Students' and Teachers' Perceptions and Needs Towards Technology Integration in English Classrooms

SUPHINYA PANYASI[1*]
THEERASAK SOYKEEREE[1]
DAWUTCHA TAENGSOPA[2]
WICHITTRA CHANSRIBUT[2]

[1]*Faculty of Education and Development Sciences, Kasetsart University, Thailand*
[2]*Kasetsart University Laboratory School Kamphaeng Saen Campus Educational Research and Development Center, Kasetsart University, Thailand*

***Corresponding author email: suphinya.pa@ku.th**

Article information

Article history:
Received: 5 Mar 2024
Accepted: 1 May 2025
Available online: 14 May 2025

Keywords:
Technology integration
Professional development
Teachers' perceptions and needs
Students' perceptions and needs

Abstract

The Fourth Industrial Revolution and the COVID-19 pandemic have substantially challenged teaching strategies. During COVID-19 lockdowns, many teachers had to produce digital-based English learning media using platforms such as Google Classroom. This integration of technology and teaching materials was directly aimed at facilitating and enhancing English language teaching. However, it has been noted that some teachers do not fully exploit the potential of available technologies in their classrooms. This study explored 73 secondary school students' and 10 secondary school English language teachers' perceptions and needs of technology integration during and after the COVID-19 pandemic. Data were collected through a questionnaire and a semi-structured interview with each respondent to gather details on perceptions and needs. The analysis revealed three main elements that could lead to the success of technology integration in English classrooms: more technology-oriented professional development, suitable classroom allocation, and a value-oriented incentive. New findings highlighted in this study included a discrepancy between students' and teachers' perceptions of the preferred learning and teaching environment and the technological support required by students.

INTRODUCTION

During the Fourth Industrial Revolution, electronic products with Internet capabilities have become more prevalent, changing all facets of modern life. The Internet offers great promise for application in education, including access to a wide range of knowledge. As a result, personal computers, laptops and smartphones are being used for e-learning, computer-based tests, blended learning and smartphone-based examinations. Based on Thailand's most recent household survey on the use of information and communication technology (2024 quarter 4) (National Statistical Office, 2025), the survey results of people aged 6 years and over,

approximately 66.1 million people, revealed that there were 60.0 million Internet users (90.9%), 63.2 million mobile phone users (95.7%), and 58.8 million mobile phone owners (89%). The number of smartphone owners tends to increase from 96.2% in 2023 (Q4) to 97% in 2024 (Q4). People aged 15-24 years use the Internet (99.2%) and use mobile phones (99.3%) more than in other age groups. This positions Thailand as a developing country with a large number of Internet users, making it an ideal place for disseminating information through smartphones and the Internet. Additionally, a study on the social media usage behaviour of 400 Generation Z (aged 16-24 years) in Bangkok also found that Gen Z uses social media as an important part of their daily lives, especially Facebook, YouTube, and Instagram, which have the highest usage rates. Usage behaviour focuses on communication, news following, and learning through digital platforms, with future trends showing that Gen Z will rely more on digital technology in every aspect of their lives (Senawong, 2021). Students, as digital citizens, should be comfortable with utilising digital technology in their learning materials.

The integration of technology and teaching materials has been promoted by scholars, such as Megawati et al. (2021), who suggested that the involvement of technology is critical in creating a supportive learning environment. Utecht and Keller (2019) shared a similar belief that digital-based learning media could facilitate English learning by allowing for interaction and sharing. The study by Georgina and Hosford (2009) revealed a strong relationship between pedagogical practice integration and technological literacy. Thus, there is an urgent need to develop teachers' competency in digital literacy and remote teaching skills. The COVID-19 pandemic has accelerated the awareness and adoption of classroom technology, leading to significant long-term changes in the educational landscape. As schools transitioned to remote learning, both teachers and students recognised the importance of digital tools for effective communication and learning. There was an increased reliance on digital tools and platforms, such as video conferencing and online learning management systems. This shift encouraged teachers to explore innovative teaching methods. For example, English language teachers in Thailand produced digital-based English learning media using application integration platforms, such as Google Classroom, Microsoft Teams and Moodle, as well as available social media, such as Facebook and Line. The results of digital integration have shown that there was effective use of digital-based learning media with learning outcomes obtained by students and that the developed media was suitable for independent learning (Rahayu & Ulumiyah, 2021). Due to the proliferation of online digital media, it can be very challenging to integrate all the applications and ensure they work together seamlessly. Therefore, a digital classroom management system, such as Google Classroom, might be used effectively to integrate teaching and learning applications in one place. Sholah (2020) praised the organisation and flexibility of technology in efficient classroom management, where teachers can assign work, access the students' responses and provide feedback directly at any time and in any place.

Despite the advanced technology and modern teaching materials, some teachers are still strictly relying on teacher-centred technology such as using PowerPoint slides and videos for presentations which likely leaves students disengaged and may hinder the teaching-learning goals of effective communication. Examples from classroom observations of three English as a Second Language (ESL) teachers in the U.S. discovered that although the teachers frequently utilised digital boards to show journal prompts, they did not encourage the students to engage

with the boards (Andrei, 2017). Similarly, Li et al. (2019) examined the impact of technology use on teacher-student interaction patterns in classrooms of three teachers with high and three with low technology use. Based on conversation analysis of classroom videos, they concluded that when digital tools were not oriented towards student-centredness, teachers were less likely to provide their students with meaningful communicative language learning experiences. This study demonstrated the widespread use of teacher-centred technology in English as a Foreign Language (EFL) classrooms and the pressing need to address ways to improve EFL instructors' pedagogical understanding and proficiency in technology-assisted language education.

Kenan Foundation Asia (Kenan Foundation Asia, 2023) highlighted issues regarding ineffective teaching practices and poor teacher support in using digital technology and educational platforms during COVID-19. Teachers have been negatively impacted by the shift from in-class teaching to digital platforms due to their unpreparedness and lack of digital devices and literacy skills. There was inadequate teacher training on using technology for remote teaching and poor teacher support. Additionally, there was a lack of guidance and direction on school policy and practices during COVID-19, resulting in confusion, stress and a greater workload burden. The World Bank (2021) recommended that all teachers need training in digital skills and support to deliver remote instruction to manage this demanding task. This was supported by Intharawiset et al. (2021), who argued that teachers should learn from the past problems during COVID-19 and be ready to adapt to the changing world and be able to manage learning within New Normal situations. Thus, there is an urgent need to enhance EFL instructors' understanding and proficiency in integrating pedagogical practice and technological literacy.

