An investigation of the use of information and communication technology in secondary schools: Teachers' voices

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ABSTRACT

Despite the fact that there has been a lot of research on online learning and the use of technology, researchers have paid very little attention to the use of information and communication technology after the COVID-19 pandemic, particularly on the perceptions of teachers who teach at the middle and high school levels. As a result, this study aims to analyze teacher perspectives on the use of technology, information, and communication, particularly in English subjects. A mixed methods technique will be applied in this investigation. To acquire a deeper understanding of middle and high school teachers' impressions of using ICT in English language learning, researchers utilize quantitative data from surveys and qualitative data from free-form writing. First, the questionnaire will be distributed to teachers using the Snowball method. After all the data from the questionnaire is received, the researcher will distribute some questions concerning the challenges, suggestions, and teachers' opinions on using ICT in English classes to obtain more in-depth information. The findings of this study show that teachers have a positive attitude toward using ICT, particularly in the teaching and learning process. One of the most important considerations is that incorporating technology into the teaching and learning process may improve the classroom atmosphere and engage students in the teaching and learning process. Future studies can explore teachers' perceptions using qualitative methods so that the data obtained will be deeper and can enrich the knowledge related to ICT use after the COVID-19 pandemic.

Keywords: ICT; EFL; Challenges; Teachers; Perspective.

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INTRODUCTION

Several years ago, a deadly virus known as COVID-19 spread over the world, wreaking havoc on all sectors, including education. About 1.7 billion students in approximately 190 countries (UNESCO, 2020) were instructed not to attend school to avoid infection. This large school shutdown, which may have never occurred before, causes the government to consider the best approach to ensure that the teaching and learning process continues (Adedoyin & Soykan, 2020; Hossain, 2021; Yandell, 2020), and the greatest choice is to shift the learning process away from face-to-face learning to learn online.

Technology, information, and communication (hence shortened as ICT) have enabled instructors and students to continue the teaching and learning process. ICT is the most significant feature during the pandemic that must be employed during distant learning (Bhaumik & Priyadarshini, 2020; Chakma et al., 2021; Li, 2022). The use of technology may make the teaching and learning process more engaging for students, eventually impacting their grades.

Furthermore, two modalities of learning utilizing ICT may help the learning and teaching process. There are two types of modes: asynchronous and synchronous. Before the pandemic, most learning was done face-to-face and via asynchronous forms, such as Email, Learning Management System, Google Classroom, Edmodo, and so on (Bailey et al., 2021). Teachers may submit instructional materials anytime and anywhere in this initial mode, which is helpful to them. Likewise, teachers or instructors typically exchange course resources (texts, videos, recordings, assignments, and so on) in their learning management systems (Öztürk, 2021; Rigo & Mikus, 2021). Students can download materials and upload assignments anytime as long as they can access the internet. They are not forced to do so during specific hours unless the teacher instructs them otherwise. However, synchronous learning is required during the COVID-19 pandemic since it is real-time, like face-to-face learning. Platforms like Zoom, Google Meet, and Skype are frequently used when employing synchronous mode.

ICT learning cannot be divorced from perceived issues by instructors, students, and parents. Students from low-income households may have trouble attending classes owing to a lack of equipment or an internet quota (Schleicher, 2020). Teachers must create new teaching and learning approaches, which may necessitate more ICT and pedagogical training (Ashraf et al., 2021). Many teachers focusing on conventional teaching and learning have significant challenges in this area (Ashraf et al., 2021; Tsegay, 2015). In contrast, research shows that teachers familiar with interactive technology can adapt to online teaching quickly (Garrison & Vaughan, 2012). From these different points of view, it is necessary to conduct research on teachers' views regarding the problems they perceive regarding the use of technology, information and communication during the learning and teaching process.

ICT role in the world of education is very significant because using technology inside and outside the classroom can make students active and increase student engagement (Kew & Tasir, 2022) and their learning performance (Hashemi et al., 2022). In this context, the employment of technology in education, particularly English language learning worldwide (Caponetto et al., 2014), is a highly intriguing issue to investigate. Innovation has transformed language education by creating open learning resources online that can be accessed at any time and from any location using ICT.

According to Çakıcı (2016), ICT is a robust approach to educating students studying English as a foreign language (EFL), such as in Indonesia. Teachers may use ICT most effectively by incorporating visuals, audio-visuals, and audio into all the abilities taught, including speaking, listening, reading, and writing. These technologies have been included in educational activities to promote foreign language proficiency (Alkamel & Chouthaiwale, 2018). In other words, instructors can use ICT as a teaching medium in the teaching and learning process, particularly in English language social skills (Apriani, 2017).

