

EFL Teachers' Beliefs and ICT Integration Practices During Distance Learning: Employing Replacement, Amplification, and Transformation Framework

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Abstract

Technology is successfully integrated when technology makes learning effective, efficient, and creative. It cannot be denied that technology positively contributes to teaching and learning. Moreover, in the current pandemic conditions where the learning process must be carried out remotely, technology helps this teaching and learning process more accessible. The objective of the study is to see the EFL teachers' beliefs and ICT integration practices during distance learning. This study investigates teachers' beliefs of ICT integration based on the current theory and situation. The researchers used a qualitative approach in this case study; three EFL teachers were interviewed and observed. The finding of the study is all EFL teachers had positive beliefs about ICT use for teaching and learning and student-centred belief orientation for pedagogical belief. One of three had low-self efficacy to utilize ICT. ICT was integrated for effective and efficient learning, which means teachers' level of ICT integration was Amplification based on the RAT (Replacement, Amplification, and Transformation) framework. However, overall, teachers' beliefs orientation were positive belief about ICT integration, high self-efficacy belief, student-centred belief. Still, they could not reach the high level of ICT integration linked to creativity in teaching. They also faced some barriers in integrating ICT, such as students' engagement and the learning in the distance still incomplete. They missed the motivation or stimulation stage for their students and the students' learning process was lack of speaking and listening enhancement activities. Additional research should address more people as data objects to corroborate research results.

Keywords: ICT integration, RAT framework, Teachers' Beliefs, Self-efficacy beliefs, Pedagogical beliefs

INTRODUCTION

ICT is one of the important equipment in teaching and learning. Due to pandemic cases, teachers have felt the need to integrate ICT frequently into learning in the past year. Although teachers may use technology often, they do not always integrate it successfully. Effective integration of technology into teaching and learning remains a challenge (Rodríguez et al., 2012). There are still many barriers that should be faced to achieve successful technology integration (Farjon et al., 2018). The obstacles of teachers' technology integration come from internal and external factors. External barriers include a lack of resources in schools based on technology, time constraints, or a lack of technical or pedagogical support. Internal barriers are intrinsic to teachers and include their beliefs on teaching and technology integration (Eickelmann & Vennemann, 2017).

The use of technology in teaching is tied to teachers' beliefs, and teachers' beliefs significantly impacted their effective use of ICT in teaching (Tondeur et al., 2017). According to Zheng (2015), teachers' beliefs are a personal system that can lead their thinking, action, and behaviour associated with the teaching and learning process. Beliefs influence teachers' decisions to decide specific technology for effective and efficient instructions (Ertmer, 2005). Teachers who believe in the effective use of technology for learning tend to use technology and assume that technology is utilized for students' learning and self-efficacy. On the contrary, teachers who do not believe in the value of technology use tend to ignore technology integration (Kim, 2015).

The orientation of technology integration is dominantly for pedagogical goals (Enochsson & Rizza, 2009). It relates to teachers' pedagogical beliefs. Teachers' pedagogical beliefs can act as barriers to technology implementation (Toundeur et al., 2016) and influence technology adoption in the classroom (Ertmer, 2005). A teacher who has traditional beliefs such as teacher-centred tends to avoid technology use, and teachers who have constructivist student-centred methods tend to use technology for learning (Toundeur et al., 2016). Hence, teachers need to pay attention to their beliefs related to the use of technology, considering their beliefs as preliminary funds for successfully implementing technology in the classroom.

Ding et al. (2019) investigated EFL teachers' pedagogical beliefs and their technology integration practices in the classroom. The findings indicated that EFL pedagogical beliefs be following their technology integration practices. Hsu (2016) has conducted a study concerning teachers' beliefs and technology integration. The study examined teachers' beliefs, practices, and barriers to technology integration. This study showed that teachers who hold constructivist pedagogical beliefs about using technology had strong self-efficacy beliefs, put positive interest in using technology, and had two or more high-level activities in their lessons.

The studies by Ding (2019) and Hsu (2016) are related to teachers' beliefs and practices using technology in the classroom. They still need further investigation of teachers' beliefs of ICT integration based on the current theory and situation. This study is carried out to fill this gap with the focus on investigating teachers' beliefs and practices on integrating ICT and the extent to which the technology is adopted based on teachers' ICT level integration.

The theories that underlie the study are the RAT (Replacement, Amplification, and Transformation) model and teachers' beliefs and technology. The framework from Hughes et al. (2006) called the RAT model is utilized to reveal teachers' level ICT integration practices. The rationale for using this theory is that the theory assists in determining the level of teachers in technology integration by sequencing the teaching step in logical order. Hence, this framework can be employed for getting detail about teachers' ICT integration based on step by step in teaching. Still, this framework merely focuses on technology integration results, not on the process. It simply focuses on the extent to which technology is adopted in teaching without considering the background knowledge of teachers. Furthermore, the theory about teachers' beliefs and technology from Taimalu and Luik (2019) and Hsu (2016) also indicates teachers' beliefs, stating that a teacher's belief is a roof concept for pedagogical belief, self-efficacy belief, and belief about technology as well as dichotomized for each belief. The terms are discussed.