LITERATURE REVIEW

Technology integration

The advance of computer technology and Internet connections at the start of the third millennium has increased interest in e-learning implementation. Through the Internet, individuals may now access course materials from anywhere. The use of e-learning may promote and enhance student engagement in the classroom. E-learning focuses on the application of technology to learning and teaching (Agarwal & Pandey, 2012). It describes the application of electronic media and information and communication technologies to the learning process. Currently, there are two categories of online learning: synchronous and asynchronous. Asynchronous learning can take place while teachers and students are offline (Arisandhy, 2010); however, synchronous learning entails online communication and video conferences. Both have advantages and disadvantages. Depending on how the students acquire knowledge, different techniques may be most suitable for different students.

National Cooperative Education Statistics System (n.d.) has defined technology integration as the deployment of digital resources and technology-based practices in daily tasks, work and school administration. Examples of technology resources include computers and specialised software, network-based communication systems, as well as other hardware and infrastructure.

Examples of practices include collaborative work and communication, Internet-based research, remote instrument access, network-based data transfer and retrieval, and other techniques. Successful integration must be regular, smooth, and both efficient and effective in advancing school objectives and purposes. They suggested patterns of teacher use or the percentage of teachers using computer-based technologies for a variety of instructional and instruction-related tasks as indicators of technology integration in classrooms.

Digital technology integration has also been examined by Mishra and Koehler (2006) from the perspective of a single instructor. They considered the knowledge that instructors need to successfully integrate digital technology into their classroom practices. Mishra and Koehler (2006) suggested that instructors should think about the interactions among three different types of knowledge—technological knowledge, pedagogical knowledge and subject knowledge. Additionally, they contended that a teacher's integration of these three types of knowledge, also known as TPACK (technological, pedagogical, and content knowledge), results in the most efficient use of digital technology in a classroom. Each of the three overlapping circles that made up Mishra and Koehler's TPACK framework represented a component of teachers' professional knowledge. However, Mishra and Koehler noted that measuring teachers' professional knowledge may not be adequate to indicate successful integration of digital technology in classes because sociocultural factors may affect how well instructors integrate digital technologies in their contexts.

Stanley (2013) encouraged the integration of technology into the language curriculum and emphasised that technology should be used "to promote and extend learning" by adopting a blended-learning approach using learning management systems (LMS). Several LMSs have been introduced to help teachers easily integrate multiple digital technologies in their classrooms. This LMS software provides a virtual classroom for students, with features such as student materials and assignment distribution, student assignment collection and progress reports. Examples of classroom management systems include Google Classroom, Microsoft Team, Moodle and ClassDojo. Google Classroom is one of the most popular classroom management systems in Thailand because it is free and easily accessible with a Gmail account, making it a useful tool for teachers and students during the COVID-19 lockdowns. Comprehensive use of Google Classroom is supplemented with Google-provided applications such as Google Drive and Google Meet, allowing users to work collaboratively despite being spread among distant locations.

Social cognitive theory

Social cognitive theory (Bandura, 2005) emphasises the role of cognitive and behavioural elements in influencing individuals' perceptions, attitudes, and behaviours. This theory was chosen as the fundamental theoretical framework for the investigation because it suggests that teachers' perceptions of teaching and learning are shaped by their prior experiences, knowledge, and beliefs and that learning is closely linked to observing others and their environment, which influences learners' perceptions of their own abilities. The term 'social cognitive' in this study referred to personal beliefs and behaviours shaped by one's own experiences and by observing the actions of others that can influence their own actions and

outcomes. The term 'perceptions' used in this study referred to the idea, the belief or image that teachers and students have that is shaped by their background knowledge and life experiences. The term 'needs' in this study referred to essential elements that will allow teachers and students to put their perceptions into actual behaviours. According to the research, educational beliefs are essential for comprehending the various ways that teachers integrate digital technology into their teaching. According to Ertmer et al.'s (2012) study, pedagogical beliefs and pedagogical practices aligned. The study involved 12 US technology award-winning teachers and involved document analyses of the participants' websites and individual interviews. Their findings suggested that external obstacles such as the availability of technology tools could not be sufficient to prevent instructors from using a student-focused approach in the classroom if their underlying views aligned more closely with constructivism. This emphasises the importance of teachers' views in the adoption of digital technologies and opens up the possibility of more empirical research on whether and how pedagogical beliefs may transcend external barriers, as well as the conditions under which they could do so. When Lai et al. (2016) conducted interviews with university students and teachers regarding the use of technology for language learning, they discovered a discrepancy in the perceptions of the two groups: the students expected greater support from their teachers, while the teachers were worried about their own limitations in terms of support. Teachers' perceptions towards educational technology have a significant influence on how they teach, and as a result, students' responses to technology use may impact how teachers utilise it in the classroom.

Students' perceptions and needs

Recent research has provided quite positive learners' feedback on digital learning using Google Classroom. For example, Prawiro and Ningrum (2021) reported undergraduate students' perceptions of using Google Classroom in English language teaching (ELT) as positive. Students highlighted the advantages of the Google Classroom application as keeping a record of learning material and assignments, providing quick access to collect assignments, and minimising the cost of learning. However, they also noted some negative impacts of technology integration caused by slow Internet connection speeds and poor screen displays. Intharawiset et al. (2021) reported similar feedback for EFL participants, who stated that Google Classroom was easy to use and highlighted the benefits of real-time feedback and communication from the teacher for sending announcements and starting class discussions immediately. Aung and San (2021) surveyed 128 Thai and non-Thai students for their opinions regarding the use of Google Classroom. The respondents indicated it was useful and easy for the students regardless of their demographics. However, the results from the open-ended questions revealed that some respondents had technical anxiety, suggesting that teachers should pay attention to possible technical difficulties while using Google Classroom. Similar results were reported from the study by Nugroho and Atmojo (2022), which surveyed 71 EFL learners and conducted a group discussion on learners' perceptions towards digital learning. Students participating in the research positively perceived the use of digital technology as a means of language learning through available social networking sites, such as YouTube, WhatsApp, Instagram, Google Classroom and Facebook.

An empirical study by Chhoeut et al. (2023) showed that when TikTok was included in classroom communicative exercises for 31 Grade 10 students in Cambodia, students' speaking scores improved after 12-week lessons based on the dependent samples *t*-test of the pre- and post-speaking tests ($p < .01$). Students' opinions on the questionnaire indicated that they thought using TikTok in conjunction with communicative activities was helpful for speaking practice (48%), confidence building (23%), enjoyment (16%), and creative thinking (6%) while the rest of the students thought the task was normal (6%). Students reflected that it was challenging to create a speaking video on TikTok and felt neutral about role-play and speaking reflection tasks on TikTok. Based on teachers' observations, student participation also increased as a result of technology being incorporated into the classroom. Students could post their completed TikTok films in the classroom Facebook group. By sharing information, they inspired and encouraged their peers to produce better versions of the tasks.

