being overly emotional makes it difficult to think clearly and reason well; 3) stereotypes – believing that an entire group of people is guilty of something that only one or two of its members do reflects a failure to reason carefully; 4) closed-mindedness – consistently refusing to admit that we might be mistaken, especially on controversial matters, blinds us to the truth; 5) the will to be right – failing to recognize that most of us prefer to win rather than lose arguments prevents us from recognizing better arguments by those with whom we disagree; 6) laziness – developing an informed and reasonable view on an important issue can be hard work; 7) worldview – becoming aware of what we believe and why makes it easier to evaluate whether our beliefs are reasonable; 8) enculturation – understanding that society plays a huge role in shaping how we look at the world around us helps us understand our worldview; and 9) the myth of objectivity – knowing something about how genetics, parents, peers, and society shape us suggests that it is unreasonable to think that we can look at the world objectively.

Furthermore, Cottrell (2011) stated the key barriers to critical thinking as follows:

Misunderstanding of what is meant by criticism – some people assume that criticism means making negative comments. As a result, they refer only to negative aspects when making an analysis. This is a misunderstanding of the term. Therefore, critical evaluation means identifying positive and negative aspects, what works as well as what does not;

Over-estimating our own reasoning abilities – we tend to believe our own belief systems are the best and that we have good reasons for what we do and think. Those who are good at winning arguments can mistake this for good reasoning ability, so imprecise, inaccurate, and illogical thinking does not help to develop the metal abilities required for higher-level academic and professional work;

Lack of methods, strategies, or practice – although willing to be more critical, some people don't know which steps to take next in order to improve their critical thinking skills. With practice, most people can develop their skills in critical thinking;

Reluctance to critique experts – there are be a natural anxiety about critically analyzing texts or other works by people that you respect. If this is true for you, it may help to bear in mind that this is part of the way teaching works in most English-speaking universities. Critical analysis is a typical and expected activity. Researchers and lecturers expect students to question and challenge even published material;

Affective reasons – emotional self-management can play an important part in critical thinking. To be able to critique means being able to acknowledge that there is more than one way of looking at an issue. In academic contexts, the implication of a theory can challenge deeply held beliefs and long-held assumptions. However, critical thinking does not mean that you must abandon beliefs that are important to you. It many mean giving more consideration to the evidence that supports the arguments based on those beliefs, so that you do justice to your point of view;

Mistaking information for understanding – learning is a process that develops understanding and insight. Many lecturers set activities to develop expertise in methods used within the discipline. Nonetheless, students can misunderstand the purpose of such teaching methods, preferring facts and answers rather than learning the skills that help them to make well-founded judgements for themselves; and

Insufficient focus and attention to detail – critical thinking involves precision and accuracy and this requires good attention to detail. Poor criticism can result from making judgements based on too general an overview of the subject matter. Critical thinking activities require focus on the exact task in hand, rather than becoming distracted by other interesting tangents.

A list of some of the most common barriers to critical thinking suggested by Bassham et al. (2002) including, lack of relevant background information; poor reading skills; bias; prejudice; superstition; egocentrism (self-centered thinking); sociocentrism (group-centered thinking); peer pressure; conformism; provincialism; narrow-mindedness; closed-mindedness; distrust in reason; relativistic thinking; stereotyping; unwarranted assumptions; scapegoating; rationalization; denial; wishful thinking; short-term thinking; selective perception; selective memory; overpowering emotions; self-deception; face-saving; and fear of change.

There have been serious problems relating to these type of skills in education and English language teaching contexts even though the stakeholders such as educators, teachers, scholars and even researchers have been developing and promoting these skills for the language learners. Those problems of critical thinking skills could be students' lack of higher order thinking skills and differentiating critical thinking from the lower-level intellectual abilities of understanding, remembering and applying (Halpern, 1998; Limpman, 1995; Tsui, 2006). Furthermore, there are other problematic factors relating to critical thinking skills, including 1) lack of critical thinking encouragement; 2) lack of the modelling of critical thinking; 3) poor methods of teaching writing; 4) unqualified teachers in ESL; 5) poor English language curriculum; 6) lack of questioning habits; and 7) lack of debates and discussion (Shaheen, 2012).

Meanwhile, there are three primary factors correlating with critical thinking skills, including 1) teaching and learning factors – teaching method, teaching materials, and teaching and learning environment; 2) learner factors – achievement, reading ability, achievement motivation, learning intentions, attitude to learn, and emotional quotient; and 3) individual and caring factors – individual, attitude and belief and behavior, caring (Mahapoonyanont, 2010).

According to mentioned findings, the problems of promoting critical thinking skills in English language learning could be caused by a curriculum and materials, language teachers, language learning activities, and learners themselves. Similarly, the students must be taught to think critically and a curriculum should be designed with instilling critical thinking skills, a metacognitive awareness, and repletion of thinking exercises (Mulnix, 2012). A number of research relating critical thinking skills could be implied that not only this type of skills becomes more important in language teaching and learning but also there are certain problems of promoting critical thinking skills for language learners.

2.4 Previous research studies on technology integration to promote students' critical thinking skills

A number of existing research studies during the last decade were investigated and classified into four primary research areas in this section, including teachers' beliefs and practices in ELT, technology integration in ELT, students' critical thinking skills in ELT, and utilizing technology to promote students' critical thinking skills in ELT. Firstly, certain studies have been conducted to explore teachers' beliefs and practices in English language teaching towards different focuses. The first main research focus in this area was language skills such as teaching vocabulary (Pookcharoen, 2016; Mirzaie et al., 2018) and teaching grammar (Hos & Kekec, 2014; Uysal & Bardakci, 2014; Morina, 2016). The key result indicated that even though the teachers had known what teaching strategies or approaches were appropriate for their instruction, they did not frequently those strategies or approaches in their instruction.

Another focus was instructional approaches in English language teaching. The results presented that teachers had highly positive views on different aspects of learner autonomy (Dogan & Mirici, 2017) and learner autonomy had a positive effect on success as language learners as well as allow language learners to learn more effectively (Borg & Al-Busaidi, 2011). However, it exposed that certain factors had less positive on learner autonomy, including learner factors (lack of motivation, lack of skills for independent learning, low proficiency in English), institutional factors (overloaded curriculum, limited resources to promote learner autonomy), and teacher

factors (lack of teacher autonomy, low expectation of what learners can achieve) (Borg & Al-Busaidi, 2011; Borg & Alshumaimeri, 2019).

Several studies underlying this area were conducted to examine teachers' beliefs of using technologies in English language teaching. The key result presented that integrating technology in English could promote students' motivation (Papayianni, 2012; Chamorro & Rey, 2013). However, the results of the studies exposed that certain factors related to promoting technology integration in English language teaching included extrinsic factors - lack of hardware and software, difficulty in accessing CALL facilities, intrinsic factors - teachers' beliefs about technology, and contextual factor – a great influence on teachers' CALL use (Papayianni, 2012). Furthermore, the results presented that four barriers to using technologies consisted of students' lack of computer skills, teachers' lack of technology training, teachers' lack of time to implement technology-integrated lessons, and teachers' lack of technical support (Hsu, 2016).

The last research focus regarding teachers' beliefs and practices in English language teaching was teacher professional development. The key result of research study on teacher education programs found that the program had a considerable impact on teachers' beliefs because it allowed teachers to think more explicitly, to articulate their beliefs, and to focus on the ways of developing classroom practices that reflected their beliefs (Borg, 2011). However, the results of Yook and Lee (2016)'s study indicated that teachers were dissatisfied with the theory-oriented pre-service teacher education program that they attended and the result also suggested that the major sources influenced on their instructional practices were their experience of the in-service teacher training program with practical curricula and observations of their other fellow teachers' teaching.

According to the results of the existing studies regarding teachers' beliefs and practices in ELT, it could be interred that teachers' beliefs and perceptions were relatively associated with instructional practices in their English language teaching. Beliefs and perceptions of the teachers could provide positive and negative effects on their language learning and teaching. Nonetheless, certain factors could significantly affect beliefs and perceptions of the teachers during into the instruction.

With regard to technology integration in ELT, certain research studies were conducted and concentrated on distinct focuses. Primarily the studies concentrated on teachers' perspectives towards the use of technology in English language teaching and the results exposed that teachers had positive perspectives of the technology integration in the language instruction (Saglam & Sert, 2012; Kazemi & Narafshan, 2014; Coskun & Marlowe, 2015). However, teachers encountered difficulties while utilizing technology in their classroom (Kazemi & Narafshan, 2014), and there were five themes relating to teachers' perspectives on technology integration in English language teaching, including the institution's view of technology, students' and teachers' background knowledge of technology, technological equipment, information and communication technologies, and professional experience (Ince, 2014).

Another research focus in this area was language learning development. The results of existing research studies found that integrating technology into English language teaching could promote students' motivation (Wu et al., 2011; Al-Mohammadi & Derbel, 2014). Moreover, the results indicated that it enhanced their confidence in what they learned (Wu et al., 2011) and their academic performance (Mohammadi & Derbel, 2014). Teacher professional development was the last research focus that the researchers conducted their research on technology integration in English language teaching. The results indicated that the integration of collaborative learning and technology-enhanced language learning was an intensely useful element in achieving the course goals (Reyes Fierro & Delgado Alvarado, 2015), but there were few ICT tools integrated into the textbooks (Hismanoglu, 2011). Furthermore, teachers utilized certain types of technology tools and some cutting-edge tools in their classrooms (Saenkhot & Boonmoh, 2019; Thanasitrittisorn & Boonmoh, 2020). Factors relating to teachers' technology integration in English language teaching were convenience, an enhancement to students' understanding, and stimulation to students' interest (Saenkhot & Boonmoh, 2019).

These results of the previous studies relating to utilizing technologies in ELT suggested that using technologies in English language learning and teaching offered positive assistance in terms of teachers' instructional practices and students' learning abilities. However, certain factors were considered as difficulties of technology integration in ELT.

In addition, the third research area of existing studies was critical thinking skills in ELT. Firstly, certain studies were interested in implementing different instructional approaches to promote students' critical thinking skills in English courses. The results of these studies revealed that critical thinking skills could be observed after learning through the implemented instructional approaches - critical thinking-enhanced activities (Yang & Gamble, 2013), critical thinking-enhanced instructional model (Vong & Kaewurai, 2017), different reading activities (Heidari, 2020). However, there were some factors - cultural factors, institutional factors, limitations of students' English language proficiency (DeWaelsche, 2015), and internal obstacles (classroom and time management, effective instruction in L2, students' unfamiliarity with critical thinking-oriented activities), and external obstacles (the educational system or the students) (Petek & Bedir, 2018) that impacted students' critical thinking skills through implemented learning strategies.

Another research focus in this area was developing language skills and students' critical thinking skills. The results of existing studies indicated that using reading activities in English language classrooms could enhance critical thinking skills (Bunsom et al., 2011; Wang & Seepho, 2016; Yooprayong et al., 2017). Moreover, certain previous studies were conducted to investigate promoting language skills such as reading skills (Sarot et al., 2016), communicative skills (Ruksapon, 2017), and speaking skills (Arjpru, 2020) through critical thinking-based activities. Their results exposed that students' language skills were improved after participating in those developed activities. Another existing study implemented collaborative writing activities to promote university students' critical thinking skills and its results asserted that students with high levels of English ability thought critically by analyzing, evaluating, and creating while students with intermediate and low levels of English ability practiced their critical thinking by analyzing and evaluating (Moonma & Kaweera, 2022).

Assessing students' critical thinking skills and developing a rubric for critical thinking assessment were the last focuses underlying this area. The results of research studies indicated that students had a positive attitude towards critical thinking skills (Warabamrungkul et al., 2018; Din, 2020). Nonetheless, their critical thinking skills were at a low level; that is, they did not correspond with their attitude

towards critical thinking skills (Ploysangwal, 2018; Din, 2020). Another previous study was conducted to develop a critical-thinking-in-argumentative-essay rubric and its results revealed that this rubric consisted of six clear and valid domains for assessing critical thinking skills in an argumentative essay and it could be used to promote learning and critical thinking skills for EFL students (Nakkaew & Adunyarittigun, 2019)

The results suggested from the existing studies regarding critical thinking skills in ELT indicated that critical thinking skills could be enhanced through language learning activities with different instructional approaches and language skills. Moreover, aspects of critical thinking skills that were frequently promoted in the activities consisted of analyzing and evaluating skills.

The last research area of the existing studies was utilizing technology to enhance students' critical thinking skills in ELT. The predominant research focus in this area was implementing different specific technologies integrated into instructional activities to promote critical thinking skills. The previous study synthesized a number of research articles regarding using technologies to foster critical thinking skills in ELT (Liang, 2023). The results indicated that technologies were mostly utilized to develop students' critical thinking skills in terms of analysis and evaluation. Those aspects of critical thinking skills were mostly promoted through informative and communicative technologies.

A particular technology which was frequently implemented in English language classrooms was digital storytelling (Yang & Wu, 2012; Thang & Mahmud, 2017; Alshaye, 2021). The results from these previous studies suggested that digital storytelling could successfully promote critical thinking skills. However, further results regarding using different tasks of digital storytelling were proposed. The result derived from quantitative and qualitative data indicated that high school students performed better in terms of English achievement and learning motivation after learning through digital storytelling in the English classroom (Yang & Wu, 2012). Moreover, the result derived from the interviews and surveys indicated that undergraduate students in Malaysia perceived certain benefits in terms of English language skills, ICT literacy skills, and collaborative skills (Thang & Mahmud, 2017). The result gathered from quantitative data, including pretest-posttest and

questionnaire presented that the third-year undergraduate students' critical reading skills and self-regulated skills were significantly improved (Alshaye, 2021).

With regard to using online courses to foster critical thinking skills in ELT, certain previous studies such as those related to online and blended courses (Akyol & Garrison, 2011), an intelligent learning system (Chen & Hu, 2018), and an online EFL course (Akatsuka, 2020) were conducted. Consistently, the results from these studies suggested that certain aspects of critical thinking skills, namely integration, interpretation, and inference were profoundly promoted through learning online courses. However, another result regarding this technology for language learning and teaching was provided. The result derived from quantitative and qualitative data asserted that graduate students' cognitive presence and the quality of learning outcomes were connected (Akyol & Garrison, 2011).

Online discussions were considered one of the specific technologies which were frequently utilized in English language instruction to allow students to think critically. The previous studies which were conducted with this focus consisted of online case discussions with questions based on the Practical Inquiry Model (Sadaf & Olesova, 2017), asynchronous discussion forums (Al-Husban, 2020), and online discussion forums (Jamali & Krish, 2021). Similarly, the results from these existing studies indicated that students' aspects of critical thinking skills, namely exploration and integration were improved after participating in the online discussions. However, further results were provided by some studies. The result of the study employing a case study research design to collect the data revealed that in-service teachers who engaged in the online discussion forums needed to improve their additional aspects of critical thinking skills such as justification, critical assessment, evaluating problems, and integrating solutions into their existing knowledge ((Al-Husban, 2020). Moreover, the result of the study implementing a case study research design to gather the data suggested that using online discussion forums could be constructive for facilitating English language learning and promoting 21st century skills such as leadership and digital skills (Jamali & Krish, 2021).

Certain digital teaching aids were utilized to enhance students' critical thinking skills in English language teaching, including online resources (Zhang, 2018), videos (Mete, 2020), and mobile applications (Haerazi et al., 2020). Similarly,

the results from these previous studies identified that undergraduate students' critical thinking skills were developed after utilizing those aids. Nonetheless, further results regarding integrating digital teaching aids in language classrooms were demonstrated. The result of the study implementing a case study research design indicated that EFL college Chinese students improved their critical thinking skills through academic writing by analyzing and evaluating the interrelationship between language features and the content from the texts (Zhang, 2018). Consistently, the result of the study implementing a qualitative research approach to collect the data affirmed that EFL university students' aspects of critical thinking skills, namely applying, analyzing, and evaluating were improved through participating in the language learning activities with videos (Mete, 2020). Moreover, the result of the study gathering the quantitative and qualitative data revealed that pre-service teachers' writing skills could be improved by constructing complete descriptive texts with mobile-assisted language learning activities (Haerazi et al., 2020).

Lastly, digital devices such as tablets which could be considered one of focuses on employing technologies to foster critical thinking in language learning were implemented to promote students' critical thinking in the classrooms (Reychav et al., 2015; Bagdasarov et al., 2017). The results of these existing studies indicated that using tablets provided a positive effect on promoting critical thinking skills. However, further results relating to employing tablets to foster critical thinking skills were presented. The result derived from surveys identified that it led the better outcomes in terms of learning strategies, including rehearsal, elaboration, and organization for undergraduate students (Reychav et al., 2015). Furthermore, integrating tablets into the classrooms was beneficial for different communication skills - oral communication, written communication, and graphical communication (Bagdasarov et al., 2017).

Nonetheless, the students' factor that directly affected their higher-order thinking in technology-enhanced learning activities was the deep learning approaches, and two others that indirectly influenced the students' higher-order thinking through the student's deep learning approach were epistemological beliefs and attitude toward technology use (Lee & Choi, 2017).

According to the existing studies regarding integrating specific technologies to develop different aspects of critical thinking skills in English classrooms, the results elucidated that students could improve their critical thinking skills through technology-implemented language learning activities. Furthermore, some factors that influenced technology integration to promote critical thinking skills were suggested.

To synthesize the literature and the results of the existing research studies in all areas, three fundamental factors influenced teachers' instructional practices in the classrooms, including teacher-related factors, student-related factors, and other-related factors. Furthermore, the support to promote technology integration into the classrooms consisted of financial aid, technological resources, time providing, professional development and training, technical assistance, and a positive environment for technology use.

To summarize the research gap derived from the mentioned research areas of the existing studies, the first area of the existing research studies in teachers' beliefs and practices in English language teaching focused on exploring language skills, instructional approaches, technology integration, and teacher professional development. Therefore, there was a lack of the research study regarding promoting students' critical thinking skills with technology-implemented language learning activities. Another area of the existing research studies in technology integration in English language teaching indicated that they were conducted to investigate teachers' perspectives on technology integration, language learning development, and teacher professional development. Consistently, the previous studies in this area did not pay more attention to students' critical thinking skills.

The third area of the existing research studies in students' critical thinking skills in English language teaching concentrated on examining instructional approaches toward critical thinking skills, promoting critical thinking skills through language skills, and assessment for critical thinking skills. Therefore, enhancing students' critical thinking skills with technology integration was not adequately investigated. The last area of the existing research studies in integrating technologies to promote students' critical thinking skills in English language teaching argued that the existing research studies were conducted by using different specific technologies in the context of the university level. Different research approaches were implemented

to conduct those studies such as quantitative research approach and mixed-method research approach. However, even though qualitative research design such as a case study was employed to conduct certain existing studies, the qualitative research design, namely phenomenological research design was not implemented to explore lived-experience of integrating technologies to promote critical thinking skills in English language teaching.

According to the research gaps mentioned above, there were several reasons why the researcher was interested in conducting the present study. Firstly, there were certain research studies conducted to promote students' critical thinking skills with particular technologies. Most of the existing research studies examined the effects of utilizing specific types of technologies to enhance critical thinking skills in ELT. As a consequence, the present study was conducted to provide certain insights regarding what technologies were implemented and how EFL university teachers integrated them into their instruction. Secondly, the existing research studies were primarily conducted with a quantitative research approach and mixed-method research approach. Certain studies implemented a qualitative research approach in their studies such as a case study. As a result, a qualitative research approach, especially a phenomenological research design was employed to conduct the present study to perceive teachers' and students' experiences of technology utilization to promote critical thinking skills in English language activities.

Thirdly, the existing research studies relating to using particular technologies to promote students' critical thinking skills were conducted at the university level in different contexts, for instance, the United States of America, the United Kingdom, Turkey, China, Indonesia, and Malaysia. No previous research study was conducted to explore employing a wide range of technologies to foster critical thinking skills at the university level in Thailand. Therefore, the present study was conducted at the university level to address the literature in the field. Moreover, the results of the study would offer evidence that students should be trained and practice utilizing several technologies and critical thinking skills while they were studying in certain courses, especially English language courses in universities.

According to the research gaps mentioned above, the researcher believed that the results of the present study could be constructive for EFL teachers and educators

to perceive what technologies EFL university teachers and how they used those technologies to promote students' critical thinking skills in the classrooms. In terms of professional development, the teachers and educators could apply the results as guidance in employing a variety of technologies to allow students to think critically in English learning activities. Furthermore, the researcher as an EFL university teacher used to be a part of course developers to create English courses in the language and communication in the general education courses (GenED) and encountered that technology integration and critical thinking skills were not emphasized in any criteria or pedagogical methods even though explicitly specified in the national education plan (2017-2036). The researcher believed that the results of the present study could be helpful in terms of curriculum and course development to promote certain aspects of critical thinking skills in technology-implemented language learning activities.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter aims to describe the overview of the research methodology employed in the present study. It is comprised of nine primary sections, including research context, research design, participants, research instruments, data collection, data analysis, background of the researcher, trustworthiness, ethical consideration, and the pilot study.

The objective of the present study were to explore the essence of teachers' technology integration to promote students' critical thinking skills and to explore students' perceptions towards learning with technology integration to promote their critical thinking skills. To understand this phenomenon, the present study was conducted to answer the following research questions:

Aspect 1: EFL university teachers' lived experiences in integrating technologies to promote Thai EFL university students' critical thinking skills

1.1 What types of technology do teachers integrate into their instruction to promote students' critical thinking skills?

1.2 How do teachers integrate technologies into their instruction to promote students' critical thinking skills?

1.3 How effective do teachers perceive their technology integration to be in promoting students' critical thinking skills?

1.4 What problems do teachers encounter when integrating technologies into their instruction to promote students' critical thinking skills?

1.5 How do teachers solve the problems that they encounter when integrating technologies to promote students' critical thinking skills?

1.6 What are the factors that influence teachers' technology integration to promote students' critical thinking skills?

Aspect 2: Thai EFL university students' perceptions towards learning with technology integration to promote their critical thinking skills

- What are students' perceptions towards learning with technology integration to promote their critical thinking skills?

3.1 Research context

The present study was conducted at one of Rajabhat universities in the western region of Thailand. Teachers working at this institute were responsible to teach English courses in the language and communication of general education courses (GenEd). English courses in the general education courses – a new curriculum 2020 were designed and divided into two main tracks, including English courses for teacher education programs and other programs. Teacher education programs refer to the students majoring in mathematics teacher program, English teacher program, and so on. For other programs, the students could study in nursing program, science programs, and so forth. There are six English courses for students studying in teacher education programs, including three credit courses and three non-credit courses. Particularly, the last English course in this track was designed to teach English for specific purposes such as English for Math Teachers to promote students' English proficiency in their specific subjects. Furthermore, students who are studying in other programs have to study five English courses, including three credit courses and two non-credit courses.

The content of complete English courses in the general education courses was designed based on the Common European Framework of References for languages (CEFR) and was ranged from A2 to B2, which each level of CEFR is for two courses. The primary learning objective for the entire English courses was to provide the students opportunities to practice their English language skills for communication in different contexts; as a consequence, the key focuses of all English courses are four skills – listening, speaking, reading, and writing. Furthermore, the instructional methods and activities employed in the classrooms were based on Communicative Language Teaching Approach (CLT). The evaluation of all English courses is comprised of 10% for class attendance, 30% for individual assignments that are divided into 10% for listening assignment, 10% for reading assignment, and 10% for writing assignment, 30% for quizzes that are separated out 10% for listening test and 20% for speaking test, 10% for a group presentation, and 20% for a final exam.

It could be seen that critical thinking skills were not the primary concentration for the complete English courses in the general education courses here because firstly the courses were predominantly designed for integrated skills. That is, teachers would promote students' English language skills, including listening, speaking, reading, and

writing skills through learning challenges or tasks. Secondly, the university policy focused on students' outcomes, so the teaching methods for the courses would emphasize student's practices through a variety of different classroom activities and assignments that allowed students to regularly practice their English language skills. Finally, critical thinking skills would be taught, especially in advanced English courses or tailor-made English courses.

Nonetheless, the students could not achieve those learning challenges, tasks, or even assignments without critical thinking skills for certain reasons. Firstly, the students would lose their motivation to learn actively and to think critically about whether teachers' instructional practices and utterances were statements without language learning activities which promoted students' questioning, exploring, and analyzing. Secondly, students' attitudes should be respectfully challenged. That is, students had to assess the relative worth of quality works, the form of quality works they preferred, and the message they received from quality works. Therefore, teachers had to pay more attention to promoting students' critical thinking skills throughout their instruction for all English courses in the general education courses. In terms of students' advantages, students' English language abilities, critical thinking skills, and technology skills could be simultaneously improved through various language learning activities.

This research site was purposefully selected for certain reasons. Firstly, the mentioned English course evaluations in GenEd at this Rajabhat University indicated that critical thinking skills were not adequately highlighted when considering the course assignments even though these skills were significant for EFL students' academic achievement. However, it could not be completely inferred that students' critical thinking skills were not promoted because students could foster their critical thinking skills through different processes of language learning activities in the classrooms. Therefore, it would be better to provide an insight into how critical thinking skills were promoted through technology-implemented language learning activities at this Rajabhat University.

Secondly, certain technology classroom facilities provided by this Rajabhat University were equipped for instruction in each classroom, including a microphone, speakers, projector and screen, and the university Wi-Fi. Nonetheless, some of these facilities were not appropriately maintained for learning and teaching. According to the

researcher's experience regarding technology classroom facilities, the microphone and its wire were broken; as a result, the instructors had to utilize their microphones for their instructional practices. Sometimes, the instructors encountered the problem of the Internet while they were implementing online software or applications in their language learning activities. Consequently, it would be constructive to explore what technologies were integrated into ELT to promote critical thinking skills at this research site because the results of the study could be used as evidence for developing positive technology-driven learning and teaching environment for ELT.

Eventually, this research site was selected in terms of convenience to access the research site and understanding its characteristics. The researcher has been working at the research site for nearly eight years. Furthermore, the researcher used to be the head of the academic department at the Language Institute of this Rajabhat University and participated in designing English courses for the new curriculum 2020 in the language and communication of general education courses (GenEd). Therefore, it would be convenient for the researcher to access the site and collect the data from the participants. Furthermore, the researcher has experienced and comprehended ELT with technology integration and how it should be developed in terms of promoting students' critical thinking skills in language classrooms.

With regard to technologies in the research site, fundamental technology classroom facilities were provided for instruction in each classroom, including a microphone, speakers, a projector, and a screen. There was no personal computer or laptop provided in the classrooms. Therefore, those who taught at this research site were required to employ their laptops for instructional practices. Nonetheless, certain mentioned technology devices provided in some classrooms were not well maintained for teaching and learning activities, such as broken microphones and projectors. Consequently, certain teachers had to bring their microphones to effectively facilitate their learning activities in ELT.

In terms of teachers' technology devices, certain devices such as mobile phones and tablets were implemented to facilitate instructional practices. For instance, teachers could employ their mobile phones to assess students' responses or engagement from different sides of the language classrooms. Moreover, teachers could use their tablets with laptops to deliver the content of the language lessons for their instruction.

Regarding students' technology devices, students were allowed to utilize their mobile phones and tablets for participating in the language learning activities. For instance, students could explore the meanings of new words that they encountered in the lesson. Furthermore, the students could use their devices to actively share responses and opinions for certain learning activities.

The other issue relating to technology integration is software or applications which were implemented in English language activities. The primary software which teachers employed to deliver their lessons was courseware because English commercial books were used for all English courses in the GenEd courses. The courseware provided colorful pictures, videos, audio, and multimedia materials for different learning activities. It was relatively convenient for teachers to appropriately prepare their instruction. Furthermore, certain online resources were integrated to supplement in order to promote students' motivation and participation. There were a wide range of online applications which teachers implemented in their language learning activities with different purposes. To assess students' comprehension of the lessons relating to target vocabulary and grammar, teachers utilized software that was available in online resources such as Kahoot, Quizzes, Booklet, and Edform. These online applications provided a number of language exercises that teachers directly adapted to their instruction. Furthermore, they allowed teachers to construct their online exercises and quizzes for their learning activities with limited functions.