RESEARCH METHOD

This study used a qualitative approach in a particular descriptive case study as a method. A descriptive case study describes a phenomenon in its natural setting (Yin, 2018). This method is appropriate for this research because it reveals teachers' beliefs concerning ICT integration in a real-world context. Furthermore, this research was conducted in a senior high school in Bandung. This school was chosen because of the possible access and the consideration of data availability. Moreover, research participants were selected purposively based on the research objectives in this study. Three EFL teachers who participated have qualifications such as (a) speaking English as a foreign language, (b) using ICT in their teaching, and (c) teaching in senior high schools for 2-3 years.

Data Collection

According to Yin (2018), two types of data collection techniques are employed in this study: a) **Interviews** were carried out with the research participants to gain in-depth answers. The method of interviews used in this study was open-ended interviews. The interviews have been conducted in four major processes: conducting the open-ended interview, recording the interview, translating the interview, and transcribing the interview. The interviews used Bahasa Indonesia to gain in-depth answers. Another technique is b) **Observation**. The observation was conducted towards classroom and teachers' documents to get information about EFL teachers' technology practices. The observation technique was the non-participant observation, and the researcher acted as an observer who did not involve in the event (Yin, 2018). There were two main activities for this technique: observing and gathering field notes.

In detail, the interviews were conducted to gain information about EFL teachers' beliefs and their ICT integration practices. The questions were adapted from Taimalu and Luik (2019), Hsu (2016), and Hughes et al. (2006). The interview was carried out for about 60 to 90 minutes, and it was conducted via a Whatsapp call. Furthermore, the observation gathered information about EFL teachers' ICT integration practices. It was carried out by observing the platforms or applications teachers used to teach in distance learning because of pandemic situation.

Data Analysis

The data was evaluated using Yin's procedures (2018). The data analysis process included several phases: Compiling, disassembling, reassembling, interpreting, and concluding. First, compiling was conducted to organize and sort the data in some order. Second, disassembling was carried out to break down compiled data into smaller parts. The procedure was followed by giving codes or labels to the data pieces. Third, reassembling was carried out to reorganize the parts of data into various groups and sequences. Forth, interpreting was carried out to give sense to the findings. For this step, the researchers used the pattern matching technique from Yin (2018). It was used to compare the data with the theories from other researchers. Fifth, concluding was carried out to conclude the findings.

RESULTS

In this part, we present our findings regarding (a) the EFL teachers' beliefs about ICT integration, (b) the EFL teachers' technology integration practices, and (c) the interconnection between EFL teachers' beliefs and ICT integration practices. The results provided in this part were chosen to represent this study.

a. The EFL Teachers' Beliefs about ICT Integration

Table 1 presents teachers' beliefs orientation about ICT integration in the class. In this research, we found that teachers had four kinds of beliefs orientation. The beliefs are shown based on their type, and the description of each is followed.

Table 1

EFL Teachers' Beliefs

Subject	Beliefs Orientation	Beliefs Description
Teacher A Teacher B Teacher C	Teachers' Positive Belief about ICT integration	Beliefs about the positive impact of technology on student learning (Hsu, 2016)
Teacher A Teacher C	Teachers' High Self-Efficacy Belief	High levels of confidence to use technology for teaching and learning (Hsu, 2016)
Teacher B	Teachers' Low Self-Efficacy Belief	Low levels of confidence to use technology for teaching and learning (Hsu, 2016)

Subject	Beliefs Orientation	Beliefs Description
Teacher A Teacher B Teacher C	Student-Centred Belief	Beliefs about incorporating technologies to support high-level student learning or other student-centred practices (Hsu, 2016)

All participants emphasized the importance of ICT integration based on the results of the interviews. They believed that ICT had an immense impact on teaching and learning. They agreed that the role of ICT is essential because the learning should be in line with the development of technology or digital era as teacher A said in the interview: *“The idea of using technology for teaching is great because our education should follow the development of technology and science.”* Besides, teacher B perceived that: *“Technology supports us as a teacher to teach in the modern era,”* and Teacher C stated that: *“The use of ICT is important because day by day the development of technology are raising significantly.”* Moreover, each teacher mentioned other benefits of the technology used for learning, such as supporting time efficiency, fun learning, and students' motivation.