From the literature, it is clear that students had positive perceptions toward using digital technology in and beyond the classroom during and after the COVID-19 pandemic, despite issues with technical difficulties and anxiety. Nevertheless, there is no clear guidance from the literature regarding students' learning preferences or assistance required to better facilitate the use of digital technology in school.

Teachers' perceptions and needs

Previous research suggested that teachers' perceptions are essential in technology integration in language classrooms because pedagogical beliefs play a critical role in understanding the different ways in which teachers integrate digital technologies. While the students had positive perceptions towards digital technology integration in the classroom, early research by Azhar and Iqbal (2018) found that teachers perceived it as only facilitating document management and basic classroom management, and they did not perceive its usefulness in terms of having a significant impact on teaching methodologies. On the other hand, Fitri and Putro (2021) conducted an online questionnaire with 126 primary and secondary EFL teachers, and the results indicated that the majority of these teachers believed that integrating information and communication technology (ICT) was effective. However, they identified challenges that discouraged some of them from using ICT, such as a lack of Internet access, little technical support from the school and limited personal knowledge and training in ICT.

A recent review to explore teachers' perceptions of technology integration in teaching-learning practices (Akram et al., 2022) reported that the teachers in that study had favourable opinions regarding the use of technology in education and learning. They felt that using technology in the classroom helped them improve their instructional strategies, encourage learning engagement and activity and maintain student motivation. However, some primary barriers have been identified that prevent teachers from successfully integrating ICT into their teaching practices. These included slow Internet speed and a lack of infrastructure, as well as limited remote teaching experience and training. As a result, the study recommended that the relevant authorities establish precise and practical guidelines for the effective use of ICT by allocating an adequate budget and providing all the necessary infrastructure in all educational institutions. Careful consideration should be given to the provision of sufficient opportunities for teachers'

career development in acquiring technological skills, which would aid them in effectively utilising ICT in their instructional practices.

Garib (2023) conducted an empirical study to explore English teachers' perceptions of technology before and after implementation in under-resourced contexts in Lebanon, Libya and Syria. The findings from survey and interview data from 25 English teachers showed a number of difficulties they had when trying, such as limitations of infrastructure including power outages, challenges in introducing technology to students, and uncertainty in assessing the lessons. Nevertheless, all of the teachers in the three contexts believe that technology-assisted project-based language learning is a desirable teaching strategy to put into practice. However, the teachers' initial concerns with introducing and assessing the technology remained even after the implementation, suggesting the need for professional training and instructional support.

In Thailand, Tiangtrong (2021) conducted a survey on the use of digital technology for learning management among 302 primary teachers in Sukhothai province, which found a high level of digital technology use in teaching; however, there were weaknesses in using technology for evaluation. It was suggested that professional development was needed so that digital technology could fully support student learning. This could include teacher training, digital tool development, promoting effective technology use, and developing appropriate assessment processes.

From the literature, teachers' perceptions are crucial for integrating technology in language classrooms. Teachers generally had positive opinions on using technology to improve teaching strategies and student engagement. While most teachers believe in the effectiveness of integrating ICT, some teachers only view technology as helpful for document management, not teaching methodologies. Challenges such as limited knowledge and support hinder the usage of ICT. Professional training and instructional support are identified as crucial needs for successful technology integration.

Significance of the study

Multiple studies that explored teachers' and students' perceptions of integrating technology in English language classrooms highlighted positive perceptions but challenges like lack of training and technical support such as slow Internet connection speed and quality of devices hindering the effective use of digital technologies in teaching and learning. However, there is an absence of research regarding students' and teachers' perceptions and needs of technology integration in English classrooms in the context where adequate teaching and learning technology is available. It is also essential to identify if students' and teachers' perceptions and needs toward technology integration in classrooms are compatible because these perceptions and needs may either encourage or discourage students and teachers from integrating technology in their learning and teaching. This study aimed to study Grade 10 students' and teachers' perceptions and needs towards technology integration at the school and to compare students' perceptions and needs with teachers' perceptions and needs.

The research questions:

1. What are students' perceptions and needs towards technology integration during and after COVID-19 that will enable successful integration of technology in English language teaching and learning?
2. What are teachers' perceptions and needs towards technology integration during and after COVID-19 that will enable successful integration of technology in English language teaching and learning?

METHODOLOGY

Context of the study

The School has 11 Thai teachers and 8 foreign teachers in the Foreign Language Department managing English language teaching and learning from kindergarten to high school levels. The School focuses on providing educational support for students to develop knowledge and skills for academic excellence along with desirable personalities. Emphasis is placed on learning process skills and autonomous learning. The School has a policy of supporting the use of technology in day-to-day classroom teaching and learning. Before the pandemic, necessary equipment and technology were provided to facilitate teaching and learning, such as the installation of Wi-Fi in all areas of the School, a computer lab with an Internet network system for students to use and an interactive whiteboard in every classroom. When the pandemic forced the School to implement a remote teaching model, the School provided training sessions for teachers to enhance their digital literacy and teaching efficiency, such as training on using Zoom and Google Meet in organising meetings and online teaching, as well as training on the use of Google Classroom in online teaching management. These supports were aimed at enabling teachers in the Foreign Language Department to use technology in teaching and learning and to ensure that the students got the most out of it as well. Nevertheless, it was noted that some teachers did not fully utilise the technology available; thus, there is a need for targeted teacher training and development to meet the needs of the teachers, as well as to effectively allocate the limited resources of the school. A question has been raised regarding what the teachers believe about technology integration in the classroom. Hence, it is necessary to conduct research on teachers' perceptions and needs of technology integration in English classrooms. The information obtained could be well used to plan future professional development training for faculty staff to enable them to be ready for future changes.

Research design

This study adopted a convergent mixed-method design (Creswell & Clark, 2018) to concurrently collect quantitative and qualitative data from the participants. The questionnaires were administered to obtain general perceptions and needs of students and teachers regarding technology integration in English language classrooms while the semi-structured interviews were conducted to obtain a deeper understanding of students' and teachers' experiences, perceptions and practices. The limitation of the questionnaire in which respondents opted not

to answer the open-ended questions/options was complemented by interviews in the mixed-method design. These data sets were analysed separately, with both quantitative data and qualitative data carrying equal weight when the results were merged during the interpretation of the data. This design was selected in order to obtain a better understanding of the research questions and to validate one set of findings with the other from different types of data.

Participants

This mixed-method study used a survey of secondary school English language students (N = 73) and teachers (N = 10) and interviews of students (N = 7) and teachers (N = 3) to explore secondary students' and ELT teachers' perceptions and needs of technology integration during and after the COVID-19 pandemic.