To encourage students to practice their English listening skills, some online applications that teachers implemented for English listening activities consisted of YouTube and Edpuzzle. Certain teachers preferred to employ Edpuzzle for listening activities because a set of questions could be embedded in different parts of the selected videos to assess students' comprehension and it provided the achievement scores at the end of the activities. To foster students to practice English writing skills, software that was available in online resources was implemented such as Grammarly and VistaCreate. Students could use Grammarly to assess whether their English language in the writing tasks was grammatically appropriate. Moreover, VistaCreate which was a graphic design resource provided students with a large number of online templates to conduct creative writing tasks. To enhance students to share their ideas and perceptions, some software was integrated into the language learning activities, including Padlet,

Slido, Jamboard, and Mentimeter. This software allowed teachers to provide their topics through online platforms and immediately collected students' responses and opinions toward those topics.

3.2 Research design

The study aimed to explore the essence of teachers' technology integration to promote students' critical thinking skills and to investigate students' perceptions of learning with technology integration to promote their critical thinking skills. Consequently, phenomenological research, which is one of the qualitative research methods, was employed to explore mentioned topic under the current study because it perfectly fit the objectives of the study and facilitated the researcher to answer research questions to understand the individual experiences of the phenomenon. Generally, the characteristics of qualitative research were relatively appropriate for the present study in terms of visiting the natural setting, employing multiple sources of data, implementing inductive and deductive data analysis, and learning participants' meanings of the phenomenon.

Basically, qualitative research encourages the researchers to collect the data in the setting where the participants experience the issues under the study (Creswell, 2013, p. 45; 2014, p. 185). The participants are not invited to a lab nor are they asked to individually complete the provided instruments. Consequently, the researcher in the present study would collect the data by communicating directly to teachers who have been teaching English courses in the language and communication of general education courses and observing their instructional practices within the context. Moreover, the researcher would have face-to-face conversations with students to gather their perceptions of teachers' instructional practices regarding the phenomenon. According to this characteristic of qualitative research, it could thoroughly assist the researcher to construct a description of participants' experiences regarding the phenomenon under the study.

Another significant characteristic of qualitative research is collecting multiple forms of data. Qualitative researchers ordinarily collect the data through serval sources, for example, interviews, observations, documents, and audiovisual information, rather than rely on a single data source (Creswell, 2013, p. 45; 2014, pp. 185-186). Therefore,

the researcher would employ different research instruments to gather multiple forms of data. That is, several semi-structured interviews with online meeting program would be conducted for teachers and students to explore their experiences of the phenomenon under the study. In addition, a classroom observation would be administered to investigate teachers' and students' behaviors and interactions with the instructional practices. The researcher would review all of the data, make sense of it, and inductively and deductively identify it into themes that triangulate all data sources.

Analyzing inductively and deductively the data, which is one of the attributions of qualitative research, facilitates the researchers to construct categories or themes from the bottom up by organizing the data inductively into more abstract units of information (Creswell, 2013, p. 45; 2014, p. 186). This characteristic is relatively constructive for the present study because the researcher worked back and forth between themes and the database until the comprehensive set of themes is organized. Furthermore, the researcher was required to take account of the data from themes to determine whether all available evidence was sufficient to support each theme and additional data was needed. The process of inductive and deductive data analysis encouraged the researcher to develop a complex understanding description of the phenomenon under the study.

Eventually, qualitative research encourages the researchers to concentrate on learning the meaning that the participants possess about the phenomenon, not the meaning that the researchers convey to the research or that writers express in the literature (Creswell, 2013, p. 47; 2014, p. 186). Therefore, the researcher focused on participants' lived experiences and their meanings of integrating technologies to promote students' critical thinking skills in terms of technologies and how they were integrated into ELT, challenges and solutions when utilizing technologies in ELT, and the effectiveness of instructional practices with technology integration and influential factors. Moreover, students' perspectives and their experiences with teachers' teaching and learning with technologies were concentrated to develop a better comprehension of the phenomenon.

According to mentioned characteristics of qualitative research, it could be seen that this research methodology could be most appropriate and offers an effective approach for describing and understanding the topic under the present study.

Specifically, a phenomenological research approach, which is one of the diverse qualitative approaches, was adapted to capture the complexities of the phenomenon in the present study.

3.2.1 Definitions of phenomenological research

The term *Phenomenology* first originated in the eighteenth century in Christian Wolff's school in association with analogous developments and this concept was found in Kant (Heidegger, 2005, p. 3). Numerous scholars have attempted to provide definitions of phenomenology. This approach involves a return to experience to gather comprehensive descriptions that provide the basis for a reflective structural analysis that portrays the essences of the experience (Van Kaam, 1966, p. 15). Similarly, phenomenology is the systematic attempt to disclose and explicate the structures, the internal meaning structures, of everyday or lived experiences. A universal or essence may only be intuited or grasped through a study of the particulars or instances as they are encountered in lived experiences (Van Manen, 1990, p. 10). Moustakas (1994) asserted that the predominant target of phenomenology is to understand the meaningful concrete relations that implicit in the original description of experience in the context of a particular situation. Specifically, Heidegger (2005, p. 4) defined phenomenology means 'to show itself' or 'something that shows itself', and he provided an additional explanation as follows:

> Phenomenology means to let what shows itself be seen from itself, just as it shows itself from itself. That is the formal meaning of the type of research that calls itself "phenomenology". But this expresses nothing other than the maxim formulated above "to the things themselves". (Heidegger, 2010, p. 3)

Consistently, Creswell (2013, p. 76) suggested that a phenomenological study describes the common meaning for serval individuals of their lived experiences of a concept or a phenomenon, and phenomenologists focus on explicating what all participants have in common as they experience a phenomenon. According to mentioned widely accepted definitions, they seem to suggest that phenomenological research describes the essence or meaning structure of individuals or instances who

encounter lived experiences of the phenomenon through an original comprehensive description.

A phenomenological research methodology, thus, navigated the present study as a research framework to obtain a deep and complex comprehension of teachers' technology integration to promote students' critical thinking skills in ELT regarding technologies utilized and instructional practices with technology integration, challenges and solutions when employing technologies, and the effectiveness of instructional practices with technology integration and influential factors. In addition, this research method facilitated the researcher to explore students' perceptions of instructional practices with technology integration. The rich descriptions for two groups of participants would be developed to disclose and explicate the essence of the phenomenon.

3.2.2 Characteristics of phenomenological research

Basically, there are numerous characteristics of phenomenological research depending on the disciplines. Moustakas (1994) provided common qualities of this research approach from his psychological perspective. Phenomenological research is identified as a study of the wholeness of human experiences. Furthermore, this approach explores the meanings and essences of experiences through descriptions of experiences by obtaining first-person accounts in informal and formal conversations and interviews. The data of experiences is considered as imperative in understanding human behavior, and experiences and behavior are viewed as an integrated and inseparable relationship of subject and object and of parts and whole. Moreover, perceiving some common experiences of several individuals can be valuable for diverse groups such as therapists, teachers, and policymakers (Creswell, 2013, p. 82).

Van Manen (2016, p. 27) suggested certain characteristics of phenomenology based on a human science orientation, and some of them are similar to Moustakas's in the sense that phenomenological research begins with wonder at what gives itself and how something gives itself. In addition, the objective of this approach is to grasp the singular aspects of a phenomenon or event such as identity, essence, and so on. However, the different characteristic of Van Manen's is that there are two primary procedures of phenomenology – the Epoche (bracketing) and the reduction, which are

the two most critical components of the various forms of the reduction. Phenomenological reflection and analysis happen frequently in the attitude of the epoche and the reduction. Meanwhile, Moustakas (1994) proposed different ideas in terms of Van Manen's primary procedures. The Epoche is a process to set aside predilections, prejudices, and predispositions for obtaining new knowledge and experience while the bracketing is a part of the phenomenological reduction to place the focus of the research in the bracket so that the entire research process is solely originated on the topic.

Creswell (2013) demonstrated predominant characteristics and clear explanations that rely on Van Manen (1990)'s and Moustakas (1994)'s. Therefore, these characteristics would be employed as a specific guideline to conduct the present study. Initially, phenomenological research emphasizes exploring a phenomenon in terms of a single concept or idea (Creswell, 2013, p. 78). That is, the phenomenological researchers will focus on one notion, for example, the education idea of professional growth. Therefore, the present study concentrated on exploring the concept of promoting critical thinking skills through technology integration in ELT.

Secondly, another characteristic of phenomenological research is an exploration of the phenomenon with a group of individuals who have all experienced the phenomenon, and the size of the heterogeneous group might vary from 3 – 4 individuals to 10 – 15 (Creswell, 2013, p. 78). However, Polkinghorne (1989) suggested that the researchers should interview from 5 to 25 individuals who have all experienced the phenomenon. Thus, the participants for the present study were purposefully sampled with criteria and the numbers of them were approximately 16 EFL university teachers and 16 Thai EFL university students in order to investigate their lived experiences of the phenomenon with multiple perspectives from diverse groups.

Thirdly, collecting the data that involves primarily interviewing individuals who have experienced the phenomenon is considered as one of the predominant characteristics of phenomenological research. Nonetheless, some studies with this approach involve several sources of data, such as poems, observations, and documents (Creswell, 2013, p. 79). Therefore, the researcher employed an in-depth interview as a primary research instrument to explore teachers' and students' lived experiences of the phenomenon. Furthermore, an observation would be administered to explore teachers'

and students' behaviors and lived experiences of the phenomenon in the authentic setting. The data gathered from both research instruments would be triangulated to disclose and explicate the essence of lived experiences of the phenomenon.

Eventually, analyzing data in phenomenological research moves from the narrow units of analysis to broader units and on to detailed descriptions. These descriptions include a textural description of the experiences of the individuals (what the participants experienced), a structural description of their experiences (how they experienced them), and a combination of the textual and structural descriptions to convey an overall essence of the experience (Moustakas, 1994, Creswell, 2013, pp. 79-80). Therefore, the researcher implemented the process of phenomenological data analysis to construct the textual and structural descriptions to discuss what teachers and students experienced in terms of promoting critical thinking skills through technology integration in ELT and how they experienced it. Moreover, the researcher developed the descriptive passage incorporating those two descriptions to reveal the essence of the lived experiences for individuals.

3.3 Participants

Basically, a nonrandom sampling method is a process of selecting a sample using a technique that does not permit the researcher to specify the probability or chance that each member of a population has of being selected for the sample. One of the nonrandom sampling methods is a purposeful sampling technique which is a process of selecting a sample that is believed to be representative of a given population (Gay et al., 2012, pp. 140-141). The concept of the purposeful sampling technique is often employed in qualitative research (Creswell, 2013, p. 156; Creswell, 2014, p. 189; Marshall & Rossman, 2016, p. 225). That is, the inquirer selects individuals as good key informants or sites for study because they can purposefully provide an understanding of the phenomenon in the study (Creswell, 2013, p. 156, Creswell, 2014, p. 189). The characteristics of good key informants consist of the ability to be reflective and thoughtful, to communicate effectively with the researcher, and to be comfortable with the researcher's presence at the research site (Gay et al., 2012, p. 142). This sampling technique was implemented for the present study because it allows the researcher to select the participants based on the researcher's prior knowledge and

experience of EFL university teachers that meet the criteria. In addition, it best helps the researcher to understand the phenomenon of the study and to answer the research questions (Creswell, 2014, p. 189).

The number of individuals who involves in qualitative research depends on the research design. Creswell (2014, p. 189) suggested that the participants in phenomenological research typically range from 3 to 10 individuals. In addition, the size of the individuals could differ from 3 – 4 to 10 – 15 individuals (Creswell, 2013, p. 78). Nonetheless, those who have encountered the phenomenon could be interviewed from 5 to 25 individuals (Polkinghorne, 1989). According to the mentioned sample size, it could be seen that the participants who have encountered the phenomenon could range from 3 to 25 individuals. Thus, the participants who experienced the phenomenon of integrating technologies to promote critical thinking skills in ELT would be approximately 16 EFL university teachers and 16 Thai EFL university students. However, the size of the participants could be more or less than 16 individuals for each group because it depended on the redundancy of the data, known as data saturation (Gay et al., 2012, p. 143; Creswell, 2014, p. 189). That is, the researcher collected the data from the participants, and they did not reveal new insights, thoughts, and perspectives regarding the phenomenon of technology integration to promote critical thinking skills in ELT. Nonetheless, 8 voluntary teachers, who were from the group of EFL university teachers, were observed to collect the data that emerges in the English classes. An overview of sample size for the present study was demonstrated in Table 3.1.

Table 3.1 A number of the participants in the present study

Groups of the participants	**Number of the participants n = 31**	**Number of the participants who engage in the in-depth interview**	**Number of the participants who engage in the observation**
EFL university teachers	16	16	8
Thai EFL university students	16	16	-

There were two primary groups of participants in the present study. The first group was EFL university teachers and the other group was Thai EFL university students. The research setting for the present study would be Language institute at one of Rajabhat universities in the western region of Thailand. Language institute is predominantly responsible for teaching English courses in the language and communication of general education courses (GenEd). For a new curriculum 2020, there are three credit English courses and three non-credit English courses for students majoring in teacher education programs while the students who study in other program such as nursing program will learn three credit English courses and two non-credit English courses. The primary materials that are commonly employed for these English courses are commercial books with courseware. The reasons of using commercial materials are to reduce the time of teaching preparation, to facilitate the instructors to present the lesson with technology, and to increase students' motivation with colorful course books and additional online supplementary materials such as audiovisual materials.

The number of EFL university instructors who have been working at Language institute in one of Rajabhat universities in the west of Thailand consisted of 31 people, divided into 15 males (48.39%) and 16 females (51.61%). In terms of EFL university teachers' nationalities, the majority of the participants was Thai (N = 15, 48.39%) whereas 10 participants (32.26%) were Filipino. The rest of the participants were Burmese, Cambodian, Indonesian, American, British, and Australian. Regarding teachers' educational background, the majority of the participants had master's degree (N = 16, 51.61%) while the rest of participants received bachelor's degree (N = 13, 41.94%) and doctoral degree (N = 2, 6.45%). To include 16 participants for the present study, the criteria of participant selection were 1) to be a full-time EFL university teacher, 2) to possess at least a year of teaching experience at a higher education level, 3) to teach at least one English course in GenEd course in the semester 2 academic year 2022, 4) to experience the phenomenon of integrating technologies to promote critical thinking skills in ELT, and 5) to be willing to participate in the present study. Nonetheless, the participants were excluded from the present study in terms of unsatisfying the defined inclusion criteria and not having time to engage in the provided activities during the data collection. Furthermore, they could abruptly withdraw from

the present study without any permission from the researcher. The background information of teachers and their comprehension towards technology integration and critical thinking skills was discussed below.

Table 3.2 A personal background information of EFL university teachers

Number of participants	Nationalities	Educational background	Teaching experiences at university level (years)
T1	Thai	Master's degree	12
T2	Thai	Master's degree	16
T3	Thai	Master's degree	8
T4	Thai	Master's degree	8
T5	Thai	Master's degree	7
T6	Thai	Master's degree and now studying in Doctoral degree	6
T7	Thai	Master's degree and now studying in Doctoral degree	4
T8	Thai	Master's degree	8
T9	Filipino	Bachelor's degree and now studying in Master's degree	4
T10	Filipino	Bachelor's degree and now studying in Master's degree	13
T11	Thai	Master's degree and now studying in Doctoral degree	17
T12	Cambodian	Master's degree	7
T13	Filipino	Bachelor's degree	6
T14	Filipino	Bachelor's degree	2
T15	Filipino	Master's degree	7
T16	Thai	Doctoral degree	14

As shown in Table 3.2, teachers who participated in the study were predominantly Thai and Filipino. There was one teacher who was Cambodian. For educational background, most teachers received a Master's degree, and some foreign teachers completed a bachelor's degree. There was one teacher who obtained a doctoral degree. For teaching experience at the university level, half of the teachers have been teaching in universities for more than eight years, and the others have been in the

university context for less than eight years. The range of participants' ages was 30 - 45 years.

General perceptions of EFL university teachers towards technology integration and critical thinking skills in English classrooms were investigated. For employing technology in English classrooms, most teachers identified that using technology was considered a teaching aid. Certain teachers realized that technology integration focused on genres of technology such as hardware, software, and web resources. Few teachers concentrated on employing technologies for language learning activities such as exploring information. For critical thinking skills in English classrooms, teachers thought of different characteristics of critical thinking skills embedded in learning activities such as analyzing information, giving reasons to support ideas, and evaluating information.

The other group of participants was Thai EFL university students who are studying in one of Rajabhat universities in the west of Thailand. Regarding students' English language proficiency, a large number of students possessed English language proficiency in A1 and A2 while a less number of them gained B1 at the benchmark of The Common European Framework of Reference for Languages: CEFR. To engage in the present study, the students met the following inclusion criteria, including 1) to be a student at one of Rajabhat universities in the west of Thailand, 2) to have taken at least 1 English course in the GenEd course in the semester 2 academic year 2022, 3) to have an experience of learning English language with technology integration to promote critical thinking skills, and 4) to be willing to participate in the present study. Nevertheless, the students would not be included in the present study whether they did not satisfy the defined inclusion criteria, or they did not engage in the activities during the phase of collection data, or they would like to withdraw from the present study. The background information of students and their comprehension towards technology integration and critical thinking skills was discussed below.

Table 3.3 A personal background information of Thai EFL university students

Number of participants	Nationalities	Educational background	Learning experiences at university level (years)
S1	Thai	English major	2
S2	Thai	English major	2
S3	Thai	Computer education major	2
S4	Thai	Computer education major	2
S5	Thai	Computer education major	2
S6	Thai	Computer education major	2
S7	Thai	Biology major	2
S8	Thai	Biology major	2
S9	Thai	Social studies major	2
S10	Thai	Social studies major	2
S11	Thai	Art education major	2
S12	Thai	Art education major	2
S13	Thai	Music education major	2
S14	Thai	Music education major	2
S15	Thai	Math major	3
S16	Thai	Math major	3

As shown in Table 3.3, Thai students were studying in different majors, including English, Computer Education, Biology, Social studies, Art Education, Music Education, and Math. The number of English language learning experiences at the

university level was two years. Two students received three years of language learning experiences in this context. The range of students' ages was 20 - 21 years.

Broad perceptions of Thai EFL university students towards technology integration and critical thinking skills in English classrooms were explored. Technology was significant for their lives in terms of convenience for real life activities, exploration for information, and providing different forms of entertainment. The importance of technology in English learning consisted of increasing comprehension of English, promoting English practices, and exploring more information. To investigate the significance of critical thinking skills, students indicated that critical thinking skills helped them to give reasons to support ideas or decisions and to evaluate ideas for their real life activities. Moreover, it was useful for students to evaluate whether language usages were appropriate and to give reasons to support their ideas when participating in English learning activities.

3.4 Research instruments

To gather regularly the data in qualitative research, there are four core methods, including participating in the setting, observing directly, interviewing in depth, and analyzing documents and material culture. Furthermore, the number of qualitative studies employs a combination of data collection methods (Marshall & Rossman, 2016, p. 276). Specifically, the methods of gathering the data in phenomenological research consist of in-depth and multiple interviews, observations, documents – journals, poetry, and audio and visual materials – music, the other forms of art (Creswell, 2013, p. 81, Creswell, 2014, p. 190). Implementing these data collection methods allows phenomenological researchers to gather richer and deeper information about what the individuals have experienced the phenomenon and how they have experienced them, as well as to disclose the nature or essence of the lived experiences of the phenomenon.

For the present study, two research instruments were implemented to gather the data on the phenomenon under the study, including an in-depth interview and a class observation. The researcher implemented these research instruments because they allowed the researcher to explore what EFL university teachers and Thai EFL university students have experienced in the phenomenon of promoting critical thinking skills

through technology integration and how they have experienced it. Furthermore, it allowed the researcher to investigate other issues, including problems and solutions of technology integration in ELT that the teachers and students have encountered, and the effectiveness of instructional practices with technology integration and its influential factors. Therefore, the data obtained from the in-depth interview and the class observation best helped the researcher to analyze the participants' lived experiences of the phenomenon in order to reveal and explain the essence of utilizing technologies to promote critical thinking skills in ELT.

The descriptions of developing the research instruments were as follows:

3.4.1 Interview

An in-depth interview involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea or situation and to obtain detailed information about their thoughts and behaviors. In addition, it permits the researchers to explore new issues in depth (Boyce & Neale, 2006, p. 3). To specify a type of in-depth interview, a phenomenological interview is typically implemented to understand those experiences for developing a worldview, and to describe the meaning of the phenomenon that a small number of individuals have shared (Creswell, 2013, p. 161; Marshall & Rossman, 2016, p. 293). Similarly, interviewing in phenomenological human science studies is used to explore and collect experiential narrative material that serves as a resource for developing a richer and deeper understanding of a human phenomenon (Van Manen, 1990, p. 66).

In addition, the in-depth interview in phenomenological research might be divided into three interviews. That is, the first two interviews focus on past and present experiences respectively while the third interview concentrates on combining those two narratives to describe the individuals' essential experience with the phenomenon (Seidman, 2006). Consistently, Interviews could consist of a one-time session or multiple sessions with the same participants, and the length of the interview could range from a few minutes to a few hours (Gay et al., 2012, p. 386). It could be seen that the in-depth interview is the most constructive instrument for phenomenological research to gather personal experiences of the phenomenon for developing a rich description to comprehend its nature or essence.

To consider how to conduct the interview questions, there are three general types of interviews, including the informal, conversational interview, the guided interview, and the standardized interview (Patton, 2002, pp. 341-347). That is, the informal, conversation interview occurs as a casual conversation with individuals or small groups that are asked with spontaneous questions. On the other hand, the topical or guided interview is more structured and scheduled. Therefore, the interviewers prepare a list of topics or questions which may or may not have been shared with the interviewees beforehand. Finally, a semi-structured and standardized interview involves scripting and asking specific questions in a specific sequence. Moreover, Gay et al. (2012, pp. 386-387) suggested types of interviews which are identical to Patton (2002), including an unstructured interview, a structured interview, and a semi-structured interview. An unstructured or informal interview is considered a casual conversation to understand something in the research setting. In contrast, the structured or formal interview involves preparing a specific set of questions that elicits the same information from the informants. The last type of interview is a semi-structured interview which is a combination of unstructured and structured approaches.

For the present study, phenomenological semi-structured interview with open-ended questions was employed to explore EFL university teachers and Thai EFL university students' lived experiences of the phenomenon of promoting critical thinking skills through technology integration in ELT. The interview was separated into three sub-interviews, and open-ended interview questions were designed to serve the objectives of each sub-interview and research questions for both groups of participants. The length of the three-session interview was approximately 60 – 90 minutes, and it could be more or less than the mentioned period of time because it depended on the adequate responses from the participants. The one-on-one interviewing through the online meeting program was implemented for the present study because the participants were not hesitant to express or share their ideas and experiences of the phenomenon, and they were not anxious during the interview when they were in their private places. The Thai language was used for Thai EFL university teachers and students because Thai participants could fluently express their experiences and attitudes in their mother tongue for various interview questions. For foreign EFL university teachers who were of different nationalities, such as Filipino and Cambodian, the English language was

employed for the interviews because the researcher and these participants possessed different mother tongues, and English was the only language to communicate and share their experiences and perceptions about using technologies to promote critical thinking skills in ELT during the interviews. For the researcher, it was convenient to record the interviews and transcribe them. The multiple semi-structured interviews for both groups of participants were discussed as follows:

3.4.1.1 Interview for teachers (Appendix A)

The researcher developed a specification of interview questions which consisted of three sub-interviews, and a set of questions for each sub-interview was designed to serve the research questions and to reveal the essence of the phenomenon.

Interview one: this interview aimed to investigate teachers' background information and general knowledge of technology integration and critical thinking skills in ELT. That is, some questions of this interview focused on teachers' personal information and past experiences of ELT. Therefore, the interviewees could narrate the information regarding age, education level, English language teaching experiences at the university level, context, and teaching profession. Furthermore, some questions were designed to elicit the participants' background knowledge about technology integration and critical thinking skills in ELT. The researcher would like to understand to what extent teachers have known these two primary issues for developing the background picture of their lived experiences of the phenomenon.

Interview two: this interview aimed to explore teachers' lived experiences of the phenomenon of promoting critical thinking skills with technology integrations in ELT. The interview questions were constructed to serve the research questions which focus on six primary issues. The first issue is the types of technology that teachers have utilized in their instruction. Thus, the questions were created to elicit teachers to explain the types of technology employed, the purposes for technology selection, and how to select those types of technology. For the second issue, the questions about instructional practices using technology were asked to understand how teachers have utilized technologies in learning activities to promote students' critical thinking skills and the reasons for using those technologies.

Apart from exploring what and how technologies were employed to promote critical thinking skills in ELT, the researcher constructed some questions for the third issue. They allowed teachers to reflect on their instructional practices with technology integration in terms of teaching effectiveness, how to evaluate it, and how to enhance it. The fourth issue involved the problems that teachers have encountered, their effects on instructional practices, and the causes of those problems while the fifth issue was about solutions for those problems and appropriate support that teachers would like. The last issue related to influential factors towards employing technologies to promote critical thinking skills in ELT in terms of what influential factors are, how they affect instructional practices, and how to eliminate those factors.

Interview three: this interview aimed to explore the meaning of teachers' lived experiences of the phenomenon of promoting critical thinking skills with technology integrations in ELT. That is, the interviewees had narrated the past and present experiences of the phenomenon in two previous sub-interviews, and they attempted to provide a conclusion about the phenomenon in their lives. Thus, the questions were constructed to elicit teachers' meaning of this phenomenon, including the benefits of the phenomenon towards teachers' lives and teachers' expectations of the phenomenon.

3.4.1.2 Interview for students (Appendix B)

Similar to the interview for teachers, a specification of this interview included three sub-interviews with a set of questions. Questions in each set of sub-interview were framed based on the researcher questions. The data gathered from the students was employed to address and triangulate the data collected from the teachers.

Interview one: the interview aimed to investigate students' personal background and their experiences of English language learning at a university level. That is, the questions were designed to obtain historical information of the students regarding age, education level, studying major and department, life in university. Furthermore, some questions were created to gain an insight on their experiences of English language learning in a university. The data of this sub-interview assisted the researcher to perceive the general understanding of the phenomenon.

Interview two: the interview aimed to explore students' perspectives on teachers' instruction in promoting critical thinking skills with technology integration in ELT. In addition, six dominant issues relating to the research questions were developed for the interview questions. The first issue was the ordinary types of technology utilized in the English language class. Therefore, the students explained what technologies their teachers have integrated into the class to permit them to think critically and what other technologies are constructive for them. The second issue focused on teachers' instructional practices with the use of technologies. The questions of this issue allowed the students to narrate how their teachers have employed technologies in different language learning activities to support the students to think critically, and which activities technologies relatively support them.

The third issue permitted the student to consider the effectiveness of teachers' instruction with technology integration to promote critical thinking skills. Therefore, the questions were created to elicit students' perspectives on how effective teachers deliver their instruction with technology and in what way instruction with technology should be improved. Two following sets of questions were constructed to allow the students to explain problems and solutions when teachers have employed technologies in the classes. The last issue for this sub-interview involved influential factors that affect teachers' instructional practices with technology integration and how they have directly influenced the instruction.

Interview three: the interview aimed to explore the meaning of students' lived experiences of the phenomenon of promoting critical thinking skills with technologies in English language learning. The questions for this interview permitted the students to express the benefits that they have obtained from the phenomenon and the expectations that they further encounter in the phenomenon.

3.4.2 Observation (Appendix C)

In qualitative research, one of the fundamental methods for gathering data is observation. It refers to an act of nothing a phenomenon in the field setting through the five senses of the observer with an instrument and recording it for scientific purposes (Angrosino, 2007). Similarly, observation is an action that captures various activities, including hanging around the setting and using strict time sampling to record actions,

interactions, and a checklist to tick off pre-established actions (Marshall & Rossman, 2016, p. 278). Conducting the observation primarily depends on research purposes and questions, so the key focuses or interests of the research could be observed, such as physical setting, participants, activities, interactions, conversations, and the researcher's behaviors during the observation (Creswell, 2013, p. 166). In terms of phenomenological studies, an observation, known as a close observation is the indirect method to collect experiential material from others. The best way to enter a person's lifeworld is to participate in it. That is, the researchers try to enter the lifeworld of the persons whose experiences are relevant to the study material. Therefore, the method of close observation requires that one be a participant and an observer at the same time (Van Manen, 1990, p. 81; Van Manen, 2016, p. 318).