Technology formerly employed solely in the natural sciences is increasingly making it into the social sciences. The pandemic that has ravaged the world for nearly two years has compelled instructors in all sectors, particularly English Education, to optimize its usage in learning and teaching. Furthermore, two years of online learning should have familiarized instructors and students with the use of technology. Research on the difficulty's teachers face in using information and communication technologies at the junior and senior secondary school levels is urgently needed to address the literature void. For some teachers, incorporating technology into the learning process takes much work. Teachers used to utilize conventional techniques, such as simply reading books, may find it challenging to employ ICT. These problems are referred to as barriers. An

impediment or problem is "any condition that makes progress or achievement of a goal difficult" (Schoepp, 2005). Several challenges or barriers to instructors using technology in the teaching and learning process have been noted in the literature.

Students face various challenges while using ICT during distance or online learning. (Octaberlina & Muslimin, 2020) found three barriers: unfamiliarity with e-learning, inadequate internet access, and physical issues such as weary eyes from spending too much time in front of a computer. Siddiquah & Salim, (2017) state that other hurdles in online learning include a lack of internet connection, inaccessibility of vital apps, a lack of technical help, malware risks, computer slowness, and internet signal problems.

Lack of access to ICT gear and light devices is an issue that must be addressed, particularly in schools located in rural areas. If the government is serious about expanding education, it must invest in infrastructure. Based on the study (Akbulut et al., 2011; Voogt et al., 2013), infrastructure is critical for successfully integrating ICT into education. However, many schools must be exposed to ICT, particularly in developing countries like Indonesia.

Khan et al., (2011) highlighted two obstacles that instructors and students face while using ICT: (1) sluggish internet, (2) a shortage of PCs, (3) a lack of time to exploit technical resources, bad internet connection, a lack of printer access, ineffective training, and a lack of time to study ICT. The absence of sufficient teacher training in the usage of ICT is an evident barrier. Training is typically delivered in broad strokes, with limited practice opportunities, making it difficult for instructors to use the technology they have just learned. From the issues above, it can be seen that there are quite a lot of issues regarding the use of technology and require further investigation, especially on issues that have arisen after the Covid-19 pandemic.

Knowing teachers' views on the use of technology, information, and communication in the teaching and learning process is very important because their views can influence their actions in integrating technology inside and outside the classroom. The importance of research on teacher beliefs stems from the possible relationship between beliefs and practice. Due to the importance of research regarding teachers' views or beliefs, this research has been conducted for more than 60 years (Ashton, 2014) and provides strong support for the idea that perceptions play an important role in influencing teacher behaviour in the classroom (Mansour, 2008).

Until now, a lot of research has been conducted regarding teachers' views on the use of ICT, especially in learning English, both as a foreign language and a second language. Also, with the massive use of ICT, many researchers have investigated student and teacher perceptions of the use, advantages, disadvantages, and problems faced using technology (Saputra et al., 2022). Research related to online learning during the Covid-19 pandemic, which focuses on student perceptions, has been carried out by several researchers (Bhattarai, 2021; Khafaga & Shaalan, 2021; Saputra et al., 2022; Shukri et al., 2020). Research can also be categorized from the perceptions of teachers who teach middle school and high school (König et al., 2020; Kuzembayeva et al., 2022; Saputra et al., 2022), and at the university level (Abduh, 2021; Alhuwaydi, 2021; Hashemi, 2021; Naylor & Nyanjom, 2021).

In addition, Nguyen (2021) also investigated university-level instructors' perspectives on ICT integration in English language education in Vietnam. The study used a mixed method approach that included primary sources, questionnaires, and semi-structured interviews. Teachers were found to be well aware of the need to incorporate technology, information, and communication and to have a good attitude toward using ICT in English language learning at the university level. Female students used a far more comprehensive range of platforms than male students. However, male students were shown to be more adept in utilizing ICT than female students, even though female students perceived ICT as more beneficial in learning foreign languages.