The population of the study was 160 Grade 10 students and 19 English language teachers in semester 2 of the academic year 2022. The sample group (Table 1) consisted of 73 student respondents, of whom seven voluntarily provided an interview, and 10 teacher respondents, of whom three voluntarily provided an interview. Of the student respondents, 38 were female (52.1%) and 35 were male (47.9%); all were Thai (100%). Of the teacher respondents, seven were female (70%) and 3 were male (30%); 3 were Thai (30%) and 6 were non-Thai (70%); 6 (60%) graduated with bachelor's degrees, 3 (30%) graduated with master's degrees and 1 (10%) graduated with a doctorate degree; 5 (50%) aged between 21-30 years old, 1 (10%) aged between 31-40 years old, two were aged between 41-50 years old (20%) and between 51-60 years old (20%). Three teachers (30%) participating in this study had between 1-3 years of teaching experience, and 2 teachers each had 4-6 years (20%), 7-9 years (20%) and more than 10 years (20%) of teaching experience; 4 teachers (40%) currently teach Year 1-3, 3 teachers each teach Year 4-6 (30%), Year 7-9 (30%) and Year 10-12 (30%).

Table 1

Demographic information of participants in the research project (N = 83)

Respondents	Recruited	Respond	Sex		Response Rate
			Female	Male	
Students	82	73	38	35	89.02%
Teachers	17	10	7	3	58.82%

In terms of device ownership and access to the Internet, the majority of students (93.2%) identified themselves as competent in using digital technology in learning. Table 3 showed the device ownership and Internet access of students, with each student owning at least two devices such as a desktop computer (39.7%), a laptop computer (42.5%), a tablet (71.23%) and/or a smartphone (95.9%). They accessed the Internet through mobile data (35.62%) Wi-Fi (32.87%) with 31.51% of students able to get access to both mobile data and Wi-Fi. The majority of teachers (90%) identified themselves as competent in using basic digital technology. Each teacher owned at least two devices such as a desktop computer (39.7%), a laptop computer (42.5%), a tablet (71.23%) and/or a smartphone (95.9%).

Data collection

After securing ethical approval and approval to conduct the research at the School, data collection was conducted using an online survey questionnaire and group interviews of volunteer informants. Data collection procedures were generally carried out within the framework of the classroom timetable and took place in the students' classes, teachers' offices, and a meeting room.

Student-based data were gathered by an author who was not working for the School. Thai was used in the questionnaire and interview to ensure that respondents clearly understood the instructions and questions. In selecting the classrooms for this project, convenience sampling was used to identify the classrooms for data collection due to the availability of English classes during the data collection period. Grade 10 students were selected based on the maturity of the respondents, in that they were able to reflect and articulate their ideas and the timing that was least likely to disrupt students' learning. The research purposes were explained to the students. It was also explained that participation was voluntary, would not affect their scores or grades, and their names would remain anonymous. Seventy-three students from the sample group of 82 students voluntarily participated in this study. They spent approximately five minutes completing the questionnaire (89.02% response rate). Seven students also agreed to participate in a 45-minute face-to-face group interview. The interview was audio recorded.

Teacher-based data were gathered by a researcher who was a colleague working at the school. The researcher individually invited the teachers to participate. The teachers were informed of the purpose of the study and asked to complete a hardcopy questionnaire. They were also told that their names would not be collected. The respondents were given a week to fill out and return the questionnaire on a research desk. Ten out of 17 teachers returned their questionnaires on time. In addition, three teachers agreed to participate in 8-10 minute face-to-face individual interviews. The interview was audio recorded.

From the literature review, the researcher identified questions and question types for the student and teacher groups. Due to the need to limit the length of the instrument, it was decided to exclude popular well-established perceptions, such as that integrating technology in the classroom is interesting and useful, from the surveys, and instead focus on effectiveness and preferences. Accordingly, nine items were developed for the student survey, and 17 for the teacher survey. The teacher survey and the student survey each consisted of two parts. The first part was a semi-open-ended questionnaire where respondents could choose multiple options from available choices that closely reflected their situations or opinions, as well as being able to provide additional information. The second part contained demographic information. Interview questions were also developed to supplement and triangulate the data from the questionnaires. The interview questions for students and teachers were similar. They included topics regarding teaching/learning experiences, availability of technology and facilities required, success factors, and teachers' and students' readiness. The drafts of surveys and interview questions were checked for faults, ambiguities and face validity by a group of academics with expertise in educational research. The overall index of item objective congruence of the student questionnaire was 1.0, of the teacher questionnaire was 0.95, of the student interview

questions was 1.0 and of the teacher interview questions was 1.0. The interview questions are listed in Appendix 1 and Appendix 2.

Data analysis

Data analysis of questionnaires was based on the means and percentages of categories of situations and opinions. The results of the average were evaluated based on the following criteria (Pimentel, 2019):

Very Low:	1:00–1.79
Low:	1.80–2.59
Medium:	2.60–3.39
High:	3.40–4.19
Very High:	4.20–5.00

The data analysis of the interview questions was based on a content analysis approach. After the data collection, the interview data was transcribed verbatim, and each participant was assigned a number by one of the researchers. The transcriptions were then analysed and categorised using a content analysis approach, which allowed the researchers to systematically identify the major themes emerging from the data reduction, data display, and conclusion drawing process (Miles & Huberman, 1994). The process of coding for the content analysis used in this project followed the process outlined in Creswell (2012). The process began with open coding, where data segments were matched to codes that describe the meaning of the data. Each segment of text was coded under two code groups to identify their potential to contribute to answering the research questions. Labels were created and examined for the emerging concepts that were identified. The first group was the emerging topic being discussed in that segment, such as Google Classroom, teacher, and so on. Most of the topics were predictable because they were guided by the question prompts, while some topics were spontaneously mentioned by the interviewees. The second group was the general tone of the opinions expressed in that segment, which was coded as positive, negative, or neutral. After the first question was coded, the generated codes were reviewed by the research team, revised, and reduced by grouping similar codes before they were used to code the rest of the questions. The emerging codes and themes were cross-checked between the groups of students and teachers to verify any similarities and differences.

RESULTS

Students' perceptions and needs

During COVID-19, students experienced various educational technology in the classroom (Table 2). Most respondents used Line Group (91.8%) and Google Classroom (65.8%) to communicate with their teachers, followed by Messenger (56.2%), Facebook Group (30.1%) and E-mail (30.1%). Most of the students used different teaching and learning platforms to participate in online lessons such as Google Meet (95.9%), Google Classroom (86.3%) and

Zoom (84.9%). Most of the students used applications such as Quizizz (91.8%), Google Form (87.7%) and Kahoot (87.7%) in their studies and revision. The majority of students also relied on materials from websites such as Google (95.9%) and YouTube (91.8%) to supplement their learning. After COVID-19, Google Classroom was the preferred LMS, particularly for homework submission.