Another issue that the researchers take into account before conducting the observation is the researcher's role during the observation. There are two common types of observation, including participant and nonparticipant observation (Gay et al., 2012, p. 382). To take the role of a participant observer, the researcher participates in the situation while observing and gathering data on the activities, people, and physical aspects of the setting. The advantage of this type is that the researcher gains insights and develops relationships with participants, but it might be more difficult for the researcher to participate and collect the data at the same time. The other type of this method is nonparticipant observation. The researcher observes and records behaviors, but does not interact or participate in the life of the setting. This type of observation is appropriate for the researcher who does not have the background to act as a true participant, but it might require much effort to obtain reliable data about participants' perspectives. Furthermore, Creswell (2013, pp. 166-167) suggested further two more types of observation, including complete participant which the researcher fully engages with the individuals are observing, and complete observer which the researcher is neither seen or noticed by the individuals under the study.

To record what has been observed in the natural setting, field notes are best to document the observations because they describe all relevant aspects of the situation in the setting (Gay et al., 2012, p. 382). There are two basic pieces of information in the field notes, including descriptive notes and reflective notes (Gay et al., 2012, p. 382; Creswell, 2013, p. 169). The descriptive notes involve information about a description

of activities in the setting. The researcher attempts to summarize the chronological flow of activities in the class. Furthermore, the reflective notes allow the researcher to express personal reactions, thoughts, and reflections on the activities during the observation sessions. Field notes are relatively appropriate to record the data during the observations because they provide insightful descriptions and understanding of the participants, the research setting, and particular activities.

The objective of observation for the present study was to explore what EFL university teachers have experienced in the phenomenon of employing technologies to promote critical thinking skills in English classes and how the teachers have experienced it. Therefore, the specification of observational aspects was developed to assist the researcher to observe and effectively record the phenomenon of the present study as well as other relevant situations. The observational aspects consisted of instructional materials and resources, instructional process, challenges and adaptations. Both primary observational aspects, sub-aspects, and descriptions are included in the observation guide. Nonetheless, these observational aspects were constructed to serve certain research questions, and the data gathered with the observation was used to triangulate some aspects of the data collected from the interviews. The role of the researcher was a nonparticipant observer. That is, the researcher watched all occurrences according to the observational aspects in the learning activities in English classes and kept recording with field note in the observation guide, but did not engage or interact in the activities during the observation. The number of observations for each EFL university teacher was about 1 – 2 sessions because it depended on the completion of the instructional cycle for a lesson.

3.5 Data collection

To gather rich and deep experiential data to understand the phenomenon of promoting critical thinking skills through utilizing technologies in ELT, the researcher employed the process of qualitative data collection proposed by Creswell (2013, pp. 146-147) and phenomenological data collection suggested by Moustakas (1994). Creswell's process of data collection activities was employed in the present study because he proposed that these phases of gathering data are common to all qualitative approaches. Two specific activities of phenomenological data collection were integrated into Creswell's process, including the Epoche – the process of setting aside

prejudgments, biases, and preconceived ideas, and bracketing the research topic – the process of focusing on the research topic. The significance of these activities was to identify personal experiences with the phenomenon and to partly set them aside so that the researcher can focus on the experiences of the participants in the study (Creswell, 2013, p. 78). Figure 3.1 demonstrated the entire process of phenomenological data collection for the present study.

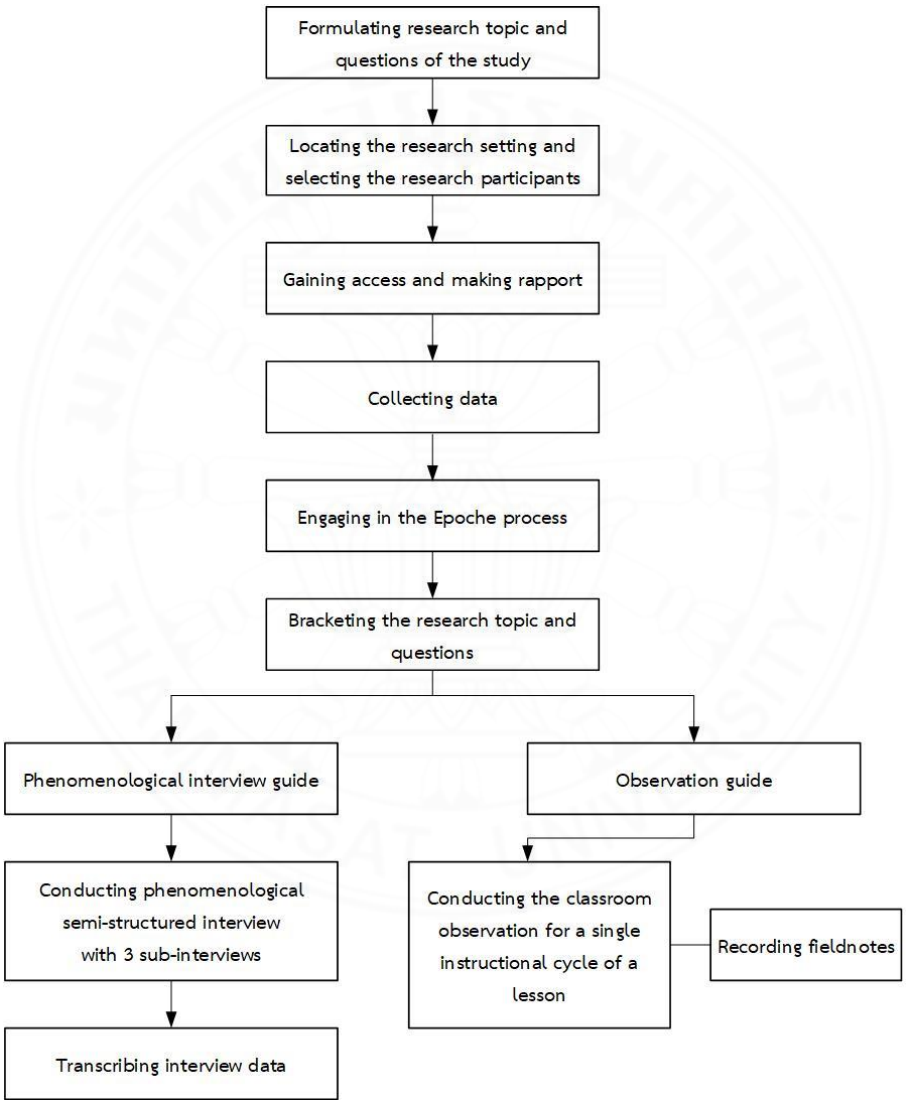

Figure 3.1 A process of phenomenological data collection

3.5.1 Procedures of data collection

After the activities of preparing data collection had been done, the researcher initiated gathering the data by seeking permission to enter the research setting. The permission letter (Appendix D) was officially submitted to the director of the Language

Institute to receive approval. The director arranged the institute board meeting for considering the approval, and the researcher attended the meeting to provide certain information such as the purposes of the study, the significance of the study, the research participants, the research instruments, and the procedures of data collection. After the permission for data collection was granted, the researcher constructed the participation letters to call for voluntary individuals to participate in the study. Once obtaining the number of participants who satisfied the inclusion criteria, the researcher administered the meeting for each participant to inform the purposes of the study, the procedure to be employed in the data collection, and the expected benefits to accrue to the participants. Moreover, the researcher notified the right of participants to withdraw at any time, the approach to protect the confidentiality of the respondents and the known risks associated with participation in the study. When the participants achieved an agreement of the research participation, they were required to participate in the data collection.

Gathering the data consisted of two primary processes, including interviewing and observing. The details for each process were discussed as follows:

3.5.1.1 Interview process

After selecting the participants who fitted the inclusion criteria, the researcher contacted the participants to explain certain information about the study through an online meeting program such as the purposes of the study, the significance of the study, and the procedures of data collection. Moreover, the researcher encouraged the participants to question whether they were doubtful about any issue of the study. If the participants completely understood all details of the study, especially the procedures of data collection and they were willing to engage in the study, the researcher asked them to sign a consent form and mailed it to the researcher before initiating the interview. Once received the consent form from the participants, the researcher contacted the participants to make an appointment to interview in terms of their available date and time. A day before the selected date, the researcher contacted the participants to remind the arrangement for the interview because the researcher would like to build support and trust with the participants. Before beginning the interview process, the researcher would engage in the Epoche process (Moustakas, 1994). The

researcher would eliminate biases, prejudgments, and preconceived ideas about the phenomenon to create a good atmosphere, build a good rapport with the participants and obtain new knowledge and experiences of the phenomenon.

For the interview process, the researcher conducted the face-to-face semi-structured interview by using the online meeting program because the participants were in their private residences to deliver their responses without any anxiety and pressure. Moreover, the researcher informed the participants that the interview was divided into three sub-interviews with different purposes. The different sets of interview guides would be employed depending on the participant's roles. The entire interview sessions for each participant would take approximately 60 – 90 minutes and they would be recorded in video files for transcribing the data. For the process of conducting the interview transcriptions, the researcher would immediately transcribe the data after the interview process had been done. The researcher would increase the validation of the interview data by having the participants verify the transcriptions, including themes and their significant statements. The participants were asked to review the transcriptions and freely provided feedback on their responses. Moreover, they could address additional responses that came into their mind when reviewing the transcriptions.

3.5.1.2 Observational process

The objective of observation was to explore certain aspects of participants' lived experiences of promoting critical thinking skills with technology integration in English language classrooms. The observation aspects consisted of 1) instructional materials and resources, 2) instructional process that included instructional methods, learning activities, teacher's roles, student's roles, and interaction, 3) challenges, and 4) adaption. The observation data could assist the researcher in fully comprehending the phenomenon and answering certain research questions: What types of technology do teachers integrate into their instruction to promote students' critical thinking skills? How do teachers integrate technologies into their instruction to promote students' critical thinking skills? What problems do teachers encounter when integrating technologies into their instruction to promote students' critical thinking

skills? How do teachers solve the problems that they encounter when integrating technologies to promote students' critical thinking skills?

Before initiating the class observation, the researcher contacted 8 out of 16 EFL university teachers who were willing to engage in the observation process and made an appointment to observe. Furthermore, the researcher informed the participants the objective of the observation and the process of observation. However, the researcher did not explain the observational aspects to the participants because the researcher would not like to build an anxious and pressured atmosphere. Once the permission was granted and the researcher obtained the consent form for observation, the observation process occurred. On the observation day, the researcher visited the classroom according to the available teaching timetable for each participant and introduced myself as well as the objective of the classroom observation to the class. The researcher's role is a nonparticipant observer so that the researcher would not interrupt the classroom activities and closely observed the participants' behaviors and interactions.

During the observation, the researcher took field notes as much as possible to record all activities, behaviors, and interactions based on the observation guide to focus solely on the topic. The number of observation sessions depended on an instructional cycle for a lesson, so it could be 1 – 2 observation sessions for each participant. That is, the researcher would like to observe the entire process of teaching and learning to obtain a complete understanding of instruction with technology integration to promote critical thinking skills. After the process of observation had been done, the researcher immediately transcribed the data observed from the classrooms and employed it to support the information gathered from the interview.

3.6 Data analysis

To analyze the qualitative data, the researchers frequently associate the analytical procedures with approaches (Creswell, 2013, p. 179). Several analytical approaches to qualitative analysis include content analysis, cross-case thematic analysis, and inductive analysis. Furthermore, qualitative analysis could consist of several approaches to make sense of the data (Patton, 2015, pp. 804-805). One of the relatively significant approaches in qualitative analysis is thematic analysis. This approach involves:

> Thematic analysis is a process for encoding qualitative information. The encoding requires an explicit code. This may be a list of themes, or a complex model with themes, indicators, and qualifications that are causally related, or something in between these two forms. The themes may be initially generated inductively from the raw information or generated deductively from theory and prior research (Boyatzis, 1998, p. 4).

It could be seen that analyzing the qualitative data employing thematic analysis requires the researchers to encode the data by using a list of themes that might be constructed inductively from the data or derived deductively from the literature.

Another significant approach to analyzing qualitative data is content analysis. Content analysis involves a qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meaning. Therefore, the core meanings exposed through content analysis are patterns and themes. The term pattern refers to a descriptive finding while the term theme takes a more categorical or topical form, interpreting the meaning of the pattern (Patton, 2015, pp. 790-791). It has been shown that the researchers who analyze the qualitative data with content analysis encompass a process of making sense of the data, identifying recurrences of words or phrases, and constructing emergent themes that reflect the perspectives of the participants. As those analytical approaches are discussed, it could be seen that thematic analysis involves a process of encoding the data with a set of themes while content analysis encompasses discovering and making sense of the data and generating patterns and themes derived from the data.

Apart from general approaches in qualitative data analysis, another issue of data analysis that should take into account is the analytical steps embedded in a specific qualitative design. Phenomenological research is discovery-oriented, so it would like to explore what a phenomenon means and how it is experienced (Van Manen, 1990, p. 29). Therefore, phenomenological data analysis involves making something of a text or a lived experience by interpreting its meaning. That is, it is a process of the insightful invention (my interpretive product), discovery (the interpretive product of my dialogue with the text of life), and disclosure (the interpretive product given to me by the text of life itself). Grasping and formulating an understanding is not a rule-bound process but

a free act of seeing meaning that is driven by the epoche, and the reduction (Van Manen, 1990, pp. 78-79).

For the present study, the researcher implemented content analysis as a process to analyze the data derived from the interviews and the observation. Furthermore, the process of phenomenological data analysis, including the epoche and the reduction, was emphasized to set aside the researcher's background and experience of the phenomenon and to concentrate solely on the participants' experiences of the phenomenon. The process of data analysis in the present study was developed based on data analysis in qualitative research proposed by Creswell (2014) and the process of the phenomenological model suggested by Moustakas (1994). An overview process of phenomenological data analysis for the present study was demonstrated in Figure 3.2.

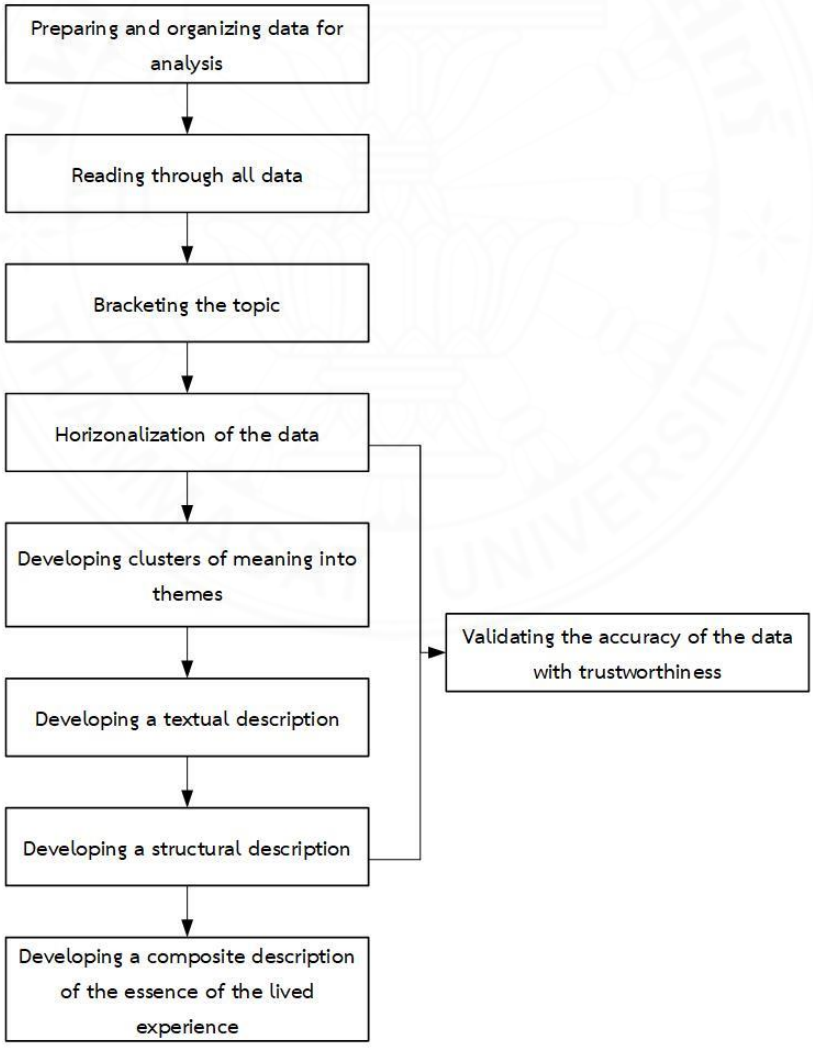

Figure 3.2 A process of phenomenological data analysis

3.6.1 Procedures of phenomenological data analysis

The analytical steps of phenomenological data analysis in the present study were constructed on the basis of Creswell (2014)'s and Moustakas (1994)'s procedures of data analysis. They were designed to disclose and explicate what EFL university teachers had experienced in the phenomenon of promoting critical thinking skills with technology integration in ELT and how they had experienced it. The researcher employed the processes suggested by these two well-known scholars because Creswell (2014) provided generic concise procedures to analyze the qualitative text data. On the other hand, the analytical process of Moustakas (1994) presented specific and systematic procedures in data analysis for phenomenological research. The analytical procedures were compounded as follows:

(1) Preparing and organizing data for analysis

The initial step of analyzing the data was the preparation and organization of the data. There were two primary sources of data, including the interviews and the observations. The researcher transcribed interviews and typed up field notes into computer files. When preparing the raw data, the researcher organized the data into appropriate text units, such as a sentence or the entire passage depending on the sources of the data for analysis.

(2) Reading through all data

This step required the researcher to obtaining a sense of the whole data. That is, the researcher read the transcripts and observational field notes in several times and attempted to make sense of them as a whole before separating them into parts. Meanwhile, the researcher wrote notes or memos in the margins of transcripts and field notes to reflect on its overall meaning and to record general thoughts about the data.

(3) Bracketing the topic

The procedure involved the epoche process and bracketing of the topic. For participating in the epoche, the researcher set aside prejudgments and biases of the phenomenon to perceive participants' original vantage thoughts and experiences of utilizing technologies to promote critical thinking skills in ELT. Therefore, the researcher declared personal background knowledge and experiences of the phenomenon. Moreover, The researcher had to position the research topic in a bracket

to focus solely on it and place irrelevant statements aside. Therefore, the data that was analyzed was directly associated with the research topic.

(4) Horizonalization of the data

The researcher developed a list of significant statements which provided an insightful comprehension of how the participants experienced the phenomenon. That is, when setting aside the researcher's personal experiences of the phenomenon and positioning the focus on the research topic, the researcher moved through the organized text data in the interview transcripts and the observational field notes. The researcher continued discovering statements about how the participants had experienced the topic, positioning each statement as having equal worth, and constructing a list of non-repetitive and non-overlapping statements.

(5) Developing clusters of meaning into themes

This analytical step involved the development of themes of the phenomenon. That is, the researcher took the significant statements called horizons or meanings that stood out as invariant qualities of the experience into account and clustered them into larger units of data called themes or units of meaning. The researcher implemented this step for multiple sources of data. Furthermore, horizons and themes derived from interview transcripts and observational field notes were employed to validate and affirm the credibility of the data. Furthermore, the researcher as the key coder reviewed themes and their subthemes again to assess whether subthemes and their theme were fully consistent. However, certain responses derived from the interviews could be clustered into different subthemes. For instance, the researcher first categorized an interview response into a subtheme of recognizing the mistakes. After the researcher reviewed subthemes and themes again, that response was clustered into a subtheme of sharing opinions because the main purpose of the response provided a chance to discuss the mistake.

(6) Developing a textual description

The significant statements and themes were used to write up a description of what the participants experienced the phenomenon called a textual description. That is, the researcher initially produced individual textual description for each participant by highlighting meanings of what the participants experienced and grouping them into themes. Then the researcher integrated all of the individual textual descriptions into a

composite textual description that was expressed in the descriptive format. This description assisted the researcher to disclose what the participants experienced the phenomenon and provided verbatim examples to support participants' experiences.

(7) Developing a structural description

When the composite textual description of the experience had been constructed, the researcher developed another description called a structure description that demonstrated how the participants experienced the phenomenon. That is, the researcher bracketed the significant statements that influenced how the participants experienced the phenomenon and what challenges, solutions, and factors involved the phenomenon. Then the researcher developed a list of invariant structural meanings and clustered them into themes. These structural meanings and themes were employed to construct an individual structural description and the researcher integrated all of the individual structural descriptions into a composite structural description. This description was constructive for the researcher to understand how the participants experienced the phenomenon. Furthermore, the researcher reflected on the personal experience, the setting, and the context in which the phenomenon was experienced.

(8) Developing a composite description of the essence of the lived experience

In the final step, the researcher constructed a synthesis of composite textual and composite structural descriptions. That is, the researcher employed meanings and themes derived from a composite textual description and those obtained from a composite structural description to incorporate and synthesize them into the meaning and essence of the phenomenon under the present study. This description facilitated the researcher to reveal the nature of promoting critical thinking skills through utilizing technologies in ELT.

3.7 Background of the researcher

The phenomenon of the present study was integrating technologies to promote students' critical thinking skills in ELT. To provide strong evidence of the phenomenon, I realized that my experience was relevant to the context and the problem of the present study. I attempted to clarify my personal information regarding the phenomenon to set aside my experience toward the phenomenon and solely concentrated on the participants' lived experiences of the phenomenon. I have been an

English instructor at Language Institute at Nakhon Pathom Rajabhat University for eight years and I believed that if students would like to master the English language, they had to practice using English as much as possible both inside and outside the classrooms. In the initial years of instruction, certain technologies I implemented in my language learning activities consisted of a laptop, projector and screen, a microphone, speakers, and Microsoft Office software such as Word and PowerPoint. I believed that these technologies could facilitate me to comfortably deliver the lessons in the classrooms and motivate students to actively participate in the language learning activities. A few years later, I utilized further software, namely LMS (learning management system) and Google Sites to provide more informative language learning resources and to collect students' class assignments. I thought that these applications were relatively constructive because they could allow the students to submit their digital assignments and online store them.

Currently, several innovative technologies were developed, and I increasingly employed them to facilitate my instruction and motivate students to participate in learning activities. Those technologies included hardware - a mobile phone and a tablet, and online software or applications with various functions - collecting opinions such as Mentimeter and Slido, creating texts or messages such as Google Jamboard, providing additional learning materials and collecting assignments – Google Classroom, and assessing comprehensions such as Kahoot, Quizzes, Blooket, and Wordwall. I thought that students paid more attention and actively participate in my language learning activities when those mentioned technologies were integrated. Therefore, I believed that students' motivation, participation, and English language abilities could be significantly promoted through technology-implemented learning activities.

In terms of critical thinking skills, after delivering the lessons and allowing students to practice their English abilities relating to the lessons, I asked certain questions to assess their understanding; as a result, the students had to provide explanations for those questions. Furthermore, I normally had the students share their responses during grammar activities and required them to assess whether those classmates' responses were grammatically appropriate. I discovered that only English proficiency students participated in these activities in the classrooms. In addition, I used to be the head of English courses in GenEd and I had a chance to design English courses

for the curriculum 2020. I discovered that the primary learning objectives of those courses emphasized enhancing English skills and further important 21st-century skills such as critical thinking skills were not addressed to provide students with opportunities to adequately practice these skills during English courses. The experiences of utilizing technologies and promoting critical thinking skills in ELT encouraged me to deeper explore this phenomenon in order to indicate what and how technologies were integrated to promote critical thinking skills in English language activities.

3.8 Trustworthiness

To assess the accuracy of the findings in qualitative research and to convince the readers of the accuracy, the procedures of qualitative validation should be discussed. Several scholars have proposed various approaches and their terms, for example, the conventional terms consist of internal validity, external validity, reliability, and objectivity while the naturalist suggests new words which are equivalent to those of the conventional terms, including credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985, pp. 300-301). The present study implemented Lincoln & Guba (1985)'s concept of qualitative validation because they suggest that these alternative terms make clear the inappropriateness of the conventional terms when applied to naturalism and provide alternatives that stand in a more logical and derivative relation to the naturalistic principles. The criteria of trustworthiness were discussed as follows:

The initial criterion of trustworthiness to enhance qualitative validation involves *credibility*. It refers to the researcher's ability to deal with the patterns in the entirety but to take certain actions that take account of the complexities (Guba, 1981, p. 84). One of the techniques to promote credibility is triangulation. Furthermore, one of the triangulation strategies is the triangulation of data sources that is employed to cross-check and support the consistency of the data (Patton, 2002, pp. 559-560). For the present study, the data derived from the interviews and the data obtained from the observations were analyzed and triangulated to establish and support the findings credible. Moreover, triangulating multiple perspectives from different groups, including EFL university teachers, and Thai EFL university students was implemented to increase consistently the data from different views of the participants.

Another criterion of trustworthiness to validate qualitative findings is *dependability* or called reliability in quantitative research. It refers to the stability of the data, but the researchers allow instabilities to arise (Guba, 1981, p. 86). One of the different strategies to promote dependability is establishing an audit trail. That is, an external auditor examines the processes of data collection, data analysis and interpretation. For the present study, the researcher asked three experts who were in the field of English language teaching and experienced in conducting qualitative research to examine the audit trail and to comment on the degree to which procedures used could be generally accepted. The aspects of the present study that the experts assessed consisted of the relationship between research questions and research instruments, the accuracy of data collection, and the level of data analysis and interpretation.

The researcher visited three experts on their site and provided an overview of the study in order to clarify to those experts the main purpose of the study and research methodology. After finishing the explanation, the experts started questioning in details for the interview for teachers and students. The experts presented the miner mistakes that they confronted such as misspelling in English and Thai questions. Furthermore, the experts indicated that some questions such as influential factors of technology integration would be intensively difficult for students to express their thoughts. Therefore, the experts suggested that if students could not provide their opinions towards those questions, the researcher should offer certain relevant situations for students, but the researcher should be careful that students were not navigated by those situations.

3.9 Ethical consideration

The present study involves some ethical issues. Before conducting the study, the researcher will submit the proposal for IRB approval and the letter of permission to the university administrators for visiting the research site and participants. Before starting the present study, the researcher will explain research problems and benefits to the participants and the purposes of the present study. The researcher will not pressure the participant to sign a consent form and tell them that they do not have to sign the form if refusing to engage in the present study. To collect the data, the purposes of research instruments and how the data will be used are discussed with the participants,

and the researcher will present compensation for participating at the end of the data collection process. For data analysis, the researcher will assign fictitious names for participants, and the data will be analyzed and reported with multiple perspectives and contrary results. All collected data relating to the participants will be confidentially kept in the locked cabinet and a researcher is a person who can access this data. After the present study has been done, this data will promptly be eliminated.

3.10 The Pilot Study

The phase of the pilot study aimed to determine research instruments, including an in-depth interview for teachers, an in-depth interview for students, and an observational guide. The pilot study was conducted in semester 1 academic year 2022. The participants in the pilot study consisted of three EFL university teachers and three Thai EFL university students who reached the inclusion criteria. For the interview process, the researcher and the participants, including teachers and students, made the appointments at their available dates and time. The interviews were administrated through online meeting software and were video-recorded. For the observational process, the researcher was allowed to visit a class from one teacher to assess whether the observation guide could be used to collect the aspects of teaching practices with technology integration, including types of technology, instruction with technology, and problems and solutions.

The result of the pilot study suggested that some questions were difficult for teachers and students to express their thoughts. Therefore, the researcher had to prepare a number of relevant situations for clarifying the nature of those questions. Furthermore, the researcher should not encourage the participants to answer quickly. Providing more time to think about the experience of technology integration in English language activities was required. For interview-related difficulties, some problems occurred during online interview sessions. Some participants had internet problems during the interviews, so the fluency of the interview was disrupted. Moreover, certain participants were not in a private place such as sitting in their offices during the interview. As a result, the participants lost concentration in the interview. For observation-related difficulties, it was challenging for the researcher when visiting the

classroom and observing the teacher's instruction with various observational aspects. The researcher had to realize what the target observational aspects were. According to the results derived from the pilot study, the researcher should take them into account when conducting the main study.

An overview of the data collection, the data analysis, and the data interpretation was shown in Table 3.4.