Researchers discovered gaps in earlier studies, particularly on the problem of ICT use after the pandemic, based on the introduction and evaluation of the literature review that was given. Moreover, even though there has been much research related to online learning and the use of technology, as mentioned in the preceding paragraphs,

researchers have paid very little attention to the use of information and communication technology after the Covid-19 pandemic, particularly on the perceptions of teachers who teach at the middle and high school levels. This research covers current gaps and contribute to the body of knowledge about the usage of ICT in schools following the pandemic. Therefore, researchers are interested in filling the existing gaps by investigating teachers' views regarding the use of ICT after the COVID-19 pandemic. Finding out what the actual views of middle school and high school teachers are will add to the body of knowledge to enable the use of ICT more effectively in the future. This is significant because the learning model has shifted; before the pandemic, learning was predominantly face-to-face; currently, blended techniques or a combination of face-to-face and online are used. This research is expected to shed light on the implementation of ICT in secondary schools, as issues found in this study are still relevant in teaching and learning in the 21st century.

METHODS

Research method

In this research, an exploratory sequential mixed methods approach is used, with quantitative data supplemented with qualitative data (Creswell, 2013). This research used a combination of quantitative data obtained from questionnaires and qualitative data through free-form writing to gain a better understanding of middle and high school teachers' perceptions of the use of ICT in English language learning. Because this research seeks to examine teachers' views on the use of Technology, Information and Communication, both surveys and semi-structured interviews will be distributed.

Respondent

In this research, researchers asked for the willingness of teachers who teach in junior high schools (SMP) and senior high schools (SMA), especially in English subjects in Bengkulu, Indonesia. Teachers were informed that the data provided was only for research purposes and data that identified teachers and schools would remain confidential. There were 31 participants in this research, all of whom were teachers who taught at junior and senior schools. Of the 31 participants, nine teachers were asked to complete free-form writing to answer questions related to barriers to using ICT, suggestions and finally enrich the data from the questionnaire.

Data collection and data anlysis

Likert Scale surveys and interviews were used to obtain data. Survey questions were adapted from Ghavifekr et al. (2016) who investigated middle and high school teachers' perceptions of issues and challenges in the use of ICT in Malaysia. The questionnaire is based on a 5-point Likert Scale ranging from: 5 = Strongly agree, 4 = agree, 3 = Neutral, 2 = Disagree, and 1 = Strongly disagree. The survey will be distributed online using the Google Form Platform where each teacher will be asked to send it to their colleagues as well so that this research is expected to have quite a lot of participants because it uses the Snowball sampling technique. The various sections of the questionnaire include: (A) Personal Details, (B) Experience with ICT for Teaching, (C) Access to ICT for teaching, (D) Support for teachers for the use of ICT, (E) Challenges in using ICT tools in teaching and learning, (F) Teacher ICT skills, (G) Teacher opinions about the impact of ICT use on student learning outcomes.

Data collected from respondents were collected together for analysis using Microsoft Excel. Researchers used descriptive analysis to analyze frequencies and percentages of the overall population in demographic background. Apart from that, it is also used to determine the average, standard deviation, frequency and percentage.

RESULTS AND DISCUSSION

This section is divided into four categories: The demographic of respondents, teachers' perspectives on the use of ICT technologies in the classroom teaching and learning process, the challenges for school teachers in utilizing ICT tools in the teaching and learning process in the classroom, and the extent to which teachers use ICT tools in teaching and learning in the classroom. The discussion is merged into the findings as well.

Demographic of Respondents

Table 1 below will describe the demographic background of the research participants

Table 1. Demographic findings of participant.

Factor	Category	Frequency	Percentage
Age	Under 25	1	3.2%
	26-30	7	22.6%
	31-35	9	29%
	36-40	6	19.4%
	41-45	4	12.9%
	46-50	2	6.5%
	50+	2	6.5%
Gender	Male	12	38.7%
	Female	19	61.3%
Teaching experience	Less than one year	2	6.5%
	1 - 4 years	5	16.1%
	5 - 10 years	5	16.1%
	10 – 20 years	15	48.4%
	More than 20+	4	12.9%
Teaching	Junior High	11	36.7%
	Senior High	19	63.3%

From table one, it can be seen that the total number of respondents who filled out the questionnaire was 31 people, with the number of female participants exceeding male participants, 61.3% and 38.7% respectively. In terms of teaching experience, the majority of participants who filled in had teaching experience from 10 to 20 years with a total of 15 people (48.4%), while the fewest participants had teaching experience of less than 1 year with a total of 2 participants (6.5%). There are 19 senior high teachers and 11 junior high teachers, with the bulk of participants being over 25 years old, with the oldest participants being two persons over 50 years old and the youngest being one person under 25 years old.

1. What are school teachers' perspectives on the use of ICT technologies in the classroom teaching and learning process?

The following table shows the descriptive statistics related to the perceptions or views of junior high and senior high school teachers regarding the implementation of ICT in the learning and teaching process.