Table 2

Percentage of students experienced with technology integration during COVID-19

Communication Tools				Applications				Websites			LMS	
LINE Group	Facebook Group	MSG	Google Classroom	Email	Kahoot!	Quizizz	Google Form	You Tube	Google	Google Meet	Google Classroom	Zoom
91.8	30.1	56.2	65.8	30.1	87.7	91.8	87.7	91.8	95.9	95.9	86.3	84.9

> "It's more convenient to send homework in Google Classroom. Sometimes the teacher is not in the office when we submit the work." (Student 3)

> "Some work we saved on the computer doesn't get lost. We can always send it back. There is always evidence." (Student 5)

Table 3

Percentage of students' perception about technology integration

Effectiveness of a self-study lesson using application integration	**Per cent**
Effective	43.8
Just so-so	54.8
Ineffective	1.4
Type of learning environment preferred	
One with no online components	35.6
One with some online components	16.4
About half online and half face-to-face	11.0
One that is mostly but not completely online	4.1
One that is completely online	11.0
No preference	21.9
Types of learning materials that can attract students' interest in learning	
Mobile application	63.0
Online learning websites	27.4
PowerPoint	49.3
Textbooks	6.8

As for students' perception about technology integration (Table 3), 43.8% of the respondents believed a lesson using application integration to be effective for students to learn language; however, 54.8% believed those lessons were just so-so. Nevertheless, the type of learning environment preferred by 35.6% of the respondents was one with no online components, while only 16.4% of respondents preferred one with some online components, and 21.9% showed no preference. Additionally, 11% each preferred either one that was about half online and half face-to-face or one that was completely online. The analysis of interview data revealed the preferences for some offline materials and assignments due to the limitation of device memory capacity.

> "I'd like to have some offline assignment during classes because if there's a lot of online assignment, the device's memory will be full and I don't dare to delete it." (Student 4)

> "I didn't keep the assignment because my memory was full and I deleted it when I finished." (Student 6)

> "I want to study on-site but the work storage system is online because it is better to store work in an organised manner." (Student 7)

63% of the students showed preferences for learning material using mobile application, followed by PowerPoint (49.3%), and online learning websites (27.4%). Only 6.8% of the students preferred textbooks. The analysis of interview data confirmed the results of the questionnaire, with students strongly preferring YouTube and competitive games as learning materials.

> "It helps me remember better when playing games. It makes me remember the exam better. For example, if I make a mistake on this question, I will remember it." (Student 2)

> "Technology makes the teaching media more interesting. Studying is more fun or you have more concentration in studying. It's not boring." (Student 7)

> "I would like to have worksheets so that we can practise writing." (Student 4)

As for technology supports and needs, most of the respondents (89%) searched Google, YouTube or another online source when they needed technology support or assistance for school activities, or asked their friends, while the others tried to figure it out on their own. Asking teachers was the least preferred way to seek help (28.8%). The interview data revealed students' additional needs for quiet learning environment and accessories for the school computer rooms such as headphones and charging hubs. The students also stated preferences that technology in class should be simple and easy to use for both teachers and students. They also highlighted the need for interesting, readable digital learning materials.

> "Some teachers teach very well on-site, but when teaching online, their teaching materials are not interesting and not memorable." (Student 4)

> "The media and slides should not look long. The teacher should summarise for students to make it interesting to read because some teachers take everything from the Internet. We have to read and summarise again." (Student 7)

Teachers' perceptions and needs

The results of the survey indicated that the deployment of technology by all teachers to enhance lesson objectives occurred through various activities both in- and outside-class. These activities served different purposes, including instructional, communicative, organisational, analytical, recreational and evaluative. The results of how teachers used technology are presented in Table 4.

Table 4

The deployment of technology integration

	Mean	Standard Deviation	Frequency
Instructional (teaching, drill)	4.0	1.05	High
Communicative (e-mail, Line)	4.0	0.67	High
Organisational (roll, distributing materials)	3.5	0.97	High
Analytical (graph, statistical analysis)	2.8	0.92	Medium
Recreational (instructional game)	3.5	1.18	High
Evaluative (assignment, assessment devices)	3.6	0.84	High

As shown in Table 4, teachers participating in the survey frequently used technology for instructional ($\bar{x}$ = 4.0, S.D. = 1.05) and communicative ($\bar{x}$ = 4.0, S.D. = 0.67) activities. However, use in an analytical activity was less frequent ($\bar{x}$ = 2.8, S.D. = 0.92).

Table 5

Percentage of teachers' perceptions about technology integration (N = 10)

Self-assessed competency in applying technology in teaching	
Not competent	30
Competent	70
Very competent	
Levels of students' competency to use basic software and applications (e.g., MS Office, Google Apps, etc.).	
Not competent	
Competent	70
Very competent	30
Effectiveness of a self-study lesson using application integration	
Effective	50
Just so-so	50
Ineffective	
Plan to integrate online classroom lesson with traditional classroom lesson after COVID-19	
Yes	80
No	0
Maybe	20
Type of learning environment preferred to teach	
One with no online components	10
One with some online components	70
About half online and half face-to-face	10
One that is mostly but not completely online	10
One that is completely online	0
No preference	0
Types of learning materials that can attract students' interest in learning	
Mobile application	10
Online learning websites	30
PowerPoint	40
Textbooks	20
When I require technology supports for work-related activities, I...	
Ask my friends.	20
Ask my family.	20
Ask my colleagues.	80
Ask my students.	30
Search Google, YouTube or another online source.	80
Contact the vendor.	0
Figure it out on my own.	40

Types of supports required to motivate teachers to effectively integrate more technology into their traditional classroom	
More/better technology-oriented professional development opportunities.	50
A monetary or other value-oriented incentive.	30
Professional advancement considerations.	50
Release time to design/redesign my courses.	10
Direct assistance from an instructional design expert to design/redesign my courses.	0
Direct assistance from IT staff to support the technology I choose to implement.	0
Assigning me a classroom that matches my educational technology needs.	30
Working in a group that is adopting the same types of practices.	10
A better understanding of the types of technologies that are relevant to teaching and learning.	0
A better understanding of how to use student-owned technology during class for teaching and learning.	0
Confidence that the technology will work the way I plan.	0
Increased student expectations of technology integration.	0
Increased institutional expectations of technology integration.	0
Clear indication/evidence that students would benefit.	30

One of the most encouraging findings from the survey as shown in Table 5 was that 70% of the respondents identified themselves as competent and very ready for integrating technology in the classroom.