Table 3.4 A summary of the data collection, the data analysis, and the data interpretation

Main aspects	Questions	Participants	Research instruments	Data analysis	Data interpretation
1. EFL university Teachers' lived experiences in integrating technologies to promote students' critical thinking skills	1.1 What types of technology do teachers integrate into their instruction to promote students' critical thinking skills?	teachers	Interview/ observation	Content analysis	Types of technology that teachers integrate into their instruction to promote students' critical thinking skills
	1.2 How do teachers integrate technologies into their instruction to promote students' critical thinking skills?	teachers	Interview / observation	Content analysis	Practices of teachers' technology integration to promote students' critical thinking skills
	1.3 How effective do teachers perceive their technology integration to be in promoting	teachers	Interview / observation	Content analysis	Teachers' reflections on their technology integration to

Main aspects	Questions	Participants	Research instruments	Data analysis	Data interpretation
	students' critical thinking skills?				promote students' critical thinking skills
	1.4 What problems do teachers encounter when integrating technologies into their instruction to promote students' critical thinking skills?	teachers	Interview / observation	Content analysis	Problems of teachers' technology integration to promote students' critical thinking skills
	1.5 How do teachers solve the problems that they encounter when integrating technologies to promote students' critical thinking skills?	teachers	Interview / observation	Content analysis	Solutions for those problems of teachers' technology integration to promote students' critical thinking skills

Main aspects	Questions	Participants	Research instruments	Data analysis	Data interpretation
	1.6 What are the factors that influence teachers' technology integration to promote students' critical thinking skills?	teachers	Interview/ observation	Content analysis	Influential factors of teachers' technology integration to promote students' critical thinking skills
2. Thai EFL university Students' perceptions towards learning with technology integration to promote their critical thinking skills	2. What are students' perceptions towards learning with technology integration to promote their critical thinking skills?	Students	Interview/ observation	Content analysis	Students' perceptions towards learning with technology integration to promote their critical thinking skills

CHAPTER 4

RESULTS

The purpose of the study was to explore EFL university teachers' lived experiences in employing technologies to promote Thai EFL university students' critical thinking skills. To understand clearly this phenomenon, research questions were administrated to gather perceptions and voices from two groups of the participants, including 16 EFL university teachers and 16 Thai EFL university students. The research questions were divided into two primary aspects as follows:

Aspect 1: EFL university teachers' lived experiences in integrating technologies to promote Thai EFL university students' critical thinking skills

1.1 What types of technology do teachers integrate into their instruction to promote students' critical thinking skills?

1.2 How do teachers integrate technologies into their instruction to promote students' critical thinking skills?

1.3 How effective do teachers perceive their technology integration to be in promoting students' critical thinking skills?

1.4 What problems do teachers encounter when integrating technologies into their instruction to promote students' critical thinking skills?

1.5 How do teachers solve the problems that they encounter when integrating technologies to promote students' critical thinking skills?

1.6 What are the factors that influence teachers' technology integration to promote students' critical thinking skills?

Aspect 2: Thai EFL university students' perceptions towards learning with technology integration to promote their critical thinking skills

- What are students' perceptions towards learning with technology integration to promote their critical thinking skills?

The teachers and students were interviewed once, and 8 out of 16 teachers were observed for one instructional cycle. That is, the researcher visited teachers' classrooms twice because basically, teachers have taught one unit for two sessions for English courses in the GenEd course in this context. Creswell (2014)'s and Moustakas (1994)'s procedures of data analysis were employed for the study. The data derived

from the interviews was transcribed, and the field notes derived from the observation were organized. The researcher read the transcripts of the participants, and the field notes twice. The significant statements from the gathered data were listed and clustered into the meaning units or themes. Through these meaningful themes, what the teachers and students experienced in the use of technology to promote critical thinking skills in English classrooms were demonstrated as the textural description. For demonstrating the results, themes were presented along with quotes directly generated by the participants to each research question.

To demonstrate the qualitative results in a table of themes, subthemes, and percentage of opinions, participants' responses regarding each subtheme derived from the interviews were coded and the whole responses of subthemes which were clustered into a single meaningful theme were calculated into a percentage. Eventually, those subthemes were aligned from the highest percentage to the lowest one. It could be convenient to comprehend the results of different units of meaning underlying each research question. To present the results of research questions, the results relating to utilizing technologies in general were shown. Furthermore, the results regarding employing technologies to promote critical thinking skills in ELT were reported respectively. The voices gathered from the participants' lived experiences were quoted to support subthemes and themes associated with promoting critical thinking skills through technology-implemented English language learning activities. At least 3 voices obtained from the participants were provided for each subthemes, but certain subthemes which were mentioned by a very small number of the participants were supported with at least one meaningful quote.

Aspect 1: EFL university teachers' lived experiences in integrating technologies to promote Thai EFL university students' critical thinking skills

1.1 What types of technology do teachers integrate into their instruction to promote students' critical thinking skills?

This research question aimed to investigate technology that teachers commonly utilized in their instruction to promote students' critical thinking skills. Various types of technology were demonstrated through the interview and the class observation. Moreover, the teachers provided relevant information about employing

technologies to foster critical thinking skills in English classrooms. Different statements were clustered into three themes and subthemes, namely types of technology, reasons for technology integration, and criteria of technology selection. As shown in Table 4.1, it demonstrated the whole experience of implementing technologies for general purposes and for promoting critical thinking skills. However, the key focus of the study was the phenomenon of utilizing technology to promote critical thing skills. Hence, subthemes and their significant statements relating to critical thinking skills were narrated.

Table 4.1 A summary of themes and subthemes: technology integration in English language teaching

Themes	Subthemes	Percent of opinions
1. Types of technology	1.1 Hardware	50.0
	1.2 Software	50.0
2. Reasons for technology integration	2.1 Convenience to deliver an instruction	30.0
	- Hardware	
	- Software	
	2.2 Promoting students to share their thoughts or opinions**	15.0
	- Hardware	
	- Software	
	2.3 Consistency to learning activities	13.3
	- Hardware	
	- Software	
	2.4 Convenience for following learning activities	6.7
	- Hardware	
	2.5 Providing more interesting teaching aids	5.0
	- Hardware	
	- Software	
	2.6 Collecting information and assignments	5.0
	- Software	
	2.7 Available applications on devices	3.3
	- Software	
	2.8 Encouraging student's motivation	3.3
	- Hardware	
	- Software	

Themes	Subthemes	Percent of opinions
	2.9 Providing students additional materials - Software	3.3
	2.10 Available devices - Hardware	1.7
	2.11 Convenience to realize linguistic mistakes - Software	1.7
	2.12 Familiarity on using applications - Software	1.7
	2.13 Integrating devices as learning materials - Hardware	1.7
	2.14 Promoting language practices - Software	1.7
	2.15 Promoting students to create their assignments - Software	1.7
	2.16 Promoting students to explore more information** - Hardware	1.7
	2.17 Promoting students to provide reasons to support ideas** - Software	1.7
	2.18 Providing immediate student's results - Software	1.7
3. Criteria for technology selection	3.1 Convenience to deliver learning activities - Hardware - Software	33.3
	3.2 Consistency to deliver learning activities - Hardware - Software	16.7
	3.3 Available devices - Hardware	11.7
	3.4 Available applications on devices - Software	8.3
	3.5 No additional expense - Hardware - Software	6.7
	3.6 Promoting visual and audio learning activities - Hardware	5.0

Themes	Subthemes	Percent of opinions
	3.7 Encouraging student's motivation - Hardware - Software	3.3
	3.8 Appropriate for student's ability - Software	1.7
	3.9 Familiar to use devices - Hardware	1.7
	3.10 Having functions to serve teacher's purposes - Software	1.7
	3.11 Promoting students to share their thoughts or opinions** - Software	1.7
	3.12 Promoting students to provide reasons to support ideas** - Software	1.7
	3.13 Promoting students' participation - Software	1.7
	3.14 Providing students immediate results - Software	1.7
	3.15 Serving on student's devices - Software	1.7
	3.16 Collecting information and assignments - Software	1.7

Remarks: **The subthemes are relating to critical thinking skills.

1. Types of technology

The first theme for this research question indicated primary types of technology which were commonly utilized in EFL university teachers' instruction to encourage students to think critically. Teachers expressed their experiences with technology integration in their English classroom by providing a wide range of technologies and they were clustered into two subthemes, namely hardware and software. Those technologies could be employed for teachers' instructional practices with different purposes.

1.1 Hardware

The teachers were questioned to think of what technology they frequently utilized in English classrooms to encourage students to think critically. Certain technologies which teachers came up with were related to technology devices.

> Computer is a necessary device and also a speaker. Another thing which is important too is a projector with an onboard sound because I have courseware which I utilize for the class. (T1, interview, March 10, 2023)

> I always employ a notebook for instruction because I integrate teaching aids with writing functions such as underlining texts or writing on an online board. In addition, students use their mobile phones. They can use their tablets if they possess them. I think tables are relatively useful for learning. (T3, interview, March 15, 2023)

> Overview for hardware, I commonly utilize a mobile phone and a computer. Personally, I don't use a microphone but have a speaker. These three devices I utilize regularly. Furthermore, I categorize a mobile phone and a tablet as the same genre. It depends on the purpose of utilization. Some students use their mobile phones to participate in my activity. Meanwhile, other students use their tablets to do. However, I use a tablet sometime. That's all about my hardware. (T6, interview, March 10, 2023)

The responses from the interviews revealed that EFL university teachers mostly employed technology devices such as a computer or a notebook, a mobile phone, and a tablet for their instruction. Similarly, the result from the class observation revealed that EFL teachers frequently integrated their own laptops for their instruction. Moreover, they still used technology devices provided in the classroom such as speakers, microphones, and projectors and screens along with their laptops. However, these technology devices were considered as a medium which was cooperated with other technologies.

1.2 Software

Regarding software which EFL teachers employed in order to encourage students' critical thinking skills, they listed out a number of software that served their purposes of the instruction and was appropriate for their classroom activities.

> I utilize courseware and online games such as WordWall, QuizWhizzer, Blooket, Padlet, and Kahoot. (T5, interview, March 10, 2023)

> I use Microsoft PowerPoint because I have a presentation. Also, I use Microsoft Word. For online resources, I use a lot, for example, Google Classroom, Kahoot, Quizzes, Booklet, and Edpuzzle. Besides, I use YouTube because it's very helpful to provide videos to support my lessons. (T10, interview, April 19, 2023)

> Software I commonly integrate is Blooket for question-and-answer activity because it provides a function that students can attack their classmates. Moreover, I use Poll everywhere to allow students who are not confident to directly share their answers with the real class. Other software I use are Microsoft Word and Microsoft PowerPoint, but I prefer to use Microsoft Word than Microsoft PowerPoint because I can write down on it. The last main software is Padlet. (T4, interview, March 13, 2023)

As shown from teachers' experiences of integrating software into their instruction, teachers commonly utilized different types of software, for instance, courseware from commercial textbooks, word processing software, web resources, and so on. Consistently, the result from the observation indicated that teachers primarily employed courseware with their notebooks for almost learning activities. Certain types of software were used to support some learning activities. For example, most teachers integrated web resources – Kahoot, Quizzes, and Blooket to review the content and entertain students during the class.

2. Reasons for technology integration

In response to this research question, the second theme revealed the reasons why EFL university teachers utilized mentioned technology devices and software in

their English classroom to allow students to think critically. Table 4.3 demonstrated the whole subthemes which provided a description of reasons for employing technologies. The majority of the reasons elicited from the teachers in the interview sessions indicated that technologies were employed in ELT for general purposes of instruction such as convenience to deliver instruction, consistency to learning activities, and convenience for students to follow instruction. Interestingly, promoting critical thinking skills through technology-implemented language learning activities unintentionally occurred. That is, teachers were not aware that their technology integration in their instruction was promoting certain aspects of critical thinking skills. Reasons for using technologies in terms of fostering critical thinking skills consisted of promoting students to express their thoughts or opinions, promoting students to explore information, and promoting students to give reasons to support their ideas.

2.1 Promoting students to share their thoughts or opinions

EFL teachers frequently integrated both hardware and software into their instruction to promote students' critical thinking skills. Some teachers' experience indicated that hardware was utilized to present certain materials for discussion activities. Students perceived opportunities to share and exchange their opinions with their classmates. Furthermore, the experience of teachers from the interview suggested that most teachers integrated software to enhance students by thinking about the topic or questions and expressing their opinions through software. Interestingly, this practice might unintentionally happen because some teachers do not consider they are encouraging students to think critically.

> Laptop, projector, and speaker for showing videos, pictures. I have to use my laptop with projector. I use to facilitate discussion first and to discover background knowledge. I show picture and discuss about it. (T10, interview, April 19, 2023)

> I begin to use Padlet but I do not use as frequently as Moodle. When I have questions or I want students to share their opinions, I use Padlet. Even though students don't share their opinions in English, I perceive what they are thinking. (T11, interview, April 7, 2023)

> I use spreadsheets as a platform for my question-and-answer activity. For example, I would like to review vocabulary about an online meeting which students have learned during the first period of instruction. I ask students to share their answers through an online spreadsheet, not in a word cloud or online board because of the readiness of students' devices. For spreadsheets, students just download an application, so they can access it. Moreover, the spreadsheet is well-organized in terms of row, column, or table for answers. (T6, interview, March 10, 2023)

> I post open-ended questions in Slido. The students send the answers on the screen. They can see what they send and can see the answers from their classmates. There are questions that I send and students send answers on the screen. They are arguing that right or wrong. I am so happy because they are trying to prove it. That is not my intention. As a teacher, we are okay and it is right or wrong. Every opinion matter. This opinion is perfectly fine and that opinion is perfectly fine. It is up to you if you absorb. This may be a good example of unintentionally promoting critical thinking. (T13, interview, March 15, 2023)

As seen from the responses, hardware and software were frequently integrated into English classrooms. This instructional practice could be teachers' intentional or unintentional purpose for encouraging students' critical thinking skills. It could promote one of the critical thinking skills characteristics through their classroom activities. However, the result from the class observation indicated that most teachers frequently questioned their students with a range of questions relating to topics of learning activities, but the questions were orally asked out loud without utilizing technologies. Similarly, students provided their verbal responses to those questions.

2.2 Promoting students to explore information

This subtheme expressed teachers' experience in enhancing students to investigate more information. One EFL teacher commonly presented fascinating news or current issues to students because he would like to conduct a small conversation with them. He questioned students if they think it was fact or not and encouraged students to explore more information about it.

> Of course, I presented a viral topic for my students. Before I offered them a solution, I would like students to explore more information relating to the provided topic by using their mobile phones. Then the students decided if it was true or false. Sometimes, I asked students what current news they encountered on Facebook or other social media and raise it as the topic to create a conversation. (T8, interview, April 4, 2023)

2.3 Promoting students to provide reasons to support their ideas

For the last subtheme, one teacher expressed his experience in using a piece of information from web resources and required students to present their judgments on that information. Not just students evaluated if the information was true or not, but also they were required to provide certain thoughts to support their judgments.

> There were a lot of news topics on Facebook, and those topics could be local or world news topics. I concentrated on acquiring knowledge from them, not just focusing on learning English language. I questioned students after presenting topics if it was true or not. If not, did you express any reason to support your thought? (T8, interview, April 4, 2023)

According to the responses of EFL university teachers, it could be seen that most teachers possessed the reasons on technology integration for general instruction. There were a few teachers who spontaneously aimed to promote students' critical thinking skills through their use of technology. Furthermore, software such as word processing and web resources was frequently integrated than hardware to promote students' critical thinking skills in English language learning activities.

3. Criteria for technology selection

The last theme in response to the research question was how EFL university teachers selected technologies into their instruction. Primary teachers identified their general criteria to employ technologies for English classrooms such as convenience to deliver learning activities, consistency to learning activities, available devices, and available software on devices. Therefore, these criteria could not infer that technologies were used to encourage students to think critically. Nonetheless, only two responses regarding fostering critical thinking skills that teachers mentioned as their criteria for

selecting technologies were promoting students to share their thoughts or opinions, and promoting students to provide reasons to support their ideas. It could be interred that promoting critical thinking skills might not be profoundly perceived by teachers in their English instruction.

3.1 Promoting students to share their thoughts or opinions

When teachers were questioned about what criteria they applied for selecting technologies for their instruction, they mostly provided the criteria for using technologies in general learning activities. However, one teacher mentioned a criterion of utilizing software that encouraged students' critical thinking skills. She assigned students a class task and allowed them to share the task through web resources.

> Padlet was practical for students to share their assignments and they could assess if it was successfully submitted. Some software such as Google Form didn't allow students to examine if their assignments were successfully delivered. Moreover, students could encounter their assignments and classmates' assignments on software. This feature of software allowed students to think if their assignments or classmates' assignments were correct. As a result, they could review their assignments again. In terms of plagiarism, it was very convenient to realize that students copied their classmates' assignments because I could see them as the same pattern. Furthermore, this software presented a timeline of assignment submission, so I could know who submitted the assignments before. (T5, interview, March 10, 2023)

3.2 Promoting students to provide reasons to support their ideas

For the last subtheme, one teacher narrated her teaching experience with software that she would like her students to think about the answers and provide some reasons to support them. After she met her students several times, they recognized that they could perceive the answers for the activity if their teacher employed courseware. The teacher realized their students' behaviors. Therefore, the teacher integrated another software to encourage her students to provide reasons for their answers.

> Even though I used courseware for my lecture, I would turn some part of the information from courseware into a PDF file. Because students already knew

> that the answers would appear after my lecture with courseware. Therefore, when I employed a PDF file of teaching materials through Acrobat, I would ask students to show the answers. Students knew that I would not move to the next learning activity if they didn't answer. I would not ask students what the answer was, but I questioned why the answer for this item was, and what the keyword was. (T6, interview, March 10, 2023)

As seen from the responses, only a few characteristics of critical thinking skills were selected as criteria to integrate technologies in English classrooms, such as expressing thoughts or opinions towards learning activities and providing reasons to support ideas.

1.2 How do teachers integrate technologies into their instruction to promote students' critical thinking skills?

The purpose of this research question was to explore the teaching experience of teachers who integrated technologies to promote students' critical thinking skills. The teachers provided rich details of their teaching practices in English classrooms. They demonstrated the clear phenomenon of how technologies were utilized in the instruction. The significant details were developed into theme, namely English skills, and subthemes, including vocabulary, grammar, listening, speaking, reading, and writing. However, the primary focus of the study was using technology to promote critical thinking skills. Therefore, the general practices of technology integration were presented as an overview of teaching practices in English classrooms. The relevant information on employing technologies for critical thinking skills was discussed in detail.

Table 4.2 A summary of theme and subthemes: instructional practices

Theme	Subthemes	instructional practices	Percent of opinions
English skills	1. Vocabulary skills	1.1 Presenting content for learning activities - Software	7.4
		1.2 Assessing students' understanding before or after learning activities - Software	7.4

Theme	Subthemes	instructional practices	Percent of opinions
		1.3 Promoting students to practice language skills - Software	3.7
	2. Grammar skills	2.1 Promoting students to practice language skills - Software	7.4
		2.2 Promoting students to provide reasons** - Software	3.7
		2.3 Assessing students' understanding before or after learning activities - Software	3.7
		2.4 Presenting content for learning activities - Hardware - Software	3.7
		2.5 Promoting students to share their thoughts or opinions** - Hardware	1.9
		2.6 Promoting students to evaluate information** - Software	1.9
		2.7 Promoting students to evaluate information and provide reasons to support ideas** - Software	1.9
		2.8 Providing students additional materials - Software	1.9
	3. Listening skills	3.1 Presenting content for learning activities - Hardware - Software	7.4
		3.2 Promoting students to practice language skills - Software	3.7
		3.3 Promoting visual and audio learning activities - Software	1.9
	4. Speaking skills	4.1 Promoting students to practice language skills - Software	3.7
		4.2 Presenting content for learning activities - Software	3.7

Theme	Subthemes	instructional practices	Percent of opinions
		4.3 Promoting students to create their products and assignments - Hardware	1.9
		4.4 Promoting students to submit their products and assignments - Software	1.9
	5. Reading skills	5.1 Presenting content for learning activities - Hardware - Software	5.6
		5.2 Promoting students to evaluate information and provide reasons to support ideas** - Software	3.7
		5.3 Assessing students' understanding before or after learning activities - Software	3.7
		5.4 Promoting students to explore information** - Hardware	1.9
		5.5 Promoting students to practice language skills - Software	1.9
		5.6 Asking questions to lead in the lesson - Software	1.9
		5.7 Presenting and highlighting information - Software	1.9
		5.8 Promoting visual and audio learning activities - Hardware	1.9
	6. Writing skills	6.1 Promoting students to practice language skills - Software	1.9
		6.2 Promoting students to evaluate information** - Software	1.9
		6.3 Promoting students to share their thoughts or opinions ** - Software	1.9

Remarks: **The subthemes are relating to critical thinking skills.

English skills

The theme of this research question informed the past experiences of EFL university teachers who integrated into their teaching practices to promote students' critical thinking skills. Teachers expressed which English activities technologies were used and how they were employed in the activities. This narrative information of teaching practices was clustered into six skills, namely vocabulary, grammar, listening, speaking, reading, and writing skills. Teachers utilized a range of technologies in English language classrooms for general purposes such as presenting the content of the lessons and encouraging students to practice different language skills. However, certain aspects of critical thinking skills, namely sharing thoughts and opinions, providing reasons to support the opinions, and evaluating information were spontaneously promoted in various language skill activities, including grammar, reading, and writing skills.

1. Grammar skills

This subtheme provided a descriptive information of how technologies were utilized in English grammar activities to promote students' critical thinking skills. Teaching practices derived from the interview presented that teachers commonly used technologies for general purposes. For instance, teachers integrated software to encourage students to practice grammar. Furthermore, software was employed in teaching practices to present the lesson for the classes and to assess students' comprehension before or after grammar activities. In terms of fostering critical thinking skills, certain aspects, namely providing reasons for their ideas, sharing thoughts and opinions, evaluating information, and assessing information as well as giving reasons were developed through technology-implemented language learning activities. Some teachers suggested that an aspect of critical thinking skills that was mostly promoted in English grammar activities was providing certain reasons to support the responses.

> I integrated Kahoot or Quizzes to motivate students to think critically. After participating in those online educational resources, a necessary activity that I and my students did together was reviewing the options of questions. We brainstormed the ideas for each option and explained why this option was correct. For example, students did a present simple quiz. The question was

> Joey ____ to school and the optional consisted of walks, walk, walking. I questioned the students why this option was correct and some students provided a reason to support the correct answer. (T1, interview, March 10, 2023)

> My topic was prepositions. It was just like a review. It reviewed how to use 'in, on, at, and any' focusing on those kinds of prepositions. I used Edform because there were some worksheets there. It would test students' ability how to use propositions. After the test, the results were presented and students were asked to share their ideas about using prepositions. For example, why is the correct answer 'in'? Why not on at? It was not a debate, just a presentation of reason. Why did you answer 'in'? Why did you answer 'on'? (T15, interview, April 19, 2023)

In responses derived from the interview and observational information to this subtheme, teachers allowed students to think critically by sharing their opinions through technologies such as computers, projectors, and communication software. One teacher presented the topic of grammar activity, namely 'used to' to the class and allowed her students to share their ideas on using this kind of grammar and some examples through communication software. Furthermore, another teacher expressed that her students were asked to write down their answers after encountering the question.

> I employed a computer and projector to motivate students to focus on the learning activity. Then I demonstrated the question through the projector. Initially, I concentrated on students' participation to answer the question, not the correct answer. I wanted students to present their ideas. Then if the answer was incorrect, other students wrote down their answers on the whiteboard. When students encountered different answers, they cooperatively worked with their classmates to perceive the correct, and my role was motivating them to think about the answer. (T1, interview, March 10, 2023)

Furthermore, students' critical thinking skills were improved by asking students to evaluate certain information. During the grammar activity, one teacher required her students to assess whether the sentences constructed by their classmates

were correct through communication software. If there were wrong grammatical sentences, some of the students were required to present the appropriate sentences.

> I mainly integrated Line into my activity such as teaching grammar. I asked students to select one verb regardless of any tenses. Then they created a sentence with the selected verb and sent it into Line group chat. So students saw their sentences and their classmates' sentences. I asked students to cooperate by evaluating if sentences were correct. If not correct, I asked some students to correct them by replying the correct sentences to the original sentences. (T1, interview, March 10, 2023)

The response relating to this subtheme revealed that sometimes assessing information and providing reasons to support the ideas occurred at the same time during the grammar activities. This teaching practice was considered that the teacher was encouraging students to think critically.

> I integrated Kahoot for the grammar activity. I asked students to create a group of 4 group members and required the groups to answer questions through that online game. After all groups of students completed the game, they were asked to evaluate whether the answers were correct. Moreover, they had to provide reasons to support the correct answers to the class. (T2, interview, March 22, 2023)

As can be seen from the practices of teaching grammar, EFL university teachers delivered their instruction and integrated certain technologies to encourage students' critical thinking skills, including sharing thoughts or opinions, evaluating information, and providing reasons to support those thoughts or opinions.

2. Reading skills

When EFL university teachers were asked to describe their teaching practices for English classes, the English language skill which teachers frequently used technologies was English reading skill. Generally, technologies in English reading activities were employed for presenting the content for learning activities, assessing students' understanding before or after learning activities, or encouraging students to

practice English language skills. To promote students' critical thinking skills in this language skill, certain teachers suggested that those technologies were employed to encourage students to explore information, and evaluate information as well as provide reasons to support the ideas. Certain EFL university teachers enhanced their students' critical thinking skills during English reading activities by encouraging students to read the passage, evaluate the information from the passage, and provide reasons to clarify their judgements.

> I presented the reading passage, including three short stories. Then I had students read those stories and decide if they were facts. The first story was about a car fired by the building. The second story was about a King Kong bird. The last one was about a mysterious sign in the big field. Students looked at the pictures and their stories and evaluated if they were facts. Moreover, students had to give reasons to support their ideas. Those reasons could base on their experiences. (T8, interview, April 4, 2023)

> I thought when I used Slido, I posted open-ended questions. For example, I introduced the topic and posted questions 'What is the best modern technology?' and 'Why?'. Some students said cars. That was fine because it was their opinion. The student started arguing because in the book number 1 was the internet. So I asked them to use Slido without opening the book. I asked them again 'Which is number 1 for you from these ranges of technology?' and 'Why?'. Some students picked easily medicine. The topic was an invention. Students said my answer should be medicine because, during COVID, if there was no medicine, everybody would die. (T13, interview, March 15, 2023)

Moreover, only one teacher's response demonstrated that an aspect of critical thinking skills which was unconsciously developed in English reading skills with technology integration was exploring the information.

> First of all, I did a warm-up step before doing the next step for the reading activity. My warm-up did not focus deeply on language, but I motivated students to think. For example, I asked 'What news did you see currently?'. I

> frequently repeated this kind of warm-up step for my classes. So students knew that I would ask this question in all teaching sessions. Sometimes students' mobile phones were required to use for exploring information. For example, I presented the topic 'PM2.5' and asked 'How did it happen?' or 'What if you were a prime minister?'. So students searched for more information and sought out the answers. (T8, interview, April 4, 2023)

It can be seen from past experiences of teaching practices for English reading skills that few EFL university teachers allowed their students to think critically through using technologies. Some students employed their devices to explore more information that was relevant to the provided topics. Subsequently, certain students were required to assess the information from the reading passage and provide reasons to clarify their evaluation through online communication software.

3. Writing skills

The last subtheme in responding to this research question was relevant to English writing skills. Basically, technologies which EFL university teachers integrated into their teaching practices aimed to encourage students to practice their writing ability. However, certain aspects of critical thinking skills could be unintentionally promoted through technology-implemented English writing skill activities. Those aspects of critical thinking skills consisted of sharing thoughts and opinions, as well as evaluating information. One teacher assigned his students a writing task. The students brainstormed relevant information that could be included in that assignment and assessed if this information could be in this assignment.

> In the writing activity, I integrated VistaCreate software for the class because it was effective to create a modern portfolio or resume. Students could use their computer or mobile phone for this software. In the classroom, I divided students into groups and allowed them to discuss 'What information and details should be included in a resume?'. Sometimes I asked students ‘Should job descriptions take a part in the resume?’. (T3, interview, March 15, 2023)

For the responses derived from the interview, it showed that technologies integrated into English writing activities could encourage students to express their

thoughts or opinions. One teacher provided students with a writing task during the class and required students to check their writing content with a grammar checker software. Whether the software indicated grammatical errors, the teacher asked students to cooperate to correct them.