Table 2. Teachers' Perceptions on implementing ICT tools in teaching and learning

Item	SD	D	N	A	SA	Mean	SD
Students focus better on what they are studying when they use ICT.	3.2%	-	22.6%	41.9%	32.3%	4	0.916

Students study more actively about the content being learned when they use ICT.	-	3.2%	12.9%	48.4%	35.5%	4.16	0.767
Students feel more independent in their learning using ICT (they may redo tasks if required, investigate topics in more depth, and so on).	-	-	9.7%	48.4%	41.9%	4.31	0.644
Students can better grasp the teacher's materials when they use ICT.	-	3.2%	3.2%	48.4%	45.2%	4.38	0.707
Students recall their teachings better when they use ICT.	-	-	16.1%	38.7%	45.2%	4.28	0.729
ICT facilitates collaborative work between students	-	-	12.9%	29%	58.1%	4.44	0.716
ICT makes the classroom situation more lively, students become more active.	-	-	3.2%	35.5%	61.3%	4.56	0.564

*SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

With an average of 4.56%, the highest data on the seven items is data which pertains to the use of ICT to make teaching and learning settings more dynamic so that students are more involved in the teaching and learning process. It is safe to say that practically all responders agree on this matter. Because the manner of teaching the information in the curriculum does not meet the qualities of the students, the teaching and learning process might become uninteresting if technology is not used. According to Lukas (2014), one of the primary causes for students' boredom in the classroom is the belief that the techniques used to convey the material are inconsequential for the way they learn. Because our students are "digital natives", who live in an all-digital world, we should integrate technology into our teaching.

The second highest is related to the use of ICT which can facilitate collaborative working between students, with an average of 4.44 which shows that more than three-quarters of the total respondents agree with this item. This is in line with research conducted recently by Balol (2023) who found that 76.90% of respondents said that by using ICT and learning collaboratively, students could work more actively. Also, 69.20% said that by discussing using technology, group discussions were enjoyable. One of the reasons might be because technology provides pupils with engaging sights and music, as well as colors and moving pictures that are not available when learning is delivered conventionally.

Then, participants also expressed their agreement regarding the item which stated that it would be easier for students to understand the material provided if the material was provided using technology, with an average of 4.38, the third highest. It might be because the subject presented can be explored on search engines such as Google to broaden their understanding so that they do not rely just on the material provided by the teacher. English teachers would benefit more from integrating ICT, as stated by Burden and Shea (2013), who claim that isolating ICT as a topic has minimal influence on student learning results. As a result, ICT must be integrated into every subject, including English, as well

as every component, including listening, speaking, reading, and writing. Moreover, if ICT is taught separately, some teachers experience complex difficulties in designing and implementing existing technology into learning (Aniq & Drajati, 2019).
Overall, those participating in this study who taught at the junior and senior high levels had a good attitude toward the use of ICT in the student learning and teaching process.

2. What are the challenges for school teachers in utilizing ICT tools in the teaching and learning process in the classroom?

Table 3 indicates the issues or challenges the participants in the research face while implementing ICT in the learning and teaching process.

Table 3. Challenges in utilizing ICT

Item	SD	D	N	A	SA	Mean	SD
Lack of computers/laptops	3.2%	3.2%	29%	19.4%	45.2%	4.03	1.092
Few computers are connected to the Internet	6.5%	6.5%	22.6%	32.3%	32.3%	3.81	1.176
Insufficient/unstable internet connection	-	9.7%	22.6%	25.8%	41.9%	4.03	1.031
Computer systems that are not up-to-date.	12.9 %	9.7%	19.4%	29%	29%	3.47	1.367
Lack of teacher ability in operating computers	16.1 %	22.6 %	22.6%	22.6%	16.1%	3.03	1.332
Lack of technical support from teachers	12.9 %	25.8 %	25.8%	16.1%	19.4%	3.06	1.318
Lack of adequate content related to learning	19.4 %	19.4 %	25.8%	19.4%	16.1%	2.91	1.353
It is very difficult to integrate ICT into the curriculum	29%	32.3 %	12.9%	16.1%	9.7%	2.44	1.318
Lack of learning models related to how to use ICT for learning	22.6 %	22.6 %	22.6%	19.4%	12.9%	2.81	1.355
Uncomfortable computer room situation (size, furniture)	9.7%	9.7%	25.8%	29%	25.8%	3.5	1.244
Lack of interest among teachers in using ICT	16.1 %	19.4 %	25.8%	25.8%	12.9%	3.03	1.282
Unclear benefits of using ICT for teaching and learning	38.7 %	25.8 %	16.1%	9.7%	9.7%	2.22	1.338

*SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

From the data in Table 3, the highest average is for the items lacking laptops or computers at school and unstable internet at school, with an average of 4.03

respectively. For the former item, these results are aligned with research conducted by Ghavifekr et al. (2016) who conducted research on junior and senior high-level teachers in Malaysia. The data shows an average of 4.13, which means it is almost the same as the data in current research. Meanwhile, the latter contradicts their finding, which reveals an average of just 2.02, indicating that instructors in Malaysia do not think the internet signal is shaky. However, findings from research by Saputra et al., (2022) support the findings of this study that of the 73 participants, only an average of 2.32 stated that they had good Internet connectivity and computers, which is relatively low. This might be because the signal is extensively diffused there, whereas, in Indonesia, many places still do not receive a reliable signal. Here are some excerpts from teachers' comment:

> *Internet connection is always an obstacle as well as the lack of projectors in schools (#T2)*
>
> *Students are still not responsible for the facilities they have such as cell phones, sometimes there are students who play games while studying (#T4)*

Almost all of the nine teachers asserted that the primary obstacle to using ICT in teaching and learning was network limits, while others mentioned facilities. Those who claimed that their pupils still have no idea the value of keeping expensive infrastructure, hence the facilities are not effectively maintained.

3. To what extent do teachers use ICT tools in teaching and learning in the classroom?

Table 4 displays descriptive information regarding how teachers utilize ICT technologies in the classroom for teaching and learning.

Table 4. The Use of ICT Tools in Classroom

Item	Never	Rarely	Some-times	Often	Always	Mean	SD
I use Slides created using Power Point/ Canva/ other applications.	-	6.5%	12.9%	38.7%	41.9%	4.19	0.896
I use several interactive websites in the teaching and learning process such as Kahoot! Quizzez, etc	9.7%	6.5%	16.1%	48.4%	19.4%	3.63	1.157
I teach hybridly using Zoom/Gmeet/other applications.	9.7%	12.9 %	32.3%	32.3%	12.9%	3.28	1.143
I use Google Classroom/Moodle/ other applications for asynchronous teaching.	9.7%	19.4 %	22.6%	32.3%	16.1%	3.28	1.224
In online teaching, I prefer to use WhatsApp rather than Zoom or other applications.	3.2%	16.1 %	41.9%	12.9%	25.8%	3.41	1.132

The highest average in table 4 is seen in the points where teachers utilize slides or Canva in teaching English, with an average of 4.19. This might be due to teachers being accustomed to utilizing ICT during the Covid-19 epidemic and continuing to utilize it during offline learning. Tomczyk et al. (2021) found that Most teachers positively assess elearning as an opportunity that can be used. The hybrid learning point has the lowest average of 3.28 items. This might be because, since the end of pandemic, schools have incorporated face-to-face schooling, reducing the intensity of online learning. However, Tomczyk et al. (2021) in their study found that two thirds of respondents indicate that blended learning is the most effective solution.

CONCLUSION

This study investigates teachers' perspectives of ICT, especially in three areas: teacher beliefs of incorporating ICT tools in teaching and learning, challenges to using ICT, and classroom usage of ICT tools. Based on the findings of this study, teachers have a positive attitude toward using ICT, particularly in the teaching and learning process. One of the most important considerations is that incorporating technology into the teaching and learning process may improve the classroom atmosphere and involve students in the teaching and learning process. Finally, their grades will improve if students are engaged and excited about learning. With the empirical facts in this study, it is intended that every junior or senior-level teacher integrate technology into their classroom teaching. It is envisaged that stakeholders would be able to promote stable internet networks in schools, overcoming existing challenges associated with unstable internet connections.
The present study has some limitations that should be acknowledged. Future studies can explore teachers' perceptions using qualitative methods so that the data obtained will be deeper and can enrich the knowledge related to ICT use after the COVID-19 pandemic. Also, the relatively small number of participants may mean that this data cannot be generalized, so future research is expected to examine many participants. Besides that, this questionnaire did not go through a validation process even though the researchers had discussed it with each other. It is hoped that further research can validate the questionnaire before continuing the research process.

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AUTHOR CONTRIBUTIONS

Saputra, D. B.: Conceptualization (lead), methodology (lead), writing – original draft (lead), review (supporting). Puspa, A.: writing – original draft (supporting), review, (lead) editing (lead). Haryana, L.: review, (supporting) editing (supporting). Muswari, R.: review, (supporting) editing (supporting).

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