> "I joined a lot of seminars about the medium of instruction which is technological and technology and also blended application. I can say that I am well ready to teach using the application integration." (Female, 10 years as a teacher)

However, 30% of the respondents felt inadequate in applying technology in teaching.

> "I cannot say that I am fully ready. I use applications in my teaching, but I really want to know more because we need to have diverse learning styles and also diverse kinds of applications for use in our teaching. When the teacher is not well equipped in using the application, it is also one of the challenges that we can face." (Female, 3 years as a teacher)

Of the respondents, 30% believed their students were very competent in the use of basic software programmes, while 70% believed their students were competent. When respondents needed technology support for work-related activities, 80% asked colleagues or searched using Google, YouTube or another online source, followed by 40% who figured it out on their own. However, 30% asked their students and 20% asked their friends/family.

> "With some applications that you want to apply for the students, maybe the students are already …ahead of you. So that you will not be embarrassed in front of them, you must first equip yourself with these technological facilities in such a way that the learning situation will go smoothly and at the same time; if the student already knows it, then it will be a smooth learning process." (Male, 5 years as a teacher)

Overall, the teachers perceived that they were receiving adequate technological support from the school. “The administrator’s support is good. We already have a smart TV which we can use as well and nice Internet.” (Female, 10 years as a teacher) Nevertheless, there were challenges in integrating technology in the class, such as a stable Internet connection for students and identifying applications suitable for every student's mobile phone;

> “Not all applications are suitable for every mobile phone. For example, not all of Kahoot! was accepted or could be downloaded by all cell phones. So, that is also the challenge.” (Female, 10 years as a teacher)

Teachers in the study reported mixed feelings regarding the effectiveness of application integration on language learning, with one-half believing it to be effective and the other half thinking it was average. Nevertheless, all the interviewed teachers highlighted the benefits of using technology in classrooms, such as student enjoyment and active participation.

> “Students are more active in learning through this application that is presented to them and are eager to learn more when the technology is there....cooperative learning is increased through this application.” (Male, 5 years as a teacher)

One of the most striking findings from this survey was the aspect regarding the preferred teaching environment, with 80% of the teachers planning to integrate online classroom lessons with traditional classroom lessons in the future, although another 20% were still unsure. None of the teachers expressed a desire to teach completely online; however, 70% preferred an environment with some online components, while 10% preferred teaching environments with no online components or about one-half online and one-half face-to-face, or one being mostly but not completely online.

Teachers acknowledged institutional expectations of technology integration and did not need more encouragement or increased expectations from the administration. Nevertheless, the teachers identified factors that would motivate them to integrate more technology into their classroom teaching practices. Of the respondents, 50% needed more or better technology-oriented professional development opportunities, as well as considerations for professional advancement. Furthermore, 30% of the respondents would like to be assigned a classroom that matched their educational technology needs, to receive monetary or other value-oriented incentives, or to have clear evidence that students would benefit. In addition, 10% of the teachers expressed needs for release time to design/redesign their courses or work in a group to adopt the same types of practices to support their ability to better integrate technology in their lessons. However, none of the teachers wanted direct assistance from IT staff to support the technology that the teachers choose to implement. As mentioned earlier, when faced with technological problems, teachers preferred to ask colleagues or to figure it out on their own.

DISCUSSION AND CONCLUSION

This study explored high school ELT students’ and teachers’ perceptions and needs of technology integration during and after the COVID-19 pandemic in Thailand. It can be concluded that the

students' and teachers participating in this study generally embraced technology as a tool for enhancing learning and engagement while raising some issues that needed to be addressed for a more effective integration of technology in language classrooms.

The results of student questionnaires and interviews showed that students in this study believed they were well equipped with tools, skills and agency to study online. They were partially positive about their online learning experience during the COVID-19 lockdown and found online lessons using technology integration to be interesting and fun. The interview data confirmed students' positive attitude towards technology integration in education, as it enhances engagement and facilitates interactive learning experiences. Additionally, students appreciated the convenience and accessibility of learning materials through digital platforms. They also shared similar opinions expressed by students in Intharawiset et al. (2021), Nugroho and Atmojo (2022) and Prawiro and Ningrum (2021), particularly the organisational and communication benefits provided by Google Classroom. Students in this study acknowledged technical difficulties and anxiety as reported in Aung and San (2021), and computer hardware and Internet connection speed problems as reported in Prawiro and Ningrum (2021). Additionally, students in this study raised concerns about their devices' memory capacity to store classroom assignments and availability of a charging hub at the school. They were also concerned about possible health hazards of online learning from prolonged use of computer screens and stress. Nevertheless, they believed the problems were manageable and not major issues for them. The highlight from the interview was students' worrying about the teachers' lack of classroom management skills when using technology and digital material development skills which possibly led to their preference for an on-site lesson or a blended lesson where the lesson was taught in class with classroom management and revision materials available online.

The results of teacher questionnaires and interviews indicated that the teachers in this study integrated technology in classrooms beyond the pathways reported in the study by Azhar and Iqbal (2018) where reportedly teachers used technology to facilitate document management and basic classroom management, with it having no significant impact on teaching methodologies. As the teachers in this study had taught remotely, they utilised technology for a wide range of purposes, including document management, classroom management and teaching, using a combination of applications that the school had organised training for them, such as Google Classroom, Google Meet, Google Forms, Line and YouTube. In addition, some teachers took the initiative to implement other applications, such as Baamboozle and Liveworksheet during the COVID-19 lockdowns. The teachers in this study believed that technology integration was interesting for students. These results were consistent with the results of Akram et al. (2022) who found that digital technology was motivating and engaging, making students more active. Some teachers shared the teachers' beliefs expressed in Fitri and Putro (2021) that technology integration in classrooms was effective for teaching and learning to a certain extent. However, the teachers in the current study believed the school had provided adequate technology access and technical support for them, which was in stark contrast with the results of the research of Akram et al. (2022) and Fitri and Putro (2021) who reported challenges in integrating digital technology in classrooms in terms of a lack of Internet access and technical support and training from schools. Thus, they implemented the technology they had been trained to use. For example, most teachers used Google Classroom, Google Meets, and YouTube in the

classroom both during and after COVID-19 lockdowns. The support provided by the school contributed to the teachers' high levels of self-efficacy and their expressed self-confidence in effectively applying technology in their classrooms. Nevertheless, the teachers required further technology-oriented professional development and advancement opportunities to integrate more technology in their future classroom activities. Some teachers expressed the desire for more training, particularly in using a wider range of applications which echoed the importance of professional training and instructional support highlighted in the literature (Akram et al., 2022; Fitri & Putro, 2021; Garib, 2023; Tiangtrong, 2021).