Two teachers described high self-efficacy when they used technology for teaching and learning. They uttered that they were confident enough to use technology. As teacher A stated in the interview: *“I am confident when using technology because I am interested in teaching that innovative and creative embedded.”* On the contrary, only one teacher was not convinced to use technology. She said, *“I am not sure when I face new technologies or an application for teaching, and I am just not sure whether I can operate it or not. Sometimes, recent applications for education make me confused, and I still need peer guidance to use it.”*

The teachers oriented their learning to focus on students' needs, goals, and style while incorporating technology. They perceived that technology could support student-centred learning. For example, Teacher C conveyed that *‘I emphasize students and focus on learning on the process, not only the result. And I think technology can encourage me to increase student-centred learning because the learning can be in various ways, and students can enjoy the learning.’*

b. The EFL Teachers' Technology Integration Practices

All teachers had access to technology for teaching and learning (see Table 2, 3, 4). They used various kinds of technologies to be applied. The main activities of utilizing technology are presented in the table, and the activities are divided into some categories based on teaching and learning stages.

Table 2

EFL Teachers' ICT Integration Practices for Instructional Method

Instructional Method	Subject	Technology resources	Activities
Preparation	Teacher A	Microsoft Word, Whatsapp	Making a lesson plan and checking students' attendance
	Teacher B	Microsoft Word, Whatsapp	
	Teacher C	Microsoft Word, Google Classroom	
Interaction with students	Teacher A	Google Classroom, Whatsapp	Giving instruction or information and communicating with students
	Teacher B	Google Classroom, Whatsapp	
	Teacher C	Zoom, Google Classroom, Whatsapp	
Assessment of students	Teacher A	Google docs, Microsoft Excel, pollev.com	Collecting the score of students' tasks and assessing students' work
	Teacher B	Google docs, Microsoft Excel	
	Teacher C	Google docs, Microsoft Excel	

The instructional methods encompass some teaching and learning processes such as preparation, interaction with students, and assessment of students (Hughes et al., 2006). All teachers used Microsoft word to make and to prepare a lesson plan in the preparation process. Besides, they used Whatsapp to check students' attendance lists, and only Teacher C used Google classroom to check students' attendance lists.

In the interaction process with students, Google classroom and Whatsapp were dominantly used by teachers to give instruction or information and communicate with students. Zoom was merely used by Teacher C. Moreover, Whatsapp is more likely used by teachers and students to do two-ways communication.

Google docs were dominantly applied for assessing students. The teachers usually collect students' tasks and evaluate students' work. Teacher A utilized another technology web-based for assessing students' work, such as pollev.com. To recap students' scores, all teachers employed Microsoft excel to recap and calculate students' scores easier.

Table 3**EFL Teachers' ICT Integration Practices for Students' Learning Processes**

Students learning Processes	Subject	Technology resources	Activities
Learning Activity	Teacher A	PowerPoint, Google Classroom, Whatsapp	The teacher gives learning material that students should read.
	Teacher B	Google Classroom, Whatsapp	
	Teacher C	PowerPoint, Google Classroom, Zoom	The teacher gives learning material that students should read while explaining it.
Task Milieu	Teacher A	Google docs, Google Classroom	The teacher asks students to do the task individually, such as multiple-choice essays, or write the learning materials.
	Teacher B	Google docs, Google Classroom	
	Teacher C	WA, Google docs, Google Classroom	

English was taught using PowerPoint, Google Classroom, Whatsapp, and Zoom. It helped students or teachers easily find materials when they need them for review or future class. The teachers delivered learning materials mostly in one-way communication and asked the students to read and understand by themselves. Along the learning process, most activities of students were reading and writing the learning materials, and English learning activities were lack of speaking and listening practice.

Some learning materials were provided on PowerPoint. Using PowerPoint makes learning materials easier to be presented, and it assists teachers in explaining them. Moreover, the PowerPoint slides were uploaded to google classroom, making it easy to find or edit for future activities. It can be compared with saving only on a laptop. Sometimes, teachers find it hard to search or forget the file's location.

After giving the materials, the teachers asked the student to do some tasks, and mostly it should be done individually. All teachers applied Google Classroom and Google Docs to provide multiple choice or essay questions. Besides, the applications assisted teachers in automatically assessing students' work. The teachers did not correct students' results one by one, and it decreased teachers' errors in evaluating students' work.