> For writing activities, students' mobile phones were used with Grammarly to assess the grammar of their writing assignments. This software informed students their grammatical errors and provided error descriptions. I asked some students to correct some errors, but they could not do it. I would require other students to share their ideas for correcting grammatical mistakes. (T3, interview, March 15, 2023)

From the responses relating to teaching practices for English writing skills, EFL university teachers attempted to integrate technologies, especially software, to encourage students to evaluate information and to provide their thoughts or opinions during the activities.

1.3 How effective do teachers perceive their technology integration to be in promoting students' critical thinking skills?

The purpose of this research question was to investigate EFL university teachers' views on the effectiveness of using technologies to promote critical thinking skills in English classrooms. The responses derived from the interview provided teachers' deep perceptions towards their teaching with technology integration. The significant meaningful units from the transcripts were grouped in themes, namely teachers' perceptions towards their effectiveness of technology integration, criteria to evaluate their effectiveness of technology integration and improvements of the current technology integration.

Table 4.3 A summary of themes and subthemes: effectiveness of technology integration

Themes	Subthemes	Percent of opinions
1. Teacher's perceptions towards their effectiveness of technology integration	1.1 High effectiveness	33.3
	1.2 Moderate effectiveness	60.0
	1.3 Low effectiveness	6.7

Themes	Subthemes	Percent of opinions
2. Teachers' criteria to evaluate their effectiveness of technology integration	2.1 Students' participation in learning activities	31.0
	2.2 Students' understanding of learning activities	20.7
	2.3 Students' motivation toward learning activities	13.8
	2.4 Students' quality assignments	10.3
	2.5 Students' feedback	6.9
	2.6 Teachers' and students' effective technology utilization	6.9
	2.7 Consistency to learning activities	3.4
	2.8 Promoting continuous learning activities	3.4
	2.9 Encouraging an interaction during learning activities	3.4
3. Improvements in current technology integration	3.1 Providing various functions to support learning activities - Software	41.2
	3.2 Developing teaching techniques of technology integration - Software	17.6
	3.3 Developing quality of technology devices - Hardware	5.9
	3.4 Developing some language mistakes - Software	5.9
	3.5 Promoting students to frequently use technology - Software	5.9
	3.6 Discovering new fascinating online educational games - Software	5.9
	3.7 Providing reasonable scores when participating through software - Software	5.9
	3.8 Presenting information when participating through software - Software	5.9
	3.9 Providing additional storage space for collecting more information - Software	5.9

1. Teacher's perceptions towards their effectiveness of technology integration

When EFL university teachers were asked to measure their effectiveness in utilizing technologies to encourage students to think critically, they provided different responses relating to their ability on using technologies. Some teachers identified that they were relatively effective in technology integration. However, the majority of teachers expressed that their effectiveness in using technologies was still moderate and one teacher considered her effectiveness in employing technologies as low.

1.1 High effectiveness

During the interviews, certain teachers confidently expresses that they could effectively utilized those technologies in English classrooms. They could use both hardware and software to appropriately provide instruction.

> I was very confident with my skills in using this stuff. I have been using it now. I got used to it, and I knew, as a teacher, something that worked. I changed a little bit. I could use it properly and effectively. (T10, interview, April 19, 2023)

> I considered my technology integration very effective. I could make a teacher and students get closer. In the past, I held a textbook and provided a lecture for students. So it could not motivate students. Currently, students spent more time with their devices. When I asked students to do something on their mobile phones such as participating in Padlet, they could do it so fast. (T1, interview, March 10, 2023)

> When I compared the traditional and modern ways, it's more effective. It's easy and time-saving because I didn't need to write. I just presented. Now I adapted technology in every aspect of life. How effective, I can say 'very effective' in promoting critical thinking skills. The student tried to analyze and evaluate. (T9, interview, March 21, 2023)

1.2 Moderate effectiveness

For this subtheme, a number of teachers informed that their abilities in using technologies to encourage students to think critically were effective because teachers

could implement certain software in their English learning activities and they could solve any technology problems during activities.

> I thought my technology integration was effective, but it might not be 100 percent effective because there was some software that I used for answering questions, such as Blooket. My students could process their thoughts, but I thought that might not be relatively critical. (T4, interview, March 13, 2023)

> Personally, I thought I could deal with any technology problems when they occurred. Technologies both hardware and software didn't serve all classroom activities. I had to combine technologies together. Therefore, I focused on using technologies for promoting critical thinking skills. I used technologies for classroom facilities, but I didn't allow students to analyze or synthesize in the activities much. (T7, interview, March 13, 2023)

1.3 Low effectiveness

When asked whether teachers was effective in employing technologies in English teaching practices, a few teacher indicated that her technology ability was not less appropriate for providing instruction with new technologies.

> I thought that my technology use was not effective because my colleagues informed me how to use technology. I had to consult her on how to use this technology. So I understood. For example, I had to set this in order to provide students with assignment deadlines. I was not similar to other colleagues who got used to technology, so they could do so fast. (T16, interview, April 25, 2023)

In response to EFL university teachers' perceptions towards their effectiveness of technology implementation, it revealed that teachers perceived their ability in using technology for English classrooms in a range of effectiveness levels, including high, moderate, and low effective.

2. Teachers' criteria to evaluate their effectiveness of technology integration

After EFL university teachers informed how effective their technology integration was in English language teaching, teachers were required to express how

they perceived whether their abilities to use technologies were effective. A variety of criteria were provided through teachers' views and those important statements were clustered into criteria. Three highest mentioned criteria for identifying the effectiveness of technology integration were the participation of students in learning activities, understanding of students towards learning activities, and motivation of students towards learning activities.

2.1 Students' participation in learning activities

The first subtheme was the highest criterion which a majority of teachers applied to measure their technology abilities in teaching practices. Teachers provided some learning activities for the classes and students actively engaged in those activities by using their devices.

> I thought my students were relatively active when I employed some technologies. Students engaged in playing games or answering questions. They collaborated to analyze why this answer was correct. Some students did exercises in the textbook and answered those exercises to the class. (T2, interview, March 22, 2023)

> I felt that students realized what I would question in warm-up activities for the second week. Students would communicate with me. So it showed that students were interested in these activities and might have some points to discuss with me. I would be questioned first when starting the class on the fourth week. Students used their mobile phones to search for information and answered. I thought my technology integration could promote students to discover information and confidently express their ideas. It clarified that my using technology was effective. (T8, interview, April 4, 2023)

2.2 Students' understanding of learning activities

To identify teachers' effectiveness of technology integration, teachers suggested that they commonly observed students' understanding of the lesson or learning activities. If students were able to successfully complete the provided tasks during learning activities, teachers considered that their teaching practices with technologies were effective.

> I thought a criterion to measure my effectiveness in technology utilization was students' understanding. So students were able to answer questions. Moreover, students could express their opinions because opinions or answers for critical thinking skills were not right or wrong. (T4, interview, March 13, 2023)

> I measured myself if what technologies I integrated into learning activities worked, students could understand what I taught. Apart from students' understanding, it could be teachers' understanding of technology integration. I discovered more information about new technologies because I had to understand how to use them. (T11, interview, April 7, 2023)

2.3 Students' motivation toward learning activities

The last criterion which teachers in this context implemented to evaluate their effectiveness was students' motivation. When teachers integrated different technologies into language learning activities, students provided considerable interest in the activities. As a result, students intensely participated in learning activities.

> For my students, I could be able to booth their interests. I motivated them to learn and I used a lot of stuff and integrated a lot of technologies to make them active. (T9, interview, April 21, 2023)

> Students who had high motivation would engage in learning activities during the class. Students enjoyed answering questions provided in the activities. Students' motivation could be constructed from different components. I thought those components might be technologies integrated into learning activities, teachers' characters, or learning activities. (T1, interview, March 10, 2023)

As seen from EFL university teachers' responses on how they were able to identify the effectiveness of technology integration, primary teachers applied those criteria relating to students' participation, comprehension, and motivation to indicate how effective they used technologies to promote critical thinking skills in English classrooms. In terms of fostering critical thinking skills, the responses derived from teachers indicated that no aspect of critical thinking skills was considered as a criterion

to measure teachers' effectiveness of implementing technologies in English teaching and learning. It could imply that EFL university teachers might not be consciously aware of developing aspects of critical thinking skills through technology-implemented English language classrooms.

3. Improvements in current technology integration

When EFL university teachers expressed their views on how effective their technology utilization in English instruction was and how their effectiveness was measured, teachers provided additional perceptions on what should be improved in terms of implementing technologies to promote students' critical thinking skills. The responses derived from teachers' experiences were categorized into different subthemes such as developing the quality of technology devices, encouraging students to frequently employ technologies, and so on. However, from the responses derived from teachers' views, a large number of teachers mentioned that additional platforms with various functions should be provided to teachers to promote their effective English instruction. Furthermore, teachers suggested that improving their teaching techniques with technology, especially in encouraging students to think critically was relatively required as shown in the second subtheme.

3.1 Providing various functions to support learning activities

For this subtheme, teachers suggested that different technologies, especially software, should provide a range of useful functions to promote effective learning activities. Those functions could facilitate both teachers and students.

> I thought Jamboard should provide a communication channel like ZOOM. For example, some students had questions, and they could send their questions into a chat box. So I thought Jamboard should serve the purpose of communication in a single platform. Moreover, I thought Jamboard should have a function that allows students to add multimedia like Microsoft PowerPiont. (T7, interview, March 13, 2023)

> Now I didn't want to commit any. In fact, I wanted to add more hardware and software which was up-to-date for learning. I thought all technologies I mentioned were relevant to my lesson and instruction in the classroom. But I

> wanted to focus more on Edform because Edform was hard to create your template. If I were in a career in terms of Edform, it required me to make my template, poster, and a set of questions. It took enough time and effort to complete because what I used now was the free template from the internet. (T15, interview, April 19, 2023)

3.2 Developing techniques of technology integration

The responses derived from teachers' perceptions demonstrated that teachers should be developed in terms of teaching techniques of technology integration to encourage students' critical thinking skills. Currently, some teachers mentioned that technologies were implemented for general purposes in English learning activities.

> I thought what should be improved was my teaching approach to using technology because I was not very good, so I had to improve. So I can integrate technology better to promote critical thinking skills. (T14, interview, April 19, 2023)

> I had to improve myself first in terms of technology. I wanted to have extra knowledge and skills in terms of integrating technology. I observed my students when I integrated technology, they were more responsive. It would give them much interest. (T15, interview, April 19, 2023)

> For me, using Slido and Google Classroom to gather responses from my students was effective. I thought what should be improved was how I used it in the class. The teaching technique was how to promote more critical thinking skills in the class, not only using technology to introduce the topic. I thought that was how I should improve more. (T13, interview, March 15, 2023)

The results of this theme indicated that certain technologies, especially software, should provide additional functions to generate effective use of technology for learning activities. Furthermore, teaching techniques for technology implementation, especially for promoting critical thinking skills, should be increased. As seen from the voices of the second subtheme, it could be interred that EFL university teachers had limited teaching techniques to employ a range of technologies to

encourage students to think critically in their English language classroom. Therefore, developing critical thinking skills through technology-implemented English language activities should be appropriately increased.

1.4 What problems do teachers encounter when integrating technologies into their instruction to promote students' critical thinking skills?

This research question aimed to explore the problems which EFL university teachers frequently experienced when technologies were integrated into English classrooms to encourage students to think critically. Teachers provided a range of problematic statements regarding technology utilization and those statements were grouped into themes, namely student-related problems, teacher-related problems, and technology-related problems.

Table 4.4 A summary of themes and subthemes: problems of technology integration

Themes	Subthemes	Percent of opinions
1. Student-related problem	1.1 A lack of knowledge on how to use software - Software	100.0
2. Teacher-related problems	2.1 A lack of well-preparing online teaching aids - Software	66.7
	2.2 A lack of knowledge on how to connect devices - Hardware	33.3
3. Technology-related problems	3.1 Unstable internet signal - Hardware	36.1
	3.2 Readiness of devices - Hardware	19.4
	3.3 A restriction of software functions - Software	16.7
	3.4 Unconnected devices - Hardware	11.1
	3.5 Sophisticated software - Software	8.3
	3.6 No compatibility between hardware and software - Software	5.6
	3.7 A limited number of materials - Software	2.8

1. Student-related problem

For this theme, the responses derived from the interviews revealed that teachers encountered a problem related to their students when promoting students' critical thinking skills with technology integration into English classrooms. Certain teachers indicated that a problem associated with the students was inadequate knowledge of how to utilize software which was integrated into English language learning activities. This problem relatively affected the fluency of their instruction when critical thinking skills were developed with technology-implemented language learning activities.

1.1 A lack of knowledge on how to use software

The first subtheme indicated the problem of technology integration which was associated with students. When teachers implemented new technology in their instruction, students seemed to be unable to participate in learning activities with technology because students confronted it for the first time and did not know how to employ that technology.

> For the initial period of using Padlet, students could not use it because they did not know how to use it. This problem occurred with all platforms that were used for the first time. For the first utilization, I had to demonstrate how to access it and what the next step was. I had to provide a demonstration of using software for students for the first time. (T1, interview, March 10, 2023)

> Every time I employed new software into the classes, such as Blooket, not all students could use it. In Blooket, there were nine types of competitions, such as racing, tower defense, and so on. It was difficult for some students even though I informed them how to use it step-by-step because students had different levels of digital literacy. For example, I asked students to join for tower defense in Blooket. I was so tired to check whether students joined the game and got ready to start. I spent much more time to suggest them how to play. (T6, interview, March 10, 2023)

2. Teacher-related problems

The second subtheme of the problems that emerged in the experience of teachers' technology integration to promote critical thinking skills was regarding teachers. The voices derived from the interviews suggested that teachers themselves encountered certain difficulties when enhancing critical thinking skills through their technology-implemented English instruction. Those difficulties consisted of an inappropriate preparation for online teaching aids and inadequate knowledge of how to connect technology devices. These problems associated with EFL university teachers did not profoundly affect English instruction in terms of promoting critical thinking skills.

2.1 A lack of well-preparing online teaching aids

When teachers employed different web resources in English learning activities, there were several tasks that teachers had to prepare before the classes were initiated, such as compiling relevant information to the lesson, discovering the appropriate web resources for learning activities, and so on. These tasks of teaching preparation were time-consuming activities.

> Sometimes I didn't have time to prepare for online activities. I didn't like the concept of unprepared activities. So I learned from the types of the lesson and today I would use an activity from Edform. I thought it required much preparation to use the software. (T15, interview, April 19, 2023)

> I used PowerPoint or Google slide for my classes. The issue was that I forgot to put something on the slide because different classes had different pages or lessons. Sometimes I got confused if I had done it. This part had to be ready there. For Slido connected to google classroom, I needed to make sure that I duplicated my slides because if I used the same Slido question or slide for the next classes, this Slido was already used. (T13, interview, March 15, 2023)

2.2 A lack of knowledge on how to connect devices

The last subtheme for teacher-related problems demonstrated that one teacher confronted a problem relating to connecting between teacher's devices and high-technology classroom devices such as interactive television.

> I encountered a problem connecting my laptop to a smart board. I did not know how to connect it. I had to learn how to deal with this problem at the beginning of the class. I thought that this problem was a waste of time for my instruction. (T1, interview, March 10, 2023)

However, the result derived from the observational data indicated that one teacher encountered the problem regarding connecting the HDMI cable with her laptop during the instruction. Initially, she could deliver her lessons well through the projector and screen. In the middle of her teaching session, she worked on the laptop and disconnected it from the projector by removing the HDMI cable from her laptop. The problem happened when the teacher reconnected the cable to continue the lesson for the class. It could not work for the first time when the teacher attempted to plug the cable into her laptop. Finally, she could cope with the problem by connecting the cable for the second time. It suggested that the problem regarding a lack of knowledge on how to connect devices might not only be caused by teachers. Instead, teachers had known how to employ their devices with the classroom facilities, but those facilities were not adequately maintained in an appropriate condition to use.

3. Technology-related problems

For the last subtheme, the perceptions derived from teachers showed that there were several problems regarding hardware and software integrated into English learning activities. Teachers expressed that they were required to deal with different obstacles of technologies used in learning activities such as unconnected devices, sophisticated software, and so on. Nonetheless, the problems that teachers encountered most during their technology-implemented language learning activities for fostering critical thinking skills were unstable internet signal, the readiness of devices, and a restriction of software functions. In discussing these three subthemes, teachers expressed that they mostly encountered these problems in English language learning when several technologies were used. Moreover, the internet single, suitable devices and software with appropriate functions were associated with each other and provided considerable negative effects on teachers' instruction.

3.1 Unstable internet signal

When online resources such as online games or quizzes were implemented in English learning activities, the majority of teachers encountered a problem with the internet signal. This problem relatively affected students' participation in learning activities.

> When I used Quizzes, some students could not join because they had weak internet signals. I could not stop the quiz while the other students were doing it. So not all students could participate in that quiz. (T14, interview, April 19, 2023)

> When using the software, there was a problem with the internet signal. So students could not engage in that software. For example, this problem occurred when integrating Kahoot into the learning activities. The internet was low, so students could not access Kahoot, or the game was delayed. (T2, interview, March 22, 2023)

> The first problem was the internet. Students could not access the internet, or the internet was low. For example, I employed Flipgrid software for teaching speaking skills. Because of the low internet signal, students could not record their conversations, and task submission was delayed. (T3, interview, March 15, 2023)

3.2 Readiness of devices

The second subtheme relating to the readiness of technology devices was mentioned by several teachers. Teachers who integrated web resources such as online competitions, online quizzes, and so on for their learning activities encountered the problem with readiness of students' devices.

> I experienced a problem with students' mobile phone batteries. I asked students to use their mobile phones to participate in learning activities. Then the phone batteries were flat while joining the activities. This problem caused students' participation delayed. (T2, interview, March 22, 2023)

> Basically, students had cell phones or laptops as basic tools for communication. The problem was that they could not access it because their cell phones were very slow and not updated. The software might require more memory to do the activity or to answer the questions. So they could not answer questions because they could not access the software. It might affect students' responses or participation. (T15, interview, April 19, 2023)

3.3 A restriction of software functions

For the last subtheme regarding technology-related problems, certain teachers expressed that some software provided a small range of functions to serve English learning activities, such as limiting a number of participants and providing few functions.

> For software, there might be a problem with a restriction of its software. For example, students could share information, submit tasks, or provide comments in Padlet. Students could not do other activities. (T5, interview, March 10, 2023)

> Sometimes, I used Kahoot for free, so there was a limited number of participants. I got 50 students, so sometimes I asked students to work in a group of 3 students. For me, I wanted them to do it individually. (T9, interview, April 21, 2023)

As seen from teachers' perceptions toward obstacles of technology integration to encourage students to think critically during learning activities, there were several primary problems derived from the interview data, including student-related, teacher-related, and technology-related obstacles.

1.5 How do teachers solve the problems that they encounter when integrating technologies to promote students' critical thinking skills?

This research question aimed to investigate how EFL university teachers overcame those problems when they implemented different technologies to promote students to think critically in learning activities. Teachers informed a variety of

problematic issues that they encountered in their classes and how those issues were solved. Furthermore, teachers suggested what should be supported when various technologies were employed to facilitate students to think critically. These responses derived from teachers were grouped into two themes, namely solutions for technology integration and supports for technology integration.

Table 4.5 A summary of themes and subthemes: achievement of technology integration

Themes	Subthemes	Percent of opinions
1. Solutions for technology integration	1.1 Student-related solution	
	- Providing a software instruction	7.3
	1.2 Teacher-related solutions	
	- Ensuring appropriateness and readiness of teaching aids	4.9
	- Providing technical support	2.4
	1.3 Technology-related solutions	
	- Using a personal or peer internet access	31.7
	- Preparing devices for learning activities	17.1
	- Discovering other software for learning activities	14.6
	- Providing additional connecting tools	9.8
	- Providing a software instruction	7.3
	- Implementing other software cooperated with the main software	4.9
2. Supports for technology integration	2.1 Teacher-related support	
	- Training and professional development	23.7
	2.2 Technology-related supports	
	- Classroom devices	28.9
	- Software license	26.3
	- Stable internet signal	13.2
	- Technical support	5.3
	- Useful resources for learning activities	2.6

1. Solutions for technology integration

After EFL university teachers informed different problems in their teaching practices when they employed different technologies to encourage students to think critically, they provided certain practical solutions connected with those problems. Those solutions were categorized into student-related, teacher-related, and technology-related solutions. The responses in relation to teachers' experiences of developing critical thinking skills with technology-implemented English language learning

activities could imply that teachers encountered unexpected problematic matters during their instruction. As a consequence, teachers themselves had to possess problem-solving skills to discover appropriate and practical solutions to deal with those matters.

1.1 Student-related solution

When teachers implemented a new type of technology into their learning activities to facilitate students to think critically, and the students had never experienced it before. Students could encourage the problem of using it. Therefore, teachers demonstrated its instruction to students to overcome a lack of knowledge on how to use the software.

> When students did not know how to use Blooket, there were two solutions to deal with this problem. Firstly, students might ask me for help, so I helped them to solve the problems that they encountered. Secondly, it might be peer assistance. Students might ask their classmates to solve the problems. (T6, interview, March 10, 2023)

1.2 Teacher-related solutions

Apart from the solutions relating to students, this subtheme presented the explanations that teachers applied for problems associated with teachers who employed several technologies to promote critical thinking skills in learning activities. Even though teachers well prepared the content and supplementary materials for their instruction, they could encounter some problematic issues when those materials were integrated with technology. Therefore, teachers determined whether their teaching aids or materials were appropriate and suitable for learning activities.

> I had to perceive knowledge before sharing Edform with students. It was dangerous that students asked for clarification, and I was confused about what the answer was or how to answer. Before sharing it with my students, I made sure that I mastered it. (T15, interview, April 19, 2023)

> The problem was I forgot to duplicate my Sliod. For this semester, I had three copies of my Slido for the same subject. I put the name for each Slido with the course title and section. And I put the mark when I ended the lesson. It was

> just for me where to begin in the next meeting. We ended with this, and I would put exercise here and start here. The proper note was very important for me. I made sure that I duplicated and put the correct file on the Google slide because Slido was integrated into the Google slide. (T13, interview, March 15, 2023)

Furthermore, some teachers confronted a problem when unfamiliar devices were available in their classrooms. Common devices in the classrooms were provided to serve teaching and learning activities, including a computer, a projector, and so on. In particular smart classrooms, the interactive smart boards were offered to promote effective instruction. However, certain teachers did not perceive how to connect their devices to this high-technology device. Therefore, technical support should be provided for teachers.

> When I encountered this problem, I attempted to solve it myself first. For example, I asked students to discover another available room, and then I moved to teach in that room. Or I contacted a technician to solve the problem for me. (T1, interview, March 10, 2023)

1.3 Technology-related solutions

For technology integration in English classrooms, technology could cause several problems to disrupt teachers' instruction to promote critical thinking skills. The highest frequent problem which teachers encountered during learning activities was the internet connection. Therefore, using personal or peer internet access was mentioned as the solution to this problem.

> When I connected with university Wi-Fi, there was any problem with Wi-Fi. I would use a LAN cable to access the internet instead. Unfortunately, if there were problems with the university Wi-Fi and LAN cable, I would change to my personal internet. (T7, interview, March 13, 2023)

> If students had a problem with a low internet signal during participating in Kahoot, I might share my internet from my mobile phone with them. Or that students might ask their classmates to share the internet with them. I might

> contact a university technician to deal with the internet problem. (T2, interview, March 22, 2023)

Moreover, digital devices possessed by students could lead to some problems in learning activities to encourage students to participate in learning activities. When teachers required students to employ their devices for engaging in some activities, some students could not access the selected software for those activities because of the compatibility of students' devices and software. Therefore, students were assigned to prepare their devices for learning activities in advance.

> Students might use their mobile phones for a long time before attending my classes, so their phones were out of batteries for learning activities. So I asked students to look for other devices to engage in the activities. (T2, interview, March 22, 2023)

> The problem could be the capacity of students' devices. Their devices' capacity might be low and not updated, so they could not access them. My solution was that before I entered the class, I always messaged students to make sure their devices could access. If students could access it for free and that was fine. So I would use it for the next meeting. It was like a trial-and-error process before providing the learning activity. (T15, interview, April 19, 2023)

Even though teachers perceived several educational software to implement in English classrooms, that software preserved certain functions for specific purposes. Some teachers accepted to subscribe to some educational software to derive certain specific functions to serve learning activities. In contrast, some teachers sought out other software which appropriately served their learning activities instead.

> Actually, some software was created for some activities. For example, I used Padlet a lot for my teaching instruction. I would see many limitations of this software. I thought that the functions of this software were not designed to serve different types of learning activities. (T5, interview, March 10, 2023)

> I would find another software which was similar to the previous software, but the new software did not have the same functional limitation. For example, I asked students to engage in Kahoo, but this software limited a number of participants. There were only 20 students who could join it. So I changed to use another software such as Quizzes. (T7, interview, March 13, 2023)

As seen from the response derived from teachers' descriptions, EFL university teachers encountered several problems when utilizing different technologies to promote students' critical thinking skills. However, teachers attempted to overcome those problems with their solutions which were associated with students, teachers, and technology.

2. Supports for technology integration

The last theme in response to this research question was supports which EFL university teachers commanded for their effective technology integration to promote students' critical thinking skills. Teachers expressed clearly what the university should provide for teachers. As a result, teachers could effectively implement several technologies to encourage students to think critically during English learning activities. The important descriptions derived from teachers were categorized as teacher-related and technology-related support. In terms of support for teachers, various training courses on how critical thinking skills were promoted through technology-implemented English instruction were required. Meanwhile, providing appropriate classroom devices, educational software with full functions, and a stable Internet signal were mostly suggested for technology-related support. As seen from those supports, it could imply that students' critical thinking skills could be developed better with technology-implemented English instruction whether teachers were more knowledgeable on how to integrate technologies to foster those skills. Furthermore, technologies integrated into English language learning activities should be fully well-prepared for providing their functions.

2.1 Teacher-related support

For the first subtheme, primary teachers indicated that teachers should be offered certain training courses relating to how to employ different technologies in

English language teaching. In addition, those courses should offer teachers how to promote critical thinking skills through learning activities with several technologies.

> It was nice for teachers to have training. It was not only on how to use hardware and software but also how to properly use them to promote critical thinking skills in the classes. (T13, interview, March 15, 2023)

> I would like to have training courses relating to how to integrate technology to promote critical thinking skills. As a result, teachers might have the same knowledge on how to teach and encourage students' critical thinking skills. (T2, interview, March 22, 2023)

> I thought it would be good to have training courses to introduce new websites or other various technologies that I never knew. I believed these technologies were enough for my learning activities, but there might be better technologies which I had not known before. (T8, interview, April 4, 2023)

As seen from teachers' responses regarding teacher-related support, a majority of teachers considered that it was a valuable opportunity to perceive the knowledge of innovative technology implementation and encouragement of critical thinking skills in English language teaching.

2.2 Technology-related supports

For this subtheme, teachers provided different perceptions towards essential supports regarding technology to promote students' critical thinking skills in English learning activities. Those supports which the university should offer for teachers consisted of digital devices in the classrooms, educational software licenses, and stable internet connection.

When the university encouraged teachers to integrate various technologies into their instruction, common digital devices such as computers, projectors, and so on should be appropriately provided in the classrooms. Therefore, teachers could utilize provided devices cooperating with educational software to offer students effective language learning activities.

> I would like the university to support classroom devices because if there were appropriate devices in the classes, I did not have to bring a speaker or a microphone. (T2, interview, March 22, 2023)

> There were not microphones in some classrooms, so I had to bring my microphone and plugged there. Moreover, the projectors were not clear in some classrooms. I had a class at one old building, and the projector did not work well. So I used the classroom television, but it was very small. (T13, interview, March 15, 2023)

In addition, to effectively promote students' critical thinking skills with technology integration in English learning activities, teachers expressed that educational software with full licenses such as quizzes, online games, and so on should be provided to teachers because teachers could integrate that software to serve their various purposes of instruction.

> I would like a premium version of educational software such as Kahoot, Mentimeter, and so on because I could allow a large number of students to participate in that software during learning activities. (T1, interview, March 10, 2023)

> I would like digital support from the university, such as educational websites with a subscription. For example, I thought that Kahoot was very good for evaluating students' understanding, but several teachers did not use it because they had to pay for a premium version. (T6, interview, March 10, 2023)

> Software licenses should be supported by the university. In some cases, I could seek out another software instead of the software with functional limits. Actually, I believed that most software provided all useful functions but it required a subscription. I thought if I had software with a premium version, it would be helpful for me and my students. (T7, interview, March 13, 2023)

After teachers presented their views of supports regarding appropriate digital devices in the classrooms and educational software with premium version, some teachers required the university to improve internet connection or maintain the internet

to be stable. Most educational software which teachers implemented into English learning activities were online platforms. If the internet signal was not stable during learning activities, it relatively affected students' engagement in the activities. Therefore, students' critical thinking skills were not promoted.

> I would like a fast and stable internet because online technology could not use without the internet. (T12, interview, April 21, 2023)

> I could create many activities with a good internet signal. Some interesting activities were available online. For some lessons, I could not provide clear examples. For example, the lesson was about different types of music. I presented Metallica which was one type of music. So I could show this type of music from online platforms to my students. (T5, interview, March 10, 2023)

All in all, EFL university teachers suggested practical solutions for different problematic issues that teachers experienced when various technologies, including hardware and software, were integrated into English language instruction to assist students to think critically. Furthermore, teachers provided significant support which the university should offer them to increase their effective English instruction with technology utilization.

1.6 What are the factors that influence teachers' technology integration to promote students' critical thinking skills?

This research question aimed to investigate the influential factors associated with EFL university teachers' technology integration to promote students' critical thinking skills in English language teaching. Teachers provided deep descriptions of their experience in using technology in English instruction to foster critical thinking skills, and there were a number of significant issues derived from those descriptions. These issues were grouped into teacher-related and student-related factors.

Table 4.6 A summary of themes and subthemes: influential factors of technology integration

Themes	Subthemes	Percent of opinions
1. Teacher-related factors	1.1 Convenience to deliver learning activities	38.9
	1.2 Adapting teaching styles with technology	22.2
	1.3 Consistency and appropriateness to deliver learning activities	11.1
	1.4 Promoting well-organized instruction	5.6
	1.5 Encountering new technology	5.6
	1.6 Technology integration influenced by teacher	5.6
	1.7 Teacher's beliefs	5.6
	1.8 Promoting teacher's profession	5.6
2. Student-related factors	2.1 Promoting student's motivation	22.2
	2.2 Promoting student's participation	22.2
	2.3 Technology integration influenced by students	11.1
	2.4 Trends of using technology	11.1
	2.5 Promoting students to share their thoughts or opinions	11.1
	2.6 Promoting student's understanding of learning activities	11.1
	2.7 Promoting classroom enjoyment	5.6
	2.8 Promoting students to explore information	5.6

1. Teacher-related factors

When teachers were asked what affected the technology utilization in English language teaching to promote students' critical thinking skills, most teachers indicated that the most significant factor was regarding teachers. There were a wide range of factors relating teachers, for example, teacher's beliefs, teacher's profession, well-organized instruction, and so on. However, teachers mentioned that three factors, namely convenience to deliver learning activities, adapting teaching styles with technology, and consistency and appropriateness to deliver learning activities, most influenced their instruction with technology implementation. As seen from factors associated with teachers, it could imply that teachers aimed to integrate different technologies into English language learning activities to serve their instruction. No

factor derived from teachers' experiences was related to promoting critical thinking skills in English language instruction. Therefore, teachers should promote their sense of employing technologies in English instruction along with promoting students' critical thinking skills.

1.1 Convenience to deliver learning activities

For this subtheme, the responses derived from the interviews explained that most teachers implemented various technologies in English classrooms because those technologies offered teachers helpful and appropriate functions for effective English instruction.

> I think it is convenient for the students. I don't want a lot of materials that I have to bring at any time. Traditionally, we brought a lot of stuff. Now I have a laptop and applications. For example, when I use a laptop, it is more convenient for me. It is comfortable and it affects my teaching. The flow of instruction is good because it is comfortable. (T9, interview, April 21, 2023)

> It is convenient for teachers. I can create a conversation with my students while waiting for other students who have not come. In addition, students who forget to take their textbooks to the classes can see the lesson from the projector. To encourage students to participate in learning activities, I integrate Padlet for students. I think it can motivate students to think and learn better. (T11, interview, April 7, 2023)

1.2 Adapting teaching styles with technology

Certain teachers revealed valuable information about their experience in using technology to promote critical thinking skills in English language teaching. Teachers realized that students' learning behaviors were intensely different from teachers' learning behaviors in the past. Therefore, teachers were required to redesign their instruction with technology that was appropriate for students.

> I think that my generation is relatively different from the students' generation. My learning experience can't compare to students' learning experience. So I have to study what trends in students' learning styles are, and I have to adapt

them to my instruction. For example, students satisfy to produce their tasks with their devices because students realize the value of those tasks. (T1, interview, March 10, 2023)

We are now in the technology era, and the students in this generation want technology. So I have to change my style to reach students' needs. I can't let them learn with the old style. Students now use technology, and I have to use technology as well. For example, students are at the university level, and then they have to go for a job. Most jobs have to use technology. It is useful for students to know how to use technology. Now students are trained to use technology in the classrooms. This prepares students for the job in the future. (T10, interview, April 19, 2023)

1.3 Consistency and appropriateness to deliver learning activities

When teachers discovered new hardware and software for their language learning activities, the most important matter that teachers considered before implementing it in the activities was whether those technologies were consistent with language skills.

I think software functions should be consistent with the language skills which I am teaching. For example, I integrated VistaCreate into my writing activities. This software helped students to create short paragraphs. Moreover, students could design beautiful templates by adding pictures relating to the topics. It relatively motivated students in learning activities. (T3, interview, March 15, 2023)

For some language learning activities, especially vocabulary activities, I explained the meanings of vocabulary to students, but students couldn't understand. I integrated media such as pictures for those activities. As a result, students saw those pictures and thought of the words' meanings. However, I asked students some questions while they were seeing those pictures. (T6, interview, March 10, 2023)

According to the responses regarding teacher-related factors, employing different technologies affected EFL university teachers in various aspects. Technology integration encouraged teachers to provide students with learning activities more comfortably. Furthermore, teachers improved their instruction with several technologies to fit current students' learning styles. When utilizing technologies in English classrooms, teachers thoughtfully selected technology that effectively promoted students' English language skills.

2. Student-related factors

EFL university teachers described their views on what profoundly influenced their technology implementation to encourage students to think critically in English classrooms. Teachers mentioned that certain factors that involved their students shaped teachers' using technology for learning activities. The descriptions derived from teachers' experience revealed that influential aspects relating to students were promoting classroom enjoyment, increasing comprehension of the lessons, and so on. Nonetheless, from teachers' views, the two most powerful factors regarding students that influenced teachers to employ various technologies were students' motivation and participation. As seen from the influential factors that shaped teachers to create technology-implemented English instruction for fostering critical thinking skills, it could imply that teachers were not consciously aware of promoting critical thinking skills when a range of technologies were integrated into English instruction. They were mostly concerned about promoting students' participation and motivation in English teaching and learning. Therefore, teachers should develop their sense of increasing critical thinking skills in technology-implemented English language learning activities.

2.1 Promoting student's motivation

To integrate different hardware and software for language learning activities, one of the significant issues involved encouraging students' motivation. Teachers revealed that students possessed low motivation in learning English. However, implementing several technologies in learning activities could improve students' motivation and encourage them to become active students.

> I wanted to motivate everyone in the class because English is a very boring subject. The students said they didn't need to learn English. They had to take the course to pass the degree. However, after I implemented technology for the classroom activities, my students were more motivated and active. (T10, interview, March 19, 2023)

> I employed technology in my instruction because it was appropriate to promote students' motivation. For example, I asked students to present the answers for the activities. Students with high motivation repeatedly showed the class the answers. To implement some technologies for the activities, students were more motivated to share the answers with the class because no one knew who presented those answers. (T6, interview, March 10, 2023)

2.2 Promoting student's participation

The valuable information derived from teachers indicated that students' participation was another key issue that encourage teachers to use technology in their instructional practices. When students engaged in certain language learning activities with several technologies, students practiced their English language abilities, and their critical thinking skills were developed at the same time.

> When I used technology in my class, the students could participate more. They could engage in class activities more. They were more interactive and active. (T10, interview, April 19, 2023)

> There were a lot of students in my class, so I could not focus on each student's participation. Therefore, I integrated Jamboard into my learning activities. So I could see students' participation when they answered questions through Jamboard. Moreover, I could know who answered questions, and students could see their classmates' answers. (T7, interview, March 13, 2023)

As seen from teachers' deep descriptions, students were considered to be a significant factor that drove teachers to integrate various technologies into English learning activities. Certain hardware and software were used to motivate students to

primarily focus on learning activities. Meanwhile, students provided their active participation in learning activities during the class.

Aspect 2: Thai EFL university students' perceptions towards learning with technology integration to promote their critical thinking skills

- What are Thai EFL university students' perceptions towards learning with technology integration to promote their critical thinking skills?

This research question aimed to investigate students' perceptions when EFL university teachers integrated various technologies into English language teaching. The responses derived from the interviews provided their perceptions of the learning experience in using technology in English language classrooms. The important statements were grouped into theme and subthemes as in Table 4.7.

Table 4.7 A summary of theme and subthemes: students' perceptions towards learning with technology integration

Theme	Subthemes	Percent of opinions
Advantages of technology integration to promote critical thinking skills	1. Applying technology skills to the future careers	19.5
	2. Promoting students' understanding of learning activities	17.1
	3. Promoting students' motivation	17.1
	4. Promoting students to evaluate information**	9.8
	5. Promoting students to explore information and evaluate it**	7.3
	6. Promoting students' English proficiency	7.3
	7. Convenience for learning activities	7.3
	8. Applying knowledge to learning activities	2.4
	9. Consistency and appropriateness to learning activities	2.4
	10. Promoting students to analyze information**	2.4
	11. Promoting students to share their thoughts or opinions**	2.4
	12. Promoting students to solve problems with the familiar technology	2.4
	13. Learning the use of new technology through learning activities	2.4

Remarks: **The subthemes are relating to critical thinking skills.

Advantages of technology integration to promote critical thinking skills

The views derived from the students' interviews indicated that Thai EFL university students considerably gained a number of advantages when EFL university teachers integrated technology into English language teaching. Generally, students could apply several technologies which their teachers used in the class for future careers. Furthermore, students intensely developed their understanding of language learning activities with technology implementation. Nonetheless, students suggested that their aspects of critical thinking skills were promoted when teachers employed technology in the class.

1. Promoting students to evaluate information

Certain students revealed that they were encouraged to decide what they should do or assess information perceived from various resources. Teachers provided their instruction with certain content, and students compared their understanding of the content with knowledge perceived from the past experience.

> It helped me to make a decision easier. Before I do something, I would think thoughtfully about it. For example, I could make any mistake if I quickly did something. I had to think carefully about what I wanted to do and evaluate its overview. This process helped me realize how good it was if I did. (S9, interview, February 15, 2023)

> It made me carefully consider the information which I had perceived. So I could compare the knowledge that I obtained from high school with the knowledge I just gained from teachers at university. I could question whether the knowledge of the same issue was different. (S10, interview, February 15, 2023)

> Using several technologies encouraged me to analyze the information that I researched. For example, teachers assigned the class to create a video. I had to think about the content and analyze it for a conversation. Then I filmed the video and submitted it through an online platform. (S12, interview, January 25, 2023)

2. Promoting students to explore information and evaluate it

Students expressed that using technology in English classrooms encouraged them to discover more relevant information. After students gained enough information derived from several resources, they were promoted to evaluate gathered information if it was appropriate or consistent with the learning activities.

> When technologies were implemented in learning activities, I could explore information immediately. For example, I accessed the internet for my target information. I was confused about how sentences were constructed with this tense. I could search the internet on how this tense was used, but I had to think if it was correct information. (S4, interview, February 18, 2023)

> I connected to different websites for searching the knowledge I looked for. I had to study what the information was on this website and compared it with the information from other websites. Then I evaluated what similar information was. This process made me more confident to communicate with teachers. (S6, interview, February 25, 2023)

> If there was no technology integration in language learning activities, I had to ask teachers if my response was appropriate. In contrast, using different technologies in the activities encouraged me to learn faster. I did not have to wait for teachers and ask for the answers. I could search for information and assess if it was correct and appropriate. (S16, interview, February 10, 2023)

3. Promoting students to analyze information

Another aspect of critical thinking skills that were promoted during English learning activities with technology integration was analyzing information. A few students mentioned that they were asked to analyze some examples of the classroom assignment in order to conduct their own work.

> Using technology in English classrooms encouraged me to analyze information for conducting better assignment. For example, teachers assigned a task for the class. Teachers provided examples of that assignment, and I did

> not perceive how to conduct it. So I could study those examples, analyze them, and develop my work for that assignment. (S5, interview, February 25, 2023)

4. Promoting students to share their thoughts and opinions

During English learning activities, students were required to work in a group with their group mates. Students in each group had to brainstorm their ideas for the questions and share those ideas with other students in the same group or present the ideas to the class through technology.

> Learning in a group was useful for me when technologies were integrated into learning activities. Students cooperated with their groupmates and shared the answers with each other. Moreover, students could brainstorm the answers and present them to the teachers. (S6, interview, February 25, 2023)

All in all, using technology in English language teaching could provide students with general benefits, including applying encountered technology for their future jobs, improving their understanding during learning activities, and so on. Particularly, the technology utilized by EFL university teachers could promote certain aspects of students' critical thinking skills such as exploring more information, sharing thoughts or opinions, and so on.

CHAPTER 5

DISCUSSION AND CONCLUSION

The purpose of this chapter aimed to present the essence of the experience of utilizing technology in English language teaching to promote students' critical thinking skills. The summary of the research findings was demonstrated to offer an overview of the results derived from the previous chapter. To provide similarities and differences between the results and the existing literature, each theme was concluded and discussed. The implication of the study was provided to encourage students' critical thinking skills through learning with technology for the future. Eventually, the research limitations and recommendations were presented for further research.

5.1 Summary of the study

This study aimed to explore EFL university teachers' lived experience in using technology in English language teaching to promote Thai EFL university students' critical thinking skills. Furthermore, the other purpose of the study was to investigate Thai EFL university students' perceptions of learning with technology integration to promote their critical thinking skills. To grasp the essence of teachers' and students' experiences, a phenomenological research design in a qualitative research approach was implemented. To perceive the experiences of two groups of participants, phenomenological semi-structured interviews and class observation were employed to elicit deep information about the experiences.

The valuable descriptions derived from interviews and class observation were analyzed, and the important units of meaning were listed. After underlining the significant statements, they were clustered to develop themes. To answer research questions relating to EFL university teachers' lived experience, six themes were generated, namely technology integration in English language teaching, instructional practices, the effectiveness of technology integration, problems in using technology, achievement in employing technology, and influential factors of technology integration. In addition, students' perceptions toward learning with technology integration were considered as a theme to respond to the research question regarding Thai EFL university students. These themes were discussed to demonstrate the

similarities and differences between the results and the existing literature. An overview of themes and subthemes were presented in Figure 5.1.

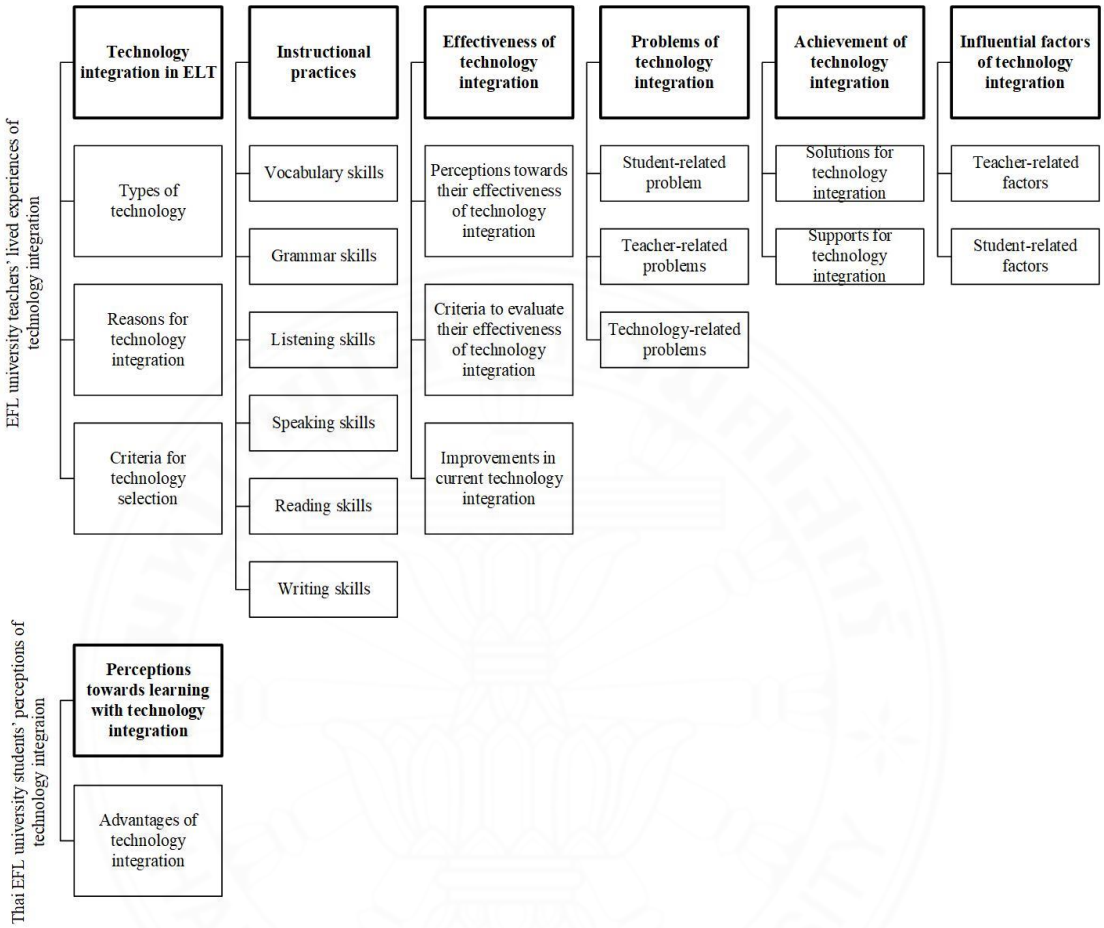

Figure 5.1 A summary of research results

5.2 Discussion of the study

For each theme in this section, it would start by describing the results derived from teachers' and students' experiences and perceptions regarding the research questions to provide vital points for discussion. The similarities and differences between the results and the existing literature would be offered.

5.2.1 Discussion of research question 1.1 in aspect 1: What types of technology do teachers integrate into their instruction to promote students' critical thinking skills?

For using technology in English language teaching, teachers revealed that two primary types of technology that were frequently employed for learning activities included hardware and software. For hardware, teachers commonly utilized several digital devices provided in the classroom such as projectors, microphones, and speakers. Furthermore, teachers indicated that their laptops, mobile phones, and tablets were cooperated with digital classroom facilities for their teaching practices. For software, various types of software which teachers generally integrated into English learning activities consisted of textbook courseware, word processing software, and web resources.

To utilize those types of technology in English language teaching, teachers provided several reasons to encourage them to use those technologies. Most teachers revealed that using technology helped teachers to comfortably deliver their learning activities. Certain teachers expressed that various technologies utilized in their instruction were consistent with English language skills. As seen from these reasons derived from teachers' perceptions, a majority of reasons mentioned were not related to promoting students' critical thinking skills in English classrooms. Nonetheless, there were certain reasons regarding encouraging critical thinking skills mentioned. A small number of teachers usually allowed their students to express thoughts or opinions toward learning activities with different online resources. Furthermore, few teachers revealed that implementing different technologies in language learning because of encouraging students to explore more information and provide reasons to support the ideas.

To perceive how these hardware and software were selected for English language teaching, a number of criteria for technology selection were provided. Again primary criteria were not in response to promoting critical thinking skills. A majority of teachers revealed that various technologies were integrated into language learning activities because they were suitable and consistent with learning activities. Additionally, some teachers identified that technologies were used in the learning activities because those technologies were available. However, few teachers provided

certain criteria for selecting technologies which were related to promoting some aspects of critical thinking skills. A small range of teachers integrated some web resources to deliver their learning activities because students could present their thoughts and opinions through those online resources. Moreover, some software implemented in the activities could encourage students to provide reasons to strengthen their ideas.

According to a deep description of teachers' experience, the reasons for integrating a range of technologies and criteria of technology selection for English instruction did not fully aim for promoting critical thinking skills. Utilizing technologies was basically for delivering English instruction and language learning activities. Interestingly, certain aspects of critical thinking skills were unconsciously promoted through teachers' use of different technologies, such as exploring more information, sharing thoughts and ideas about the information, and providing reasons to strengthen those thoughts and ideas. Teachers who provided the experiences of promoting critical thinking skills through their instruction revealed that they were not aware that they were promoting students' critical thinking skills during English language activities. It could imply that EFL university teachers spontaneously fostered students' critical thinking skills. Therefore, developing critical thinking skills in English courses in GenEd should be appropriately increased through well-planned instruction with technology integration because these types of skills were relatively significant to students' achievements.

As seen from a majority of reasons that EFL university teachers utilized different technologies for their instructional practices. These results were consistent with types of technologies (Slavin, 2009) in which various technologies were implemented based on purposes of technology integration, purposes for instruction and purposes for learning. Some technologies were used for instructional activities. For example, EFL university teachers utilized textbook courseware to present the lesson for their classes and it helped their students to closely follow the lesson. Another purpose of technology integrated into English language teaching was for learning activities. Some students were encouraged to discover more information regarding the lesson through the internet and shared their thoughts or opinions through communication software. Therefore, the notion of technology integration in English language teaching generally bases on different purposes of using technologies.

To deeply consider using several technologies, teachers employed those technologies because their functions appropriately served teachers' purposes which was consistent with the suggestion of technology integration (Roblyer, 2006). Various technologies would be employed in instructional or learning activities depending on their functions. Additionally, those functions had to facilitate teachers to promote students' critical thinking skills. For instance, one EFL university teacher utilized an online spreadsheet to allow the students to express their opinions towards the questions. Furthermore, another teacher encouraged students to discover more information relating to the topics discussed by employing the devices such as smartphones and tablets. As a result, the students could gather relevant information from different online resources.

Even though the results indicated that critical thinking skills were promoted through technology-implemented English language activities according to teachers' purposes and the functions of different technologies, the results indicated that technologies could be implemented in English language classrooms based on their genres, namely informative and communicative technologies to foster some aspects of critical thinking skills such as analysis and evaluation (Liang, 2023). Informative technology encouraged students to access a variety of information such as videos, sounds, and texts while communicative technology fostered teacher-student communication or student-student interaction in the virtual platforms. However, in terms of using technologies in the educational context, it would be more appropriate to categorize technologies according to the purposes of teachers and the functions that were employed to serve those purposes to promote critical thinking skills in English teaching and learning.

Therefore, to promote critical thinking skills in EFL, technologies would be categorized by their purposes. Additionally, the functions of different technologies would be considered to serve those purposes. It is relatively constructive as to whether EFL university teachers could indicate what purpose technologies were integrated into their language classes and which functions technologies could provide for English activities to promote students' critical thinking skills. Critical thinking skills would be increasingly promoted through technology-implemented English language classrooms. This process was presented in Figure 5.2

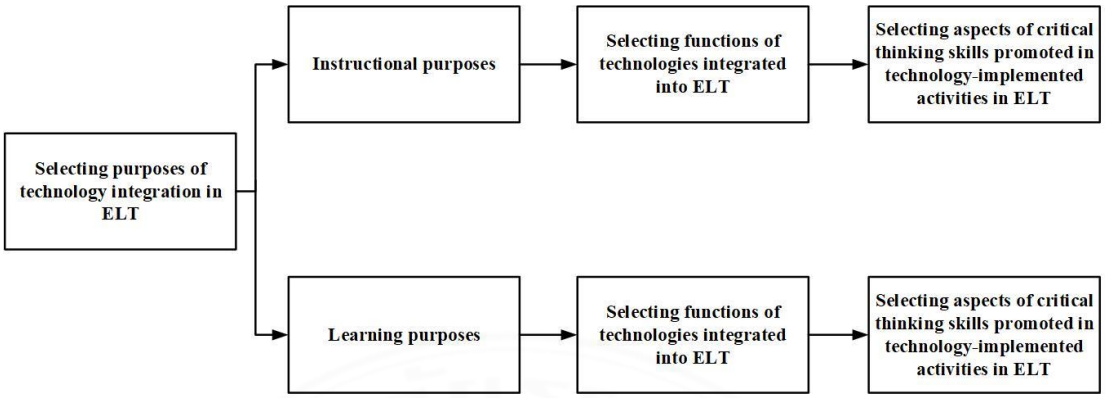

Figure 5.2 A process of an appropriate types of technology integration in ELT

5.2.2 Discussion of research question 1.2 in Aspect 1: How do teachers integrate technologies into their instruction to promote students' critical thinking skills?

For instructional practices with technology integration, EFL university teachers indicated that a number of technologies were implemented into different English language skills, including listening skills, speaking skills, and so on. To promote critical thinking skills in English language teaching, there were some language skills, namely grammar, reading, and writing skills that certain aspects of critical thinking skills were frequently encouraged with technology integration.

For grammar activities, one teacher revealed that she implemented several types of hardware to allow her students to show their answers for grammar exercises. Furthermore, to encourage students to present their thoughts in learning activities, various web resources, such as Kahoot, Edform, and so on, were integrated. After students' thoughts or opinions were presented to the classes, some teachers kept promoting students' critical thinking skills by asking them to provide reasons to support their thoughts.

Apart from English grammar activities, technologies were implemented to promote students' critical thinking skills in English reading activities. At the warm-up step of the reading activity, one teacher motivated students by questioning. After students encountered the teacher's question, they would explore more information about that question by using their devices such as mobile phones, and share the

information with the class. Furthermore, another teacher required students to express their reasons to support the information provided to the class.

Eventually, students' critical thinking skills were promoted in English writing skills with technology integration. One teacher introduced software that facilitate students to create writing assignments, but students and their groupmates had to determine what relevant information should be included in their writing assignments. In addition, the teacher presented another software for assessing grammar. When the teacher demonstrated the grammatical errors through the software, students were asked to share their opinions on how to correct those errors.

As seen in certain activities for several English language skills, the result of technology integration in English language teaching was consistent with those of Hsu (2016) who suggests that language arts received the most attention of technology integration. Moreover, English language skills that technologies were frequently implemented consist of grammar, reading, and writing skills. It could imply that integrating several technologies in English language teaching was appropriate for certain language skills activities such as reading, writing, and grammar learning activities. In addition, some aspects of critical thinking skills were frequently promoted such as discovering more information, sharing thoughts and opinions, and evaluating information in those mentioned language skills activities. These aspects were consistent with the notion of developing critical thinking skills (Garrison et al., 2000) and revised Bloom's taxonomy suggested by Anderson et al. (2001).

Critical thinking skills could be encouraged through several activities in an educational context. Teachers could provide a wide range of learning activities with integrated technologies to enhance various aspects of critical thinking skills. For example, teachers asked students questions which were relevant to the lesson to associate students' understanding with the lesson. This meant that teachers were promoting critical thinking skills in Garrison et al. (2000)'s triggering events phase. Furthermore, students were required to explore more information and exchange it with their classmates. This referred that teachers were developing aspects of critical thinking skills at a higher level called the exploration phase.

To develop critical thinking skills in English language teaching, EFL university teachers had to be aware that different aspects of critical thinking skills, namely exploring more information, sharing thoughts and opinions, evaluating information, and providing reasons to strengthen the ideas could be promoted in different English grammar, reading, and writing skill activities. Therefore, teachers had to consider how a number of technologies could be appropriately employed in order to foster those aspects of critical thinking skills in English language classrooms. A connection between English language skills and implementing technologies to promote critical thinking skills was presented in Figure 5.3.