Both students and teachers in this study had positive perceptions towards technology integration in English language classrooms, finding it interesting and engaging for students. Students' needs towards technology integration in English classrooms in this study slightly differed from those of teachers. Understanding these differences is crucial for creating effective technology integration strategies that address the needs of both students and teachers. Many teachers planned to integrate online classroom lessons with traditional classroom lessons in the future, while the students reported various preferences for the extent to which technology should be integrated in class. To address this discrepancy between the teachers' and students' opinions, it is suggested that teachers consult their students at the beginning of the term about the nature of technology integration in their classrooms. The other area of discrepancy needed to be addressed was the technological supports provided for students. As students reported preferences for searching for help on the Internet or from friends instead of a teacher, the teacher might not be aware of the problems and regards students as competent users. Thus, teachers should be particularly careful in introducing new technology to ensure that students can use and take advantage of the implemented technology (Chhoeut et al., 2023; Garib, 2023). The results of this study also pointed to the need for more technology-oriented professional development for the teachers. Notably, the results of teacher questionnaires indicated that 80% of the teachers planned to integrate online classroom lessons with traditional classroom lessons in the future, while 20% were still unsure. Therefore, in order to enhance teachers' efficacy and expedite the integration of technology in classrooms and fully utilise resources available at the school, there needs to be more technology-oriented professional development coupled with suitable classroom allocation to match the teachers' technology needs and a monetary or other value-oriented incentive. The potential areas of teacher training include training in digital teaching tools and learning material development, as well as methods to increase student-student interaction through technology. In addition, further research is needed to help teachers effectively integrate technology in different classroom contexts so that digital technologies become a dynamic component of pedagogy and content and easily accessed and used by students.

In the long term, the integration of technology in English classrooms is expected to create a more flexible learning environment, allowing for personalised education. With students readily open to embrace new technology for learning, teachers must be committed and competent in applying technology in their classrooms to take advantage of advanced technology. The study highlights the importance of a regular survey of students' and teachers' perceptions and needs in school administration. A clear understanding of students' and teachers' needs and perspectives towards technology integration in English classrooms has been critical in effective school administration to provide crucial support to improved proficiency in technology-assisted

language education for both students and teachers. A match between the administrators' objectives and the needs of students and teachers can help to reduce unnecessary administrative costs by providing directed training and resource allocation to expedite the effective integration of technology in future classrooms and prepare the teachers for future changes, which will ultimately shape the future of education.

Concerning the implications, the findings in this study underscore the need for educational institutions to identify the discrepancy between the students' and teachers' perspective and aim to bridge the gap between students, teachers and technology. In addition, teachers' perspectives and needs can be compared with the students' so as to identify and prioritise necessary areas for training. Educational institutions should provide adequate resources, professional development, and administrative and technological supports to teachers and students to facilitate the effective integration of technology in English language teaching.

Further study could be conducted to verify teachers' perceptions as evidence in how teachers practise their beliefs in the classroom through classroom observation. Moreover, this study focused on broad general perceptions and needs of students and teachers; future research can explore the specific types of problems that affect students' and teachers' performance and the activities combining pedagogical and technological knowledge that enhance meaningful and purposeful communicative practice.

ACKNOWLEDGEMENT

This research was supported by a grant from Kasetsart University Research and Development Institute (grant number 20420226510007000). The authors thank Dr. Andrew Warner and Dr. Liam Morgan for reviewing and editing the earlier draft of the article.

THE AUTHORS

Suphinya Panyasi, PhD, is an assistant professor at the Faculty of Education and Development Sciences at Kasetsart University, Thailand. Her research interests include professional teacher development, classroom action research, and English language teaching.
suphinya.pa@ku.th

Theerasak Soykeeree, EdD (Educational Technology), is an assistant professor at the Faculty of Education and Development Sciences at Kasetsart University, Thailand. His research interests include innovation and information technology for education, teaching techniques in the 21st century with digital learning, and teacher competencies in the 21st Century.
theerasak.s@ku.th

Dawutcha Taengsopa is an English teacher at Kasetsart University Laboratory School Kamphaeng Saen Campus Educational Research and Development Center, Thailand. His areas of expertise include teaching vocabulary, reading comprehension and phonetics.
dawutcha.t@ku.th

Wichittra Chansribut is an assistant professor at Kasetsart University Laboratory School Kamphaeng Saen Campus Educational Research and Development Center, Thailand. Her research interests include effective foreign language teaching techniques, online media in foreign language teaching, and innovations in foreign language teaching.
wichitra.c@ku.th

REFERENCES

Agarwal, H., & Pandey, G. N. (2013). Impact of e-learning in education. *International Journal of Science and Research (IJSR), 2*(12), 146–148. https://www.ijsr.net/archive/v2i12/MDIwMTM1NTg=.pdf

Akram, H., Abdelrady, H. A., Al-Adwan, A. S., & Ramzan, M. (2022). Teachers' perceptions of technology integration in teaching-learning practices: A systematic review. *Frontiers in Psychology, 13*, 1–9. https://doi.org/10.3389/fpsyg.2022.920317

Andrei, E. (2017). Technology in teaching English language learners: The case of three middle school teachers. *TESOL Journal, 8*(2), 409–431. https://doi.org/10.1002/tesj.280

Aung, M., & San, K. (2021). Usefulness of Google Classroom for management students of a Thai private university. *APHEIT International Journal, 10*(2), 1–10. https://so04.tci-thaijo.org/index.php/ATI/article/view/256353

Azhar, K. A., & Iqbal, N. (2018). Effectiveness of Google classroom: Teachers' perceptions. *Prizren Social Science Journal, 2*(2), 52–66. https://www.prizrenjournal.com/index.php/PSSJ/article/view/39

Bandura, A. (2005). Social cognitive theory: An agentic perspective. *Psychology, 12*(3), 313–333. https://doi.org/10.12681/psy_hps.23964

Chhoeut, S., Panyasi, S., & Soykeeree, T. (2023). Integrating TikTok with communicative activities to enhance grade 10 students' English-speaking skills at Hun Sen Mongkolborey High School, Cambodia. *Journal of Education and Human Development Sciences, 7*(2), 1–22. https://kuojs.lib.ku.ac.th/index.php/jehds/article/view/5389

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers and Education, 59*(2), 423–435. https://doi.org/10.1016/j.compedu.2012.02.001