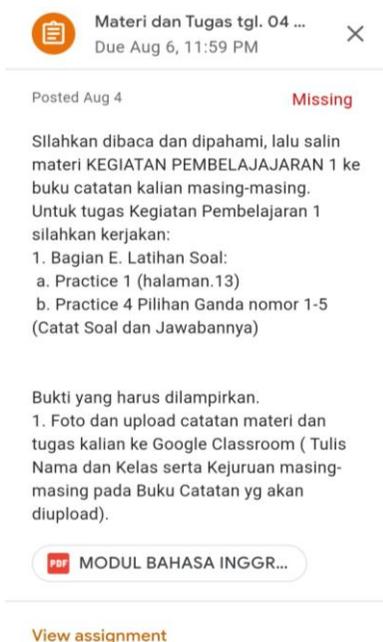


Figure 1. The Example 1 of Students' Learning Processes



Figure 2. The Example 2 of Students' Learning Processes

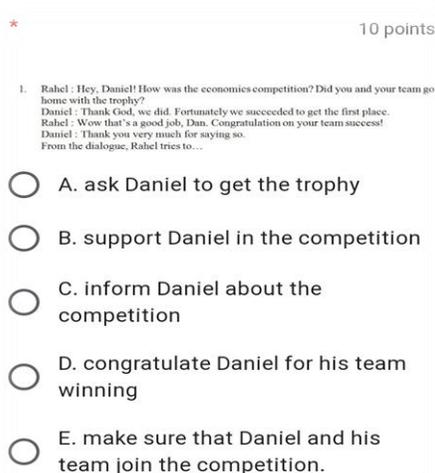


Figure 3. The Example 3 of Students' Learning Processes

All teaching or learning stages were covered and assisted by technology. The teachers attempted to apply technology in their teaching steps to pursue curriculum goals.

Table 4

EFL Teachers' ICT Integration Practices for Curriculum Goals

Curriculum goals	Subject	Technology resources	Activities
Knowledge and experience to be gained, learned or applied.	Teacher A	Ms Word, Whatsapp, Google Classroom, Google docs, Microsoft Excel, pollev.com, PowerPoint	Teachers reach learning objectives based on technology-assisted.
	Teacher B	Ms Word, Whatsapp, Google Classroom, Google docs, Microsoft Excel	
	Teacher C	Ms Word, Whatsapp, Google Classroom, Google docs, Microsoft Excel, PowerPoint, Zoom	

The use of technology assists the teachers in meeting their learning objectives. They perceived technology as helpful, but they still experienced some barriers. For example, one teacher stated: *“Technology can help me meet my learning goal based on the lesson plan, but I still have some student engagement problems. In this distance learning, students are lack engagement with the learning process, and there are a few exposures.”*

c. The Interconnection between EFL Teachers' Beliefs and ICT Integration Practices.

We employed the RAT framework to indicate how far the EFL teachers integrate ICT. The teachers' ICT integration shows in the level Amplification (See table 5).

Table 5

The Alignment Between Teachers' Beliefs and ICT Integration Practices

Subject	Beliefs Orientation	ICT Integration Level
Teacher A	Positive belief about ICT integration, high self-efficacy belief, student-centred belief	Amplification
Teacher B	Positive belief about ICT integration, low self-efficacy belief, student-centred belief	Amplification
Teacher C	Positive belief about ICT integration, high self-efficacy belief, and student-centred belief	Amplification

The level of teachers' ICT integration can be categorized into Amplification or middle grade because almost all participants used ICT to

increase their productivity and efficiency. However, they still faced some barriers, such as students' engagement. Besides, the learning was still incomplete; for instance, they missed the motivation or stimulation stage for their students. Regardless, it was merely focused on utilizing the ICT; the teachers could increase their productivity and efficiency.

The technology as amplification category focuses on technology use that amplifies current instructional practices, student learning, and content goals (Hughe et al., 2006). The teachers used technology to make learning more accessible and efficient. With regards to technology integration at the amplification level, there is no fundamental change in any themes—instructional methods, student learning processes, and curriculum goals. The focus is effectiveness or streamlining rather than transition (Hughes et al., 2006).

The level of ICT integration of the teachers incorporates with their beliefs orientation. However, overall, teachers' beliefs orientation were positive about ICT integration, high self-efficacy belief, and student-centred belief. Still, they could not reach the high level of ICT integration linked to creativity in teaching.

DISCUSSION

a. The EFL Teachers' Beliefs about ICT Integration

The study reveals that the participants had some beliefs through the teacher beliefs lens. They had positive beliefs about ICT integration, high self-efficacy beliefs, low self-efficacy beliefs, and student-centred beliefs. Teachers' beliefs can be seen as the "roof concept" for various beliefs. Teachers' beliefs about technology consist of three components: Self-efficacy beliefs for using technology, pedagogical beliefs, and beliefs about the value of technology use (Taimalu and Luik, 2019). The authors dichotomize each teachers' beliefs regarding technology. Self-efficacy beliefs for using technology consist of low and high self-efficacy. Beliefs about the value of technology use have two views: positive and negative. Pedagogical beliefs are divided into student-centred and teacher-centred orientation.

Another result is that all of the participants uttered their beliefs through thinking. Some participants stated that they thought, using the words 'I think.' It showed that their beliefs are part of knowledge contribution. It is in line with the previous study. Some researchers have stated that beliefs are