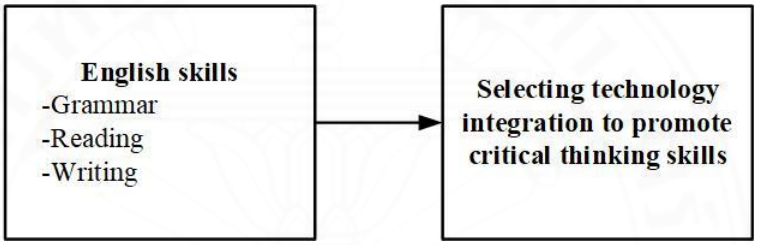

Figure 5.3 A relationship of English skills and technology integration to promote critical thinking skills

5.2.3 Discussion of research question 1.3 in Aspect 1: How effective do teachers perceive their technology integration to be in promoting students' critical thinking skills?

When EFL university teachers were required to determine their effectiveness of utilizing technologies to encourage students to think critically in English language classrooms, teachers assessed their effectiveness into three levels, namely high, moderate, and low effectiveness. Certain teachers considered their competencies of technology integration in English classrooms as high effectiveness. Their perceptions indicated that teachers could properly implement various technologies both hardware and software their instruction. However, a majority of teachers thought that their using technologies in English language teaching was moderate because students' critical thinking skills were not intensively promoted through their use of technology. The teacher who possessed low effectiveness in technology implementation revealed that she did not know new technologies when compared with her colleagues, and she frequently consulted her colleagues on how to employ them for her instruction.

After EFL university teachers provided their perceptions toward the effectiveness of technology integration to promote students' critical thinking skills, the teachers revealed the criteria which they implemented to determine how effective their technology utilization was. Most teachers indicated that if students could fully engage in language learning activities with various technologies, it reflected that teachers' technology integration was relatively effective. Another criterion that identified teachers' effectiveness was students' understanding of the lesson in learning activities. Effective technology integration could facilitate students to comprehend the lesson and demonstrate their understanding of language activities accurately. The last criterion frequently mentioned by teachers was students' motivation. If teachers delivered their English instruction with effective technology implementation, students could build a greater motivation to concentrate on the language learning activities.

As seen from the criteria that EFL university teachers used to examine the effectiveness of technology integration in their instruction, one of the criteria, namely students' participation, was consistent with that of Benson (2011) who suggested that effective learning initiates from the active participation of learners in learning activities. It could imply that the more students actively engaged in language learning activities, the more effective technology implements in English language teaching was. Therefore, EFL university teachers would discover appropriate innovative technologies and design how those technologies were suitably employed in language learning activities to promote students' motivation along with critical thinking skills.

According to a variety of technologies currently utilized in English language teaching, teachers provided their perceptions about which technologies would be improved in terms of increasing effective technology integration and critical thinking skills. A number of teachers indicated that software licenses had to be provided for teachers because there were various useful functions to serve different purposes of English instruction to promote critical thinking skills. Additionally, certain teachers suggested that they needed to improve their knowledge of using technologies to promote students' critical thinking skills in English language activities because if teachers possessed different teaching techniques for promoting critical thinking skills, they could intensively increase students' critical thinking skills in their English classroom.

The result that EFL university teachers need to improve their knowledge to implement technologies for promoting students' critical thinking skills is in line with those barriers to technology integration of Hsu (2016). She stated that one of the technology integration barriers was teachers' lack of technology training. Similarly, these teachers' voices regarding requiring the training were consistent with the notion of teacher's knowledge suggested by Koehler and Mishra (2008). This is, teachers had to possess the core bodies of knowledge, namely content knowledge, pedagogical knowledge, and technology knowledge to provide effective instruction. Therefore, to promote EFL university teachers' technology knowledge and skills, the university had to provide different types of training courses that offered teachers opportunities for exposure to innovative technologies. Not only training courses relating to technology integration in English language teaching, EFL university teachers needed to be trained in how those innovative technologies could be employed to foster critical thinking skills in English language learning activities.

5.2.4 Discussion of research question 1.4 in Aspect 1: What problems do teachers encounter when integrating technologies into their instruction to promote students' critical thinking skills?

When various technologies were implemented in English language teaching, EFL university teachers encountered different problems, namely student-related problems, teacher-related problems, and technology-related problems. Firstly, most teachers identified that a primary problem that teachers confronted when implementing new software in their instruction was students' lack of understanding of how to use the software. Some students had never encountered the software before. As a result, they did not know how to use the software to participate in language learning activities. This result is consistent with a barrier to technology integration in terms of students' lack of technology knowledge and skills (Oncu et al., 2008; Hsu, 2016). When innovative technologies were implemented in the classrooms, students were not expected to know clearly how to use those technologies. Therefore, students had to be trained in the common use of those technologies before they were employed to facilitate language learning activities in the classrooms.

Secondly, certain teachers revealed another type of problematic issue related to teachers themselves. Some teachers frequently mentioned that preparing the appropriate teaching aids with technologies was a primary problem for teachers. To construct the proper online teaching aids for English instruction, teachers had to explore relevant resources for the lesson and assess whether those resources were included in the selected online platform. Moreover, another teacher-related problem was the teacher's lack of understanding of how to connect high-technology devices. One teacher mentioned that she confronted the problem of connecting smart interactive television. To discuss teacher-related problems, teachers operated a number of tasks if they desired to implement various technologies into their instruction and teaching materials. In addition, teachers encountered the problem of the device connection when digital devices provided in the classrooms were high-technology. These results were consistent with those of Oncu et al. (2008) who suggested the components of technology integration. One of the important components, when innovative technologies are employed in the classrooms, is teachers' technology knowledge and skills. Therefore, EFL university teachers who brought several technologies to English language teaching needed to perceive the understanding of using those technologies. Moreover, teachers needed to gain some experiences with innovative technology-implemented instruction before implementing technologies in English classrooms.

The last problematic issue involved technology itself. Most teachers indicated that the internet signal was a key problem when various technologies were implemented in English language teaching. A number of teachers expressed that when the internet was not stable, students could not access the provided online educational software and participate in learning activities. Another problem that involved technology was the readiness of digital devices. Certain teachers provided their perceptions that some devices such as mobile phones, laptops, and so on were not compatible with certain software. As a consequence, teachers and students who possessed those devices could not access them. The last problem frequently mentioned by teachers was limited software functions. Some teachers encountered appropriate software for their instruction, but that software might provide some functions to implement and the rest of the functions were preserved for a subscription. This result is consistent with the first-order barrier (Ertmer, 1999) and availability (Oncu et al., 2008). The first-order

barriers are relating to different types of resources such as equipment and supports. In terms of availability, teachers were not provided adequate instructional technologies to implement in classroom activities. Regarding technology-related problems, EFL university teachers repeatedly encountered unstable internet and inadequate software functions to deliver effective English instruction. Therefore, to encourage effective instruction and language learning activities to promote critical thinking skills, technology-related support had to be emphasized. A connection between problems and technology integration to promote critical thinking skills was demonstrated in Figure 5.4

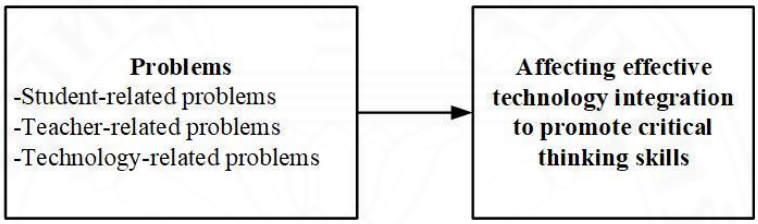

Figure 5.4 A relationship of problems and effective technology integration to promote critical thinking skills

5.2.5 Discussion of research question 1.5 in Aspect 1: How do teachers solve the problems that they encounter when integrating technologies to promote students' critical thinking skills?

After EFL university teachers provided valuable descriptions of problematic issues encountered in technology implementation to promote students' critical thinking skills, they identified an achievement of using technology in English language teaching, including solutions for mentioned problems and supports for utilizing technologies in English language teaching. Firstly, teachers provided their solutions when confronting the mentioned problems in English instruction. For the student-related problem, students did not have any information about using selected software because they had never faced it in the learning activities before. As a result, teachers presented how to use the software for their students. This result is in line with the solution for student-related problem of Oncu et al. (2008) and Hsu (2016). It would be better to provide students with the knowledge to use technologies that were implemented in language

learning activities. Therefore, EFL university teachers had to be aware that students should be properly trained if technologies were first integrated into the learning activities.

To overcome teacher-related problems, technology-implemented teaching aids and materials for learning activities were sometimes not well-prepared because teachers might not review them and assess their appropriateness. Therefore, teachers indicated the solution that those technology-implemented teaching aids and materials had to be evaluated for their appropriateness before employing them in learning activities. The last teacher-related problem mentioned from teachers' experience was a lack of understanding of how to connect with high-technology devices. The teacher did not know how to link her laptop to smart interactive television. Therefore, the teacher contacted a technician to deal with this problem. This result was consistent with the solution of teachers' knowledge and skills which is one of the components of technology integration (Oncu et al., 2008). To help EFL university teachers to master using technologies in English language teaching to promote critical thinking skills, knowledge and skills relating to implementing technologies for instruction had to be provided. Teachers encountered useful innovative technologies for their instruction and they repeatedly practiced using those technologies. As a result, teachers become familiar with technology integration in English language teaching. Teachers were aware of what they should prepare if they implement technologies into the lessons, and they could solve any common technology problems immediately.

To overcome technology-related problems, teachers clarified effective solutions that were frequently implemented for the problems. When students were required to engage in certain online web resources, they sometimes confronted the unstable internet problem. Furthermore, teachers' devices could not access university Wi-Fi, so teachers could not employ selected online games for their classes. Therefore, in terms of students' internet problems, teachers required other students to share their internet with students whose internet was not stable. Regarding teachers' internet problems, teachers connected their devices with personal internet access instead. Another technology-related problem mentioned by EFL university teachers was the readiness of digital devices. The software that teachers implemented for language learning activities and students' devices such as mobile phones were not compatible.

To overcome this problem, their students were assigned to determine whether their devices could operate the software for language learning activities. The last technology-related problem was limited software functions. There were a number of educational software in web resources, but most software provided a few useful functions that were proper for language learning activities. Certain teachers overcame this problem by discovering other software which offered greater appropriate functions to serve their instruction. This result is consistent with the ideas of the first-order barrier (Ertmer, 1999) and the availability of technology integration (Oncu et al., 2008). To solve these technology-related problems, compatible devices for learning activities had to be offered. Moreover, stable internet and educational software with full functions had to be available and adequate for teachers to employ in their instruction to promote critical thinking skills.

To develop effective technology integration and students' critical thinking skills in English language teaching, teachers' perceptions derived from the descriptive information revealed that support relating to teachers and technologies had to be offered. For teacher-related support, a majority of teachers identified that if teachers desired to develop students' critical thinking skills in English language teaching, teachers had to be trained on how to utilize various technologies to promote different aspects of critical thinking skills through language learning activities. The other support that several teachers mentioned in their description was technology. Most teachers indicated that the most crucial technology-related support was offering appropriate classroom devices because these devices could facilitate teachers' instruction and effective learning activities for their students. Another significant support relating to technology was software licenses. Most educational software that teachers frequently employed provided a small range of functions for creating language learning activities. Therefore, software with a subscription was required for constructing a variety of effective learning activities to promote students' critical thinking skills. The last technology-related support was maintaining a stable internet signal. Teachers clarified their perceptions that integrating technologies could not operate without a good internet connection. Effective language learning activities could be constructed for English language teaching if the internet was stable.

The result of the support that EFL university teachers need when various technologies are implemented in their instruction to promote students' critical thinking skills seemed to be consistent with those of Oncu et al. (2008) who suggested that teachers' knowledge and skills of technology integration were one of different component that affects a decision of using technologies in the classrooms. Interestingly, EFL university teachers not only needed to be trained on how to implement technologies in English language teaching, but also they needed to know how those technologies could be used to promote critical thinking skills in language learning activities. A connection among solutions, support and effective technology integration to promote critical thinking skills was illustrated in Figure 5.5.

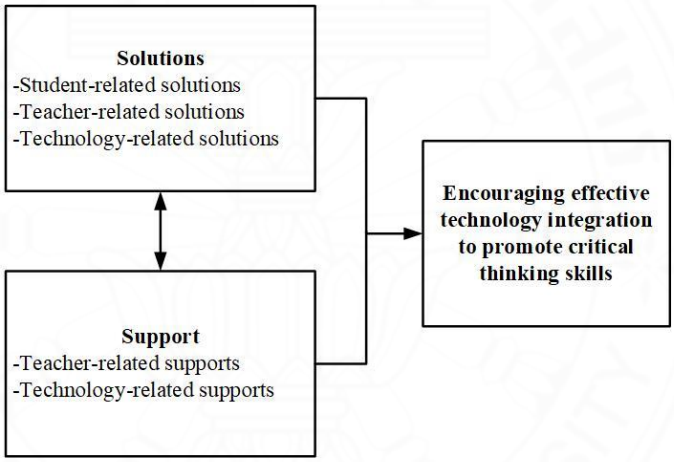

Figure 5.5 A relationship of solutions, support and effective technology integration to promote critical thinking skills

5.2.6 Discussion of research question 1.6 in Aspect 1: What are the factors that influence teachers' technology integration to promote students' critical thinking skills?

To employ several technologies in English language teaching, EFL university teachers indicated two influential factors that relatively affected their instruction to promote students' critical thinking skills. Those factors involved teachers and students. For teacher-related factors, suitability to provide English language learning activities was the most important factor that shaped teachers' technology integration to promote

students' critical thinking skills. Teachers clarified that their instruction was relatively convenient when several technologies were implemented to encourage students to think critically in learning activities. The second factor relating to teachers was modifying teaching methods with various technologies. From teachers' descriptions, when technology became an important part of lives, students' learning behaviors particularly changed. Therefore, teachers were required to change their teaching styles by integrating a number of technologies into their English language teaching. The last factor that involved teachers was appropriateness for language learning activities. Before various technologies were utilized in learning activities, teachers consider what language skills those technologies were used for and how they promoted those skills.

Regarding student-related factors, most teachers revealed that different technologies were employed in their instruction because they desired to encourage students' motivation toward language learning activities. When providing the learning activities with various technologies, students were more motivated to those activities. For the other student-related factor, using technologies in English language teaching could build students' participation in language learning activities. Students could more actively engage in provided learning activities if certain innovative technologies were included.

As seen in the result relating to student-related factors, EFL university teachers mentioned certain factors, namely students' motivation and participation as the criteria for implementing technologies in English instruction. It seemed that criteria and factors were interchangeably used for technology integration to promote critical thinking skills in English language teaching. The result of influential factors that affected technology integration was consistent with the ideas of critical components of technology integration (Oncu et al., 2008) and valuable beliefs (Ottenbreit-Leftwich et al., 2010). Both components of technology integration and valuable beliefs suggested that teachers and students, who were two out of various factors, affect technology integration in the classroom. Therefore, EFL university teachers had to completely realize how these factors shaped their technology implementation and how using those technologies promoted critical thinking skills in English language teaching. A connection between influential factors and technology integration to promote critical thinking skills was presented in Figure 5.6.

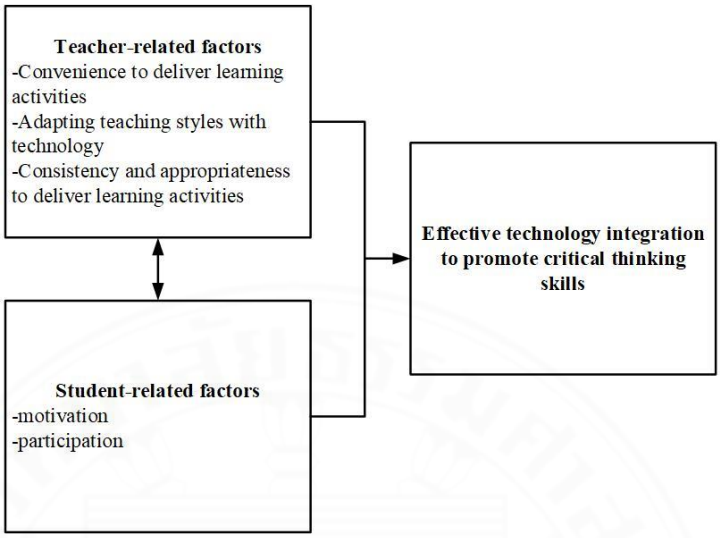

Figure 5.6 A relationship of influential factors and effective technology integration to promote critical thinking skills

5.2.7 Discussion of research question in Aspect 2: What are students' perceptions towards learning with technology integration to promote their critical thinking skills?

In response to students' perceptions toward technology integration promote students' critical thinking skills in English language teaching, students expressed the usefulness that they perceived from language learning activities. Even though a majority of benefits were not related to encouraging critical thinking skills such as using those technologies in future careers, developing students' understanding of language learning, and so on, students indicated their different aspects of critical thinking skills were enhanced. The first usefulness regarding critical thinking skills was evaluating the information. Teachers provided certain language learning activities that allowed students to assess whether new knowledge was similar to knowledge perceived from the past learning experience.

Furthermore, teachers encouraged students to find more information with their possessed devices during learning activities and required students to evaluate if the information was appropriate. Another aspect of critical thinking skills that were promoted through language learning activities with different technologies was

analyzing the information. With technology integration in English language teaching, students were provided some language examples or assignments and they could analyze those examples or assignments in order to construct their own tasks. The last benefit that involved critical thinking skills was that using technologies in language learning activities encouraged students to easily share their thoughts or opinions. After students cooperated with their groupmates to complete learning tasks or answer questions in language exercises, they were encouraged to share their thoughts about tasks or answers through online platforms for the class.

The result seemed to be consistent with the advantages of technology integration in the classroom. Using different technologies in learning activities could promote students' motivation, engage students in producing work, and help students to visualize problems and solutions (Shelly et al., 1999; Roblyer & Edwards, 2000; Thornton & Sharples, 2005; Roblyer, 2006). Therefore, EFL university teachers had to implement innovative technologies in English language activities to promote students' language learning achievement and critical thinking skills. A connection between technology integration in English language teaching and students' benefits was demonstrated in Figure 5.7.

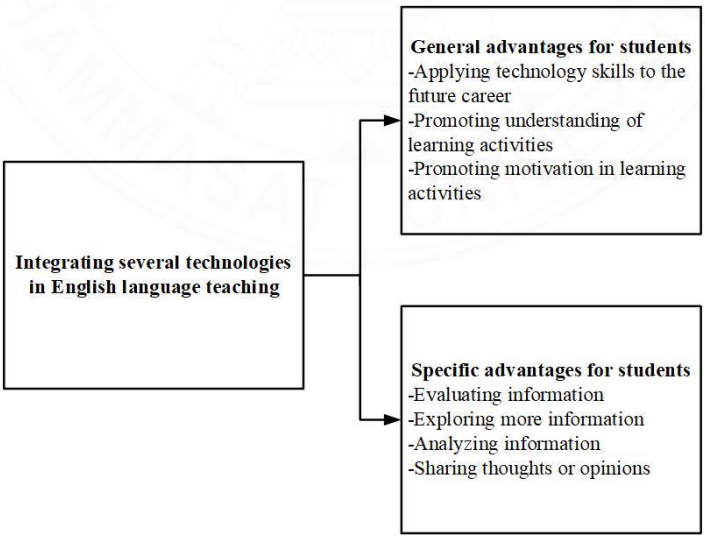

Figure 5.7 A relationship of technology integration and students' advantages of technology integration

According to the results and discussions of the present study, they were relatively constructive to address the gap in the field of ELT. A phenomenological qualitative research approach was implemented to conduct the present study which primarily focused on exploring not only EFL university teachers' experiences, but also students' experiences of promoting critical thinking skills through technology-implemented English instruction. The study provided valuable insights into what a wide range of technologies EFL university teachers implemented in their instruction and how those technologies were employed in terms of promoting critical thinking skills in English language learning activities. Moreover, it provided further insights into how teachers measured the effectiveness of technology integration to promote critical thinking skills, what problems teachers encountered and how they solved those problems, as well as what factors influenced teachers to deliver their technology-implemented English instruction in order foster critical thinking skills. It would be significantly beneficial for improving English language teaching and learning in terms of developing critical thinking skills with technology integration.

5.3 Implications of the study

In response to EFL university teachers' and Thai EFL university students' valuable descriptions and the results of the study, there are three important implications for future practice. These implications could be a direction to develop English language teaching and promote critical thinking skills.

5.3.1 Improving teachers' knowledge and skills of technology integration to promote aspects of critical thinking skills

From the descriptions of teachers' experiences and the results, it can be seen that teachers are the key person who are relating to the whole language learning activities. Furthermore, teachers are considered one of the limitations when several technologies are employed in language learning activities. Regarding the influential factors, teachers are still one of those factors that shape English instruction. As seen in the important roles of teachers in English language teaching, commonly teachers should

select the purposes of technology integration and then they enable to discover which technologies provide appropriate functions to serve those purposes for delivering effective English language teaching and promoting critical thinking skills. Moreover, teachers should be provided with different training courses about using technologies in English instruction and implementing those technologies to promote critical thinking through language learning activities.

5.3.2 Redesigning curriculum that integrated technologies to promote aspects of critical thinking skills

Another implication of the study is regarding English courses in the language and communication of the General Education courses (GenEd). As seen in the result of English instructional practices, a number of technologies are implemented in all English skills such as vocabulary, listening, and speaking skills. However, there are only three English skills, including grammar, reading, and writing skills that technologies are used to promote students' critical thinking skills. Therefore, English courses in GenEd should be redesigned to promote effectively different aspects of critical thinking skills through technology integration. For English skills that certain aspects of critical thinking skills are enhanced, the course makers can include additional learning purposes to encourage other aspects of critical thinking skills such as brainstorming information, synthesizing information, and so on. For English skills that teachers do not promote any aspects of critical thinking skills in English instruction, the course makers should design course learning activities that offer students to encourage some aspects of critical thinking skills.

5.3.3 Promoting the policy of effective technology-implemented learning and teaching

As seen in the results regarding problems and support, innovative technologies seem to be another crucial role in the technology integration to promote students' critical thinking skills in English instruction. EFL university teachers repeatedly mention that there are a number of problems relating to technology. Furthermore, teachers still require some support regarding technology for promoting critical thinking skills in English language teaching. Therefore, university administrators should realize that technologies in terms of hardware and software should be properly maintained or

adequately provided for integrating those technologies appropriately in English language learning activities. If the administrators promote the policy relating to this technology issue, using technologies in English learning and teaching can be more effective in terms of language achievement and critical thinking skills.

5.4 Limitation of the study

This phenomenological study aimed to investigate the essence of lived experience in technology integration to promote students' critical thinking skills at one of the Rajabhat universities in the Western region. Each Rajabhat university in this region designs English courses for the General Education curriculum. The limitation of the study is a context of a specific research site. The results of the study might not be generalized to the context of the other sites. Therefore, EFL university teachers from Rajabhat universities in this region might have different teaching methods and various technology implementations to promote critical thinking skills. These different practices could provide different perceptions toward technology integration, different problems and solutions, and different factors which influence teachers' technology integration in English language teaching.

5.5 Recommendations for future research

One of the results of the study suggested that critical thinking skills were promoted through several technologies for some English language skills. The first suggestion for future research would focus on specific English skills such as grammar, reading, and writing skills that technologies are implemented to encourage students' critical thinking skills in English language teaching. The exploration of specific English skills would provide deeper information on how technologies are used in specific English skills and which aspects of critical thinking skills are promoted by those technologies in specific language learning activities.

Another suggestion for future study is the effect of technology-implemented English language teaching training to promote critical thinking awareness. EFL university teachers expressed that teachers should be provided training courses relating to implementing technologies in English language teaching and promoting critical thinking skills through technology integration. Therefore, it would be constructive to

conduct a further study on this issue because it would provide empirical evidence of whether teachers' awareness of critical thinking skills is promoted after perceiving the training.

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APPENDICES

APPENDIX A

AN INTERVIEW GUIDE FOR TEACHERS

An interview guide for EFL university teachers

Interview question section A

A group of questions in interview section A allows EFL university teachers to tell about their background information. It includes a description of their life history, such as educational and occupational background, especially teaching experiences at the university level, and their general perspectives on technology integration and critical thinking skills in English language teaching. Therefore, the primary purpose of this section is to explore participants' background information, how they have perceived their teaching experiences in a university, and their common perceptions on using technologies and fostering critical thinking skills in English language teaching.

Items	Interview questions
1	Could you please introduce yourself and tell me about your educational background and working experience? กรุณาแนะนำตนเองและเล่าประวัติการศึกษาและประสบการณ์ทำงานของคุณ
2	How has your experience as an English language teacher at a university been? ประสบการณ์ในฐานะผู้สอนภาษาอังกฤษในระดับมหาวิทยาลัยของคุณเป็นอย่างไร
3	What is technology integration in English language teaching? การบูรณาการเทคโนโลยีในการสอนภาษาอังกฤษคืออะไร
4	What are critical thinking skills in English language teaching? การคิดอย่างมีวิจารณญาณในการสอนภาษาอังกฤษคืออะไร

Interview question section B

A group of questions in the interview section B allows EFL university teachers to express their lived experiences with concrete details on promoting students' critical thinking skills through utilizing technologies in the English language classroom. The teachers will provide and reflect details on different issues regarding types of technology utilized, instructional practices with technology integration, the effectiveness of their instruction with technology integration, problems and solutions of technology integration, and influential factors of technology integration. Thus, the purpose of this section is to elicit participants' recent experiences in vivid detail regarding the mentioned aspects of technology integration in English language teaching to promote students' critical thinking skills.

Items	Interview questions (Types of technology integrated to promote critical thinking skills)
1	What technologies have you used to promote students' critical thinking skills? คุณใช้เทคโนโลยีอะไรบ้าง เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
2	Why did you use those technologies to promote students' critical thinking skills? ทำไมคุณใช้เทคโนโลยีเหล่านั้น เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
3	What were criteria of selecting those technologies to promote students' critical thinking skills? คุณใช้เกณฑ์อะไรในการเลือกเทคโนโลยีเหล่านั้น เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา

Items	Interview questions (Instructional practices with technology integration to promote critical thinking skills)
1	Could you please describe your technology integration to promote students' critical thinking skills? กรุณาเล่าเกี่ยวกับการบูรณาการเทคโนโลยีของคุณ เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
2	Could you please give some examples of learning activities with technology integration to promote students' critical thinking skills? กรุณายกตัวอย่างของกิจกรรมการเรียนรู้ที่บูรณาการเทคโนโลยีเหล่านั้น เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา

Items	Interview questions (Effectiveness of technology integration to promote critical thinking skills)
1	How effective is your technology integration for promoting students' critical thinking skills? การบูรณาการเทคโนโลยีของคุณ เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษามีประสิทธิภาพอย่างไร
2	How do you make sure that your technology integration is effective for promoting students' critical thinking skills? คุณแน่ใจได้อย่างไรว่าการบูรณาการเทคโนโลยีของคุณ เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษามีประสิทธิภาพ
3	What technologies should be improved or changed to promote students' critical thinking skills? เทคโนโลยีอะไรบ้างที่ควรได้รับการพัฒนาหรือเปลี่ยนแปลง เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
4	How should those technologies be improved or changed to promote students' critical thinking skills? เทคโนโลยีเหล่านั้นควรได้รับการพัฒนาหรือเปลี่ยนแปลงอย่างไร เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา

Items	Interview questions (Problems with technology integration to promote critical thinking skills)
1	What problems have you faced when integrating technologies to promote students' critical thinking skills? คุณประสบปัญหาอะไรบ้างเมื่อบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
2	Could you please give some examples of those problems when integrating technologies to promote students' critical thinking skills? กรุณายกตัวอย่างของปัญหาเมื่อบูรณาการเทคโนโลยีเหล่านั้น เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
3	How did those problems affect your technology integration to promote students' critical thinking skills? ปัญหาเหล่านั้นส่งผลกระบทต่อการบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษาอย่างไร
4	What caused those problems when integrating technologies to promote students' critical thinking skills? สาเหตุของปัญหาเหล่านั้นคืออะไรเมื่อบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา

Items	Interview questions (Solutions of technology integration to promote critical thinking skills)
1	How did you cope with those problems when integrating technologies to promote students' critical thinking skills? คุณแก้ไขปัญหาเหล่านั้นอย่างไร เมื่อบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
2	Could you please give some examples of how you coped with those problems when integrating technologies to promote students' critical thinking skills? กรุณายกตัวอย่างของวิธีการแก้ไขปัญหาเมื่อบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
3	What kinds of support do you need to solve those problems when integrating technologies to promote students' critical thinking skills? คุณต้องการการสนับสนุนด้านใดบ้างเพื่อแก้ไขปัญหาเหล่านั้นเมื่อบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา

Items	Interview questions (Influential factors of technology integration to promote critical thinking skills)
1	What factors have influenced your technology integration to promote students' critical thinking skills? ปัจจัยด้านใดบ้างที่มีอิทธิพลต่อการบูรณาการเทคโนโลยีของคุณ เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา
2	How have those factors influenced your technology integration to promote students' critical thinking skills? ปัจจัยเหล่านั้นมีอิทธิพลต่อการบูรณาการเทคโนโลยีของคุณ เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษาอย่างไร
3	How have you coped with those factors influencing your technology integration to promote students' critical thinking skills? คุณจัดการปัจจัยเหล่านั้นที่มีผลต่อการบูรณาการเทคโนโลยีของคุณ เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษาอย่างไร

Interview question section C

A group of questions in the interview section C allows EFL university teachers to demonstrate the meaning of their lived experiences and restructure the experiences of promoting students' critical thinking skills with technology integration in English language teaching. Therefore, the purpose of this section is to explore the common meaning of the lived experiences and what they would like to construct new experiences of utilizing technologies in English language teaching to foster students to think critically.

Items	Interview questions
1	How does technology integration to promote students' critical thinking skills benefit you? การบูรณาการเทคโนโลยีเพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษามีประโยชน์กับคุณอย่างไร
2	As an English teacher, what is your expectation of integrating technologies to promote students' critical thinking skills? ในฐานะผู้สอนภาษาอังกฤษ คุณมีความคาดหวังใดบ้างต่อการบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษา

APPENDIX B

AN INTERVIEW GUIDE FOR STUDENTS

An interview guide for Thai EFL university students

Interview question section A

A group of questions in interview section A allows Thai EFL university students to express their background information such as educational background and to describe their experiences of learning English at the university level. Therefore, the purpose of this section is to explore participants' life history and their experiences as English language learners at a university.

Items	Interview questions
1	Could you please introduce yourself and tell me about yourself such as age, gender, major, faculty, and previous and current English courses? กรุณาแนะนำตนเองและเล่าประวัติของตนเอง เช่น อายุ เพศ สาขาวิชา คณะ และรายวิชาภาษาอังกฤษที่เรียนก่อนหน้านี้และปัจจุบัน
2	How has your experience as a student learning English at a university been? ประสบการณ์ในฐานะนักศึกษาที่เรียนภาษาอังกฤษในระดับมหาวิทยาลัยของคุณเป็นอย่างไร
3	In your opinion, how are technologies crucial to your life and English learning? คุณคิดว่าเทคโนโลยีมีความสำคัญกับชีวิตและการเรียนภาษาอังกฤษของคุณอย่างไร
4	In your opinion, how are critical thinking skills crucial to your life and English learning? คุณคิดว่าการคิดอย่างมีวิจารณญาณมีความสำคัญกับชีวิตและการเรียนภาษาอังกฤษของคุณอย่างไร

Interview question section B

A group of questions in interview section B allows Thai EFL university students to provide concrete details of their lived experiences of promoting critical thinking skills with teachers' technology integration in English language learning. The students provide and reflect vivid information regarding types of technology and how teachers have integrated them in the classroom, teachers' effectiveness of technology integration to allow students to think critically, problems and solutions of technology integration, and influential factors of teachers' technology integration. Consequently, the purpose of this section is to gather more details based on the mentioned aspects of students' recent experiences of teachers' technology integration in English language teaching to promote students to think critically.

Items	Interview questions (Types of technology integrated to promote critical thinking skills)
1	What technologies have your English teachers used to promote your critical thinking skills? ผู้สอนภาษาอังกฤษใช้เทคโนโลยีอะไรบ้าง เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ
2	As a student learning English at a university, what technologies do you find beneficial in terms of promoting your critical thinking skills? ในฐานะนักศึกษาที่เรียนภาษาอังกฤษในระดับมหาวิทยาลัย เทคโนโลยีอะไรบ้างที่คุณพบว่ามีประโยชน์ในด้านการส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ

Items	Interview questions (Instructional practices with technology integration to promote critical thinking skills)
1	How did your English teachers use technologies in learning activities to promote your critical thinking skills? ผู้สอนภาษาอังกฤษใช้เทคโนโลยีเหล่านั้นในกิจกรรมการเรียนรู้อย่างไร เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ
2	In your opinion, what technologies did English teachers use to help you to think critically the most? คุณคิดว่าเทคโนโลยีอะไรที่ผู้สอนภาษาอังกฤษใช้เพื่อช่วยให้คุณคิดอย่างมีวิจารณญาณได้มากที่สุด

Items	Interview questions (Effectiveness of technology integration to promote critical thinking skills)
1	In your opinion, is your English teachers' technology integration effective to promote your critical thinking skills? คุณคิดว่าการบูรการเทคโนโลยีของผู้สอนภาษาอังกฤษมีประสิทธิภาพในการส่งเสริมการคิดอย่างมีวิจารณญาณของคุณหรือไม่
2	In your opinion, what technologies that English teacher used should be improved or changed to promote your critical thinking skills? คุณคิดว่าเทคโนโลยีอะไรบ้างที่ผู้สอนภาษาอังกฤษใช้ควรได้รับการพัฒนาหรือเปลี่ยนแปลง เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ

Items	Interview questions (Problems with technology integration to promote critical thinking skills)
1	What problems did you face when your English teachers used technologies to promote your critical thinking skills? ปัญหาอะไรบ้างที่คุณพบเมื่อผู้สอนภาษาอังกฤษใช้เทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ
2	In your opinion, what other problems should English teachers think about when integrating technologies to promote your critical thinking skills? คุณคิดว่าปัญหาอื่นอะไรที่ผู้สอนภาษาอังกฤษควรคำนึงถึงเมื่อบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ

Items	Interview questions (Solutions of technology integration to promote critical thinking skills)
1	How did your English teachers cope with those problems when using technologies to promote your critical thinking skills? ผู้สอนภาษาอังกฤษของคุณแก้ไขปัญหาเหล่านั้นอย่างไร เมื่อบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ
2	In your opinion, what kinds of support do your English teachers need to cope with those problems when using technologies to promote your critical thinking skills? คุณคิดว่าการสนับสนุนด้านใดบ้างที่ผู้สอนภาษาอังกฤษต้องการเพื่อใช้แก้ไขปัญหาเหล่านั้น เมื่อบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ

Items	Interview questions (Influential factors of technology integration to promote critical thinking skills)
1	In your opinion, what factors have influenced the teachers' technology integration to promote your critical thinking skills? คุณคิดว่าปัจจัยอะไรบ้างที่ส่งผลต่อการบูรณาการเทคโนโลยีของผู้สอนภาษาอังกฤษเพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณ
2	In your opinion, how have those factors influenced the teachers' technology integration to promote your critical thinking skills? คุณคิดว่าปัจจัยเหล่านั้นที่ส่งผลต่อการบูรณาการเทคโนโลยีของผู้สอนภาษาอังกฤษ เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของคุณอย่างไร

Interview question section C

A group of questions in interview section C allows Thai EFL university students to construct their meaning of experiences of promoting critical thinking skills through technology integration in the English language classroom. Furthermore, their new structure of recent experiences is provided. Thus, the purpose of this section is to construct participants' meaning of the lived experiences of teachers' utilizing technology in English language teaching to foster critical thinking skills and to generate the restructure of their experiences.

Items	Interview questions
1	How does technology integration to promote critical thinking skills benefit you? การบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณมีประโยชน์กับคุณอย่างไร
2	As a student learning English at a university, what is your expectation of using technologies to promote critical thinking skills? ในฐานะนักศึกษาที่เรียนภาษาอังกฤษในระดับมหาวิทยาลัย คุณมีความคาดหวังใดบ้างต่อการบูรณาการเทคโนโลยี เพื่อส่งเสริมการคิดอย่างมีวิจารณญาณ

APPENDIX C
AN OBSERVATIONAL GUIDE

No. …..

An observational guide for EFL university teachers

The study: An investigation of technology integration to promote Thai EFL university students' critical thinking skills: an exploratory study

Pseudonym: ……...…… **Place:** ……..……...…

Date: ……..…….. **Length of the observation:** ……..…...…

Starting time: ……..…… **Finishing time:** ……..……..

Number of students ……..……

Elements of observation	Descriptions	Descriptive note	Reflective note
Instructional materials and resources	**Instructional materials** • EFL university teachers integrate visual materials that could be software or hardware to allow students to think critically. • EFL university teachers integrate audio materials that could be software		

Elements of observation	Descriptions	Descriptive note	Reflective note
	or hardware to allow students to think critically. • EFL university teachers integrate audiovisual materials that could be software or hardware to allow students to think critically. **Resources** • EFL university teachers employ published resources such as course books and supplementary materials with technological tools that allow students to think critically. • EFL university teachers employ authentic resources with technological tools that allow students to think critically.		

Elements of observation	Descriptions	Descriptive note	Reflective note
	• EFL university teachers provide web resources that allow students to think critically.		
Instructional process	**Instructional methods** • EFL university teachers deliver the content of the lessons and learning activities with technologies that allow students to think critically. **Learning activities** • EFL university teachers assign a variety of learning tasks with technologies such as individual work, pair work, and group work that allow students to think critically.		

Elements of observation	Descriptions	Descriptive note	Reflective note
	Teacher's roles • EFL university teachers clarify the objectives of the lessons with technologies. • EFL university teachers present the content of the lessons with technologies that allow them to think critically. • EFL university teachers ask students questions with technologies that allow them to think critically. • EFL university teachers assign learning tasks with technologies that allow students to think critically. • EFL university teachers provide support for students such as language support and technical support with		

Elements of observation	Descriptions	Descriptive note	Reflective note
	technologies that allow them to think critically. • EFL university teachers assess students' comprehension of the content of the lessons with technologies that allow them to think critically. **Student's roles** • Thai EFL university students participate either passively or actively when learning in a technology-driven environment. **Interaction** <u>Student-student interaction</u> • Thai EFL university students interact passively or actively with their peers		

Elements of observation	Descriptions	Descriptive note	Reflective note
	by using technologies in learning activities. • Thai EFL university students check their peers' understanding of the content of the lesson or assignments with technologies. <u>Teacher-student interaction</u> • EFL university teachers check their students' comprehension of the content of the lessons, learning activities, or assignments with technologies. • EFL university teachers encourage students to think critically and answer questions with technologies.		

Elements of observation	Descriptions	Descriptive note	Reflective note
	• EFL university teachers employ technologies to provide students with feedback.		
Challenges	• EFL university teachers confront self-related problems when utilizing technologies to deliver the content of the lessons, learning activities, or assignments that allow students to think critically. • EFL university teachers confront student-related problems when utilizing technologies to deliver the content of the lessons, learning activities, or assignments that allow students to think critically. • EFL university teachers confront technology-related problems when		

Elements of observation	Descriptions	Descriptive note	Reflective note
	utilizing technologies to deliver the content of the lessons, learning activities, or assignments that allow students to think critically.		
adaptation	• EFL university teachers cope with problems themselves when utilizing technologies to deliver the content of the lessons, learning activities, or assignments that allow students to think critically. • EFL university teachers and students cooperate to cope with problems when utilizing technologies to deliver the content of the lessons, learning activities, or assignments that allow students to think critically.		

APPENDIX D
AN INVITATION LETTERS FOR EXPERTS

ที่ อว 67.26 / พ 113

คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์
เลขที่ 2 ถนนพระจันทร์
แขวงพระบรมมหาราชวัง เขตพระนคร
กรุงเทพฯ 10200

10 มกราคม 2566

เรื่อง ขอเชิญเป็นผู้เชี่ยวชาญตรวจเครื่องมือวิจัย

เรียน ผู้ช่วยศาสตราจารย์ ดร.สุนีตา โฆษิตชัยวัฒน์

ด้วย โครงการปริญญาโทต่อเนื่องเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ) คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ได้พิจารณาแล้วเห็นว่าท่านเป็นผู้ทรงคุณวุฒิ มีความรู้ ความเชี่ยวชาญและประสบการณ์เป็นอย่างดียิ่ง จึงใคร่ขอเรียนเชิญท่านเป็นผู้เชี่ยวชาญตรวจเครื่องมือวิจัยให้แก่ นายสถาพร รุ่งสว่าง เลขทะเบียน 6006320060 นักศึกษาระดับปริญญาเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ) ศึกษาค้นคว้าวิทยานิพนธ์ เรื่อง "การศึกษาการบูรณาการเทคโนโลยีเพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษาชาวไทยที่เรียนภาษาอังกฤษในฐานะภาษาต่างประเทศ: การศึกษาเชิงสำรวจ"

ทั้งนี้ หากท่านประสงค์จะขอข้อมูลเพิ่มเติม สามารถติดต่อ นายสถาพร รุ่งสว่าง ได้ที่ 096 693 5651 หรือ อีเมล sathaphon_not@hotmail.com

จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์ด้วย และขอขอบพระคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.ศุภวัฒน์ พุกเจริญ)
ผู้อำนวยการโครงการปริญญาโทต่อเนื่องเอก
สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ)

สำนักงานโครงการปริญญาโทต่อเนื่องเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ)
โทร 0 2613 2603

ที่ อว 67.26 / พ 114

คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์
เลขที่ 2 ถนนพระจันทร์
แขวงพระบรมมหาราชวัง เขตพระนคร
กรุงเทพฯ 10200

10 มกราคม 2566

เรื่อง ขอเชิญเป็นผู้เชี่ยวชาญตรวจเครื่องมือวิจัย

เรียน ผู้ช่วยศาสตราจารย์ ดร.วชิระ จันทราช

ด้วย โครงการปริญญาโทต่อเนื่องเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ) คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ได้พิจารณาแล้วเห็นว่าท่านเป็นผู้ทรงคุณวุฒิ มีความรู้ ความเชี่ยวชาญและประสบการณ์เป็นอย่างดียิ่ง จึงใคร่ขอเรียนเชิญท่านเป็นผู้เชี่ยวชาญตรวจเครื่องมือวิจัยให้แก่ นายสถาพร รุ่งสว่าง เลขทะเบียน 6006320060 นักศึกษาระดับปริญญาเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ) ศึกษาค้นคว้าวิทยานิพนธ์ เรื่อง "การศึกษาการบูรณาการเทคโนโลยีเพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษาชาวไทยที่เรียนภาษาอังกฤษในฐานะภาษาต่างประเทศ: การศึกษาเชิงสำรวจ"

ทั้งนี้ หากท่านประสงค์จะขอข้อมูลเพิ่มเติม สามารถติดต่อ นายสถาพร รุ่งสว่าง ได้ที่ 096 693 5651 หรือ อีเมล sathaphon_not@hotmail.com

จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์ด้วย และขอขอบพระคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.ศุภวัฒน์ พุกเจริญ)
ผู้อำนวยการโครงการปริญญาโทต่อเนื่องเอก
สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ)

สำนักงานโครงการปริญญาโทต่อเนื่องเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ)
โทร 0 2613 2603

ที่ อว 67.26 / พ 115

คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์
เลขที่ 2 ถนนพระจันทร์
แขวงพระบรมมหาราชวัง เขตพระนคร
กรุงเทพฯ 10200

10 มกราคม 2566

เรื่อง ขอเชิญเป็นผู้เชี่ยวชาญตรวจเครื่องมือวิจัย

เรียน อาจารย์ ดร.มัณฑนา พันธุ์ดี

ด้วย โครงการปริญญาโทต่อเนื่องเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ) คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ได้พิจารณาแล้วเห็นว่าท่านเป็นผู้ทรงคุณวุฒิ มีความรู้ ความเชี่ยวชาญและประสบการณ์เป็นอย่างดียิ่ง จึงใคร่ขอเรียนเชิญท่านเป็นผู้เชี่ยวชาญตรวจเครื่องมือวิจัยให้แก่ นายสถาพร รุ่งสว่าง เลขทะเบียน 6006320060 นักศึกษาระดับปริญญาเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ) ศึกษาค้นคว้าวิทยานิพนธ์ เรื่อง "การศึกษาการบูรณาการเทคโนโลยีเพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษาชาวไทยที่เรียนภาษาอังกฤษในฐานะภาษาต่างประเทศ: การศึกษาเชิงสำรวจ"

ทั้งนี้ หากท่านประสงค์จะขอข้อมูลเพิ่มเติม สามารถติดต่อ นายสถาพร รุ่งสว่าง ได้ที่ 096 693 5651 หรือ อีเมล sathaphon_not@hotmail.com

จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์ด้วย และขอขอบพระคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.ศุภวัฒน์ พุกเจริญ)
ผู้อำนวยการโครงการปริญญาโทต่อเนื่องเอก
สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ)

สำนักงานโครงการปริญญาโทต่อเนื่องเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ)
โทร 0 2613 2603

APPENDIX E
AN ETHIC APPROVAL LETTER

บันทึกข้อความ

ส่วนราชการ สนง.คณะกรรมการจริยธรรมการวิจัยในคน มธ. สาขาสังคมศาสตร์ กองบริหารการวิจัย โทร1804
ที่ อว 67.04.2/(ECSo)028 วันที่ 9 มกราคม 2566
เรื่อง แจ้งผลการพิจารณาของคณะกรรมการจริยธรรมการวิจัยในคน มธ.สาขาสังคมศาสตร์

เรียน นายสถาพร รุ่งสว่าง (คณะศิลปศาสตร์)

ตามที่ ท่านได้เสนอโครงการวิจัยเพื่อขอรับการพิจารณาจริยธรรมการวิจัยในคนจากคณะกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยธรรมศาสตร์ สาขาสังคมศาสตร์ โครงการวิจัยเรื่อง "การศึกษาการบูรณาการเทคโนโลยีเพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของ นักศึกษาชาวไทยที่เรียนภาษาอังกฤษในฐานะภาษาต่างประเทศ: การศึกษาเชิงสำรวจ" รหัสโครงการวิจัยที่ 178/2565 นั้น

บัดนี้ คณะกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยธรรมศาสตร์ สาขาสังคมศาสตร์ ได้พิจารณาอนุมัติด้านจริยธรรมการวิจัยในคน ให้กับโครงการวิจัยดังกล่าวเรียบร้อยแล้ว โดยอนุมัติ ณ วันที่ 29 ธันวาคม 2565 – 29 ธันวาคม 2566 ทั้งนี้ได้แนบเอกสารหนังสือรับรองผลการพิจารณามาพร้อมนี้แล้ว และข้อกำหนดของการดำเนินงานด้านจริยธรรมการวิจัยในคน ผู้วิจัยโปรดส่งรายงานความก้าวหน้าของการดำเนินงานวิจัยนับจากวันที่ได้รับอนุมัติ (ภายในวันที่ 29 ธันวาคม 2566) โดยส่งเอกสาร Electronic File ได้ที่ E-mail: ecsctu2@tu.ac.th

จึงเรียนมาเพื่อโปรดทราบ และโปรดดำเนินการตามข้อกำหนดดังกล่าวด้วย จักขอบคุณยิ่ง

(รองศาสตราจารย์ ดร. อนุสรณ์ อุณโณ)
ประธานคณะกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยธรรมศาสตร์
สาขาสังคมศาสตร์

หนังสือรับรองการพิจารณาด้านจริยธรรมการวิจัยในคน
คณะกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยธรรมศาสตร์ สาขาสังคมศาสตร์
99 หมู่ที่ 18 ถ.พหลโยธิน ต.คลองหนึ่ง อ.คลองหลวง จ.ปทุมธานี 12121
โทร. 0-2564-4440-79 ต่อ 1804, 0-2564-3937

รหัสโครงการวิจัยที่ 178/2565 **หนังสือรับรองเลขที่** 136/2565

ชื่อโครงการวิจัย การศึกษาการบูรณาการเทคโนโลยีเพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษาชาวไทยที่เรียนภาษาอังกฤษในฐานะภาษาต่างประเทศ: การศึกษาเชิงสำรวจ

ชื่อหัวหน้าโครงการวิจัย นายสถาพร รุ่งสว่าง

หน่วยงานที่รับผิดชอบ คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์

ชื่ออาจารย์ที่ปรึกษา รองศาสตราจารย์ ดร.ศุภวัฒน์ พุกเจริญ

หน่วยงานที่รับผิดชอบ คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์

เอกสารที่รับรอง

ลำดับที่	รายการ	เอกสารฉบับที่/วัน/เดือน/ปี
1	โครงการวิจัย	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565
2	แบบประวัติหัวหน้าโครงการวิจัย	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565
3	แบบประวัติอาจารย์ที่ปรึกษา	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565
4	ประกาศนียบัตรการอบรมหลักสูตรจริยธรรมการวิจัยในคน	
5	เอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย สำหรับอาจารย์	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565
6	เอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย สำหรับนักศึกษา	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565
7	หนังสือเชิญชวนเข้าร่วมการวิจัยสำหรับนักศึกษา	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565
8	หนังสือเชิญชวนเข้าร่วมการวิจัยสำหรับอาจารย์	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565
9	คู่มือการสัมภาษณ์สำหรับนักศึกษา	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565

เอกสารที่รับรอง (ต่อ) โครงการที่ 178/2565

ลำดับที่	รายการ	เอกสารฉบับที่/วัน/เดือน/ปี
10	คู่มือการสัมภาษณ์สำหรับอาจารย์	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565
11	คู่มือเชิงสังเกตการณ์สำหรับอาจารย์	ฉบับที่ 1 วันที่ 13 ธันวาคม 2565

คณะกรรมการจริยธรรมการวิจัยในคน มหาวิทยาลัยธรรมศาสตร์ สาขาสังคมศาสตร์ ได้พิจารณาอนุมัติด้านจริยธรรมการทำวิจัยในคนให้ดำเนินการวิจัยข้างต้นได้

ลงชื่อ.....
(รองศาสตราจารย์ ดร. อนุสรณ์ อุณโณ)
ประธานคณะกรรมการ

ลงชื่อ.....
(ผู้ช่วยศาสตราจารย์ อรอุมา เตพละกุล)
กรรมการและเลขานุการ

วันที่รับรอง: วันที่ 29 ธันวาคม 2565 วันหมดอายุการรับรอง: วันที่ 29 ธันวาคม 2566

กำหนดส่งรายงานความก้าวหน้า 29 ธันวาคม 2566

Certificate of Approval
The Human Research Ethics Committee of Thammasat University
Social Sciences
99 Paholyotin Road, Khlong Luang District, Pathum Thani Province. Thailand 12121,
Tel. 662-5644440-79 ext 1804
.....

Certificate of Approval No : 136/2565

Project No : 178/2565

Title of Project: An investigation of technology integration to promote Thai EFL university students' critical thinking skills: an exploratory study

Principal Investigator : Mr. Sathaphon Rungsawang
Study Center : Faculty of Liberal Arts, Thammasat University
2 Prachan Road, Phra Barom Maha Ratchawang, Phra Nakhon,
Bangkok 10200, Thailand

Advisor's name : Associate Professor Dr. Suphawat Pookcharoen
Study Center : Faculty of Liberal Arts, Thammasart University
2 Prachan Road, Phra Barom Maha Ratchawang, Phra Nakhon,
Bangkok 10200, Thailand

Approved Documents

No.	Item	Document No./Day/Month/Year
1	Research Project	Issue 1, 13 December 2022
2	Principal Investigator's Curriculum Vitae Principal	Issue 1, 13 December 2022
3	Advisor profile form	Issue 1, 13 December 2022
4	Certificate in Human Research Ethics Training	
5	Information Sheet (For EFL teachers)	Issue 1, 13 December 2022
6	Information document for research participants for students	Issue 1, 13 December 2022
7	Invitation letter for research for students	Issue 1, 13 December 2022
8	Participant invitation letter for EFL teachers	Issue 1, 13 December 2022
9	An interview guide for Thai EFL university students	Issue 1, 13 December 2022

Approved Documents (Continued) Project code 178/2565

No.	Item	Document No./Day/Month/Year
10	An interview guide for EFL university teachers	Issue 1, 13 December 2022
11	An observational guide for EFL university teachers	Issue 1, 13 December 2022

The Human Research Ethics Committee of Thammasat University Social Sciences has reviewed and approved the above research protocol and documents under expedited review procedures for conducting human research.

Approval period : 1 year
Date of Approval : December 29th, 2022.
Date of Expiry : December 29th, 2023.
Progress report deadline : December 29th, 2023.

Signature : .....

(Assistant Professor Ornuma Teparakul)

Title : Secretary of the Human Research Ethics Committee of Thammasat University Social Sciences

Signature : .....

(Associate Professor Dr.Anusorn Unno)

Title : Secretary of the Human Research Ethics Committee of Thammasat University Social Sciences

APPENDIX F
DATA COLLECTION LETTER

ที่ อว 67.26/ พ 119

คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์
เลขที่ 2 ถนนพระจันทร์
แขวงพระบรมมหาราชวัง เขตพระนคร
กรุงเทพฯ 10200

23 มกราคม 2566

เรื่อง ขออนุญาตเข้าเก็บข้อมูล

เรียน ผู้อำนวยการสถาบันภาษา มหาวิทยาลัยราชภัฏนครปฐม

ด้วย นายสถาพร รุ่งสว่าง เลขทะเบียนนักศึกษา 6006320060 นักศึกษาระดับปริญญาเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ) คณะศิลปศาสตร์ มหาวิทยาลัยธรรมศาสตร์ ศึกษาค้นคว้าวิทยานิพนธ์ เรื่อง “การศึกษาการบูรณาการเทคโนโลยีเพื่อส่งเสริมการคิดอย่างมีวิจารณญาณของนักศึกษาชาวไทยที่เรียนภาษาอังกฤษในฐานะภาษาต่างประเทศ: การศึกษาเชิงสำรวจ” มีความประสงค์ขออนุญาตเข้าเก็บข้อมูล เพื่อประกอบการทำวิทยานิพนธ์ โดยมีรายละเอียดดังนี้

1.ขออนุญาตเก็บข้อมูล อาจารย์ประจำชาวไทยและชาวต่างประเทศ จำนวน 16 คน เก็บข้อมูลด้วยวิธีการสัมภาษณ์และการสังเกตการสอน

2.ขออนุญาตเก็บข้อมูล นักศึกษาชาวไทย จำนวน 16 คน เก็บข้อมูลด้วยวิธีการสัมภาษณ์

ทั้งนี้ หากท่านประสงค์จะขอข้อมูลเพิ่มเติม สามารถติดต่อ นายสถาพร รุ่งสว่าง ได้ที่ 096 693 5651 หรือ อีเมล sathaphon_not@hotmail.com

จึงเรียนมาเพื่อโปรดให้ความอนุเคราะห์ด้วย และขอขอบพระคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.ศุภวัฒน์ พุกเจริญ)
ผู้อำนวยการโครงการปริญญาโทต่อเนื่องเอก
สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ)

โครงการปริญญาโทต่อเนื่องเอก สาขาวิชาภาษาอังกฤษศึกษา (หลักสูตรนานาชาติ) คณะศิลปศาสตร์
โทร 0 2613 2603

BIOGRAPHY

Name Mr. Sathaphon Rungsawang

Address 73/1 Soi Wat Radchasittharam Bangkok yai district, Bangkok 10600

Sathaphon_not@hotmail.com

Educational background

2013 Master degree of Teaching English as a Foreign Language, Faculty of Education, Silpakorn University

2008 Bachelor degree of Business Administration (Business English) with the second honor, Faculty of Business Administration, Rajamangkala University of Technology Phranakhon

Work experience

2014 – present a full-time English teacher, Language institute, Nakhon Pathom Rajabhat University

2009 – 2013 a part-time English teacher, Faculty of Education, Silpakorn University