Fitri, Y., & Putro, N. H. P. S. (2021). EFL Teachers' perception of the effectiveness of ICT-ELT integration during the COVID-19 pandemic. In L. Firdaus, Wachidi, Badeni, M. Kristiawan, Syafryadin, I. Maisarah, Noermanzah, E. Nursa'adah, A. P. Kartiwi, E. Viona, Sufiyandi, & M. Fadhli. (Eds.), *Proceedings of the international conference on educational sciences and teacher profession (ICETeP 2020)* (pp. 502–508). https://doi.org/10.2991/assehr.k.210227.086

Garib, A. (2023). "Actually, it's real work": EFL teachers' perceptions of technology-assisted project-based language learning in Lebanon, Libya, and Syria. *TESOL Quarterly, 57*(4), 1434–1462. https://doi.org/10.1002/tesq.3202

Georgina, D. A., & Hosford, C. C. (2009). Higher education faculty perceptions on technology integration and training. *Teaching and Teacher Education, 25*(5), 690–696. https://doi.org/10.1016/j.tate.2008.11.004

Intharawiset, T., Jareoan-sa, T., & Yuang-soi, P. (2021). ภาพสะท้อนการศึกษาไทยหลังภาวะโควิด 2019 [Reflection on Thai education after COVID 2019]. *Journal of Legal Entity Management and Local Innovation, 7*(4), 323–333. https://so04.tci-thaijo.org/index.php/jsa-journal/article/view/247120

Kenan Foundation Asia. (2023, January 26). *3 consequences of COVID-19 on Thai education*. Kenan Blogs. https://www.kenan-asia.org/blog/education/covid-19-thai-education/

Lai, C., Yeung, Y., & Hu, J. (2016). University student and teacher perceptions of teacher roles in promoting autonomous language learning with technology outside the classroom. *Computer Assisted Language Learning, 29*(4), 703–723. https://doi.org/10.1080/09588221.2015.1016441

Li, G., Sun, Z., & Jee, Y. (2019). The more technology the better? A comparison of teacher-student interaction in high and low technology use in elementary EFL classrooms in China. *System, 84*, 24–40. https://doi.org/10.1016/j.system.2019.05.003

Megawati, F., Mukminatien, N., Permana, A. I., Dewi, L. A., & Fitriati, F. (2021). Emergency remote teaching and learning: Technology-based instructional plan across grade levels. *Teaching English with Technology, 21*(2), 112–126. https://eric.ed.gov/?id=EJ1293794

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

National Cooperative Education Statistics System. (n.d.). *Technology in schools: Suggestions, tools and guidelines for assessing technology in elementary and secondary education-home*. National Center for Education Statistics (NCES). https://nces.ed.gov/pubs2003/tech_schools/chapter7.asp

National Statistical Office. (2025). *การสำรวจการมีการใช้เทคโนโลยีสารสนเทศและการสื่อสารในครัวเรือน พ.ศ. 2567 (ไตรมาส 4) [The 2024 household survey on the use of information and communication technology (Quarter 4)].* Ministry of Digital Economy and Society. https://www.nso.go.th/nsoweb/storage/survey_detail/2025/20250228090924_45646.pdf

Nugroho, A., & Atmojo, A. E. P. (2020) Digital learning of English beyond classroom: EFL learners' perception and teaching activities. *Journal of English Education and Linguistics Studies, 7*(2), 219–243. https://doi.org/10.30762/jeels.v7i2.1993

Prawiro, I. Y., & Ningrum, L. Y. (2021). An investigation of undergraduate students' perception in using Google Classroom application in ELT training classroom. *Journal of English Language and Language Teaching, 5*(1), 1–13.

Senawong, N. (2021). *การศึกษาพฤติกรรมการใช้สื่อออนไลน์ของคนเจนเนอเรชั่นแซดในยุค New Normal ในกรุงเทพมหานคร [A study of behavior for using social media of Generation Z in the New Normal Era in Bangkok]* [Master's Independent Study, Siam University]. e-Research Siam University. https://e-research.siam.edu/wp-content/uploads/2022/01/MBA-2021-IS-A-Study-of-Behavior-for-Using-of-Social-Media-of-Generation-Z-in-The-New-Normal-Era-in-Bangkok-by-Nichakun-Senawong.pdf

Sholah, H. M. (2020). Teaching and learning English using Google Classroom for Indonesian students. *Jurnal Pusaka, 8*(1), 1–12. https://ejournal.alqolam.ac.id/index.php/jurnal_ pusaka/article/view/375

Stanley, G. (2013). *Language learning with technology: Ideas for integrating technology in the classroom*. Cambridge University Press.

Tiangtrong, R. (2021). *การศึกษาการใช้เทคโนโลยีดิจิทัลเพื่อการจัดการเรียนรู้ของครูในสถานศึกษา สังกัดสำนักงานเขตพื้นที่การศึกษาประถมศึกษาสุโขทัย เขต 2 [A study of the use of digital technology for learning management of teachers in educational institutions under the Office of the Sukhothai Primary Educational Service Area 2]* [Master's Independent Study, Natesuan University]. NU Intellectual Repository. https://nuir.lib.nu.ac.th/dspace/handle/123456789/6379

Utecht, J., & Keller, D. (2019). Becoming relevant again: Applying connectivism learning theory to today's classrooms. *Critical Questions in Education, 10*(2), 107–119. https://academyforeducationalstudies.org/wp-content/uploads/2019/06/utechtkellerfinal.pdf

World Bank. (2021). *Mission: Recovering education in 2021*. https://thedocs.worldbank.org/en/doc/675f44dfad2b034dd0bc54ba2da258390090012021/original/BROCHURE-EN.pdf

Appendix 1

Student interview questions

1. Tell me about your experiences in using digital technology for language learning?
2. How do you feel about the effectiveness of your learning when digital technology is incorporated into your class?
3. What problems do you have when learning with online materials or using digital technology? How do you solve those problems?
4. In your opinion, what are technological facilities required for learning with digital technology?
5. In your learning context, how sufficient is the current technological facilities in supporting learning implementation?
6. How ready do you think your English teachers are to integrate technology in the classroom?
7. How ready do you think most students are to participate in learning with digital technology?

Appendix 2

Teacher interview questions

1. Have you ever applied digital technology into your teaching? If so, how?
2. How do you think the integration of technology affects your teaching?
3. How do you feel about the effectiveness of your teaching when incorporating the use of online teaching and learning into your traditional classroom?
4. What problems do you have when learning with online materials or using digital technology? How do you solve those problems?
5. In your opinion, what technological facilities are required for teaching with digital technology?
6. In your teaching context, how sufficient are the current technological facilities in supporting the implementation of teaching?
7. How ready do you think you are to integrate digital technology into your teaching?
8. How ready do you think most students are to participate in teaching and learning with digital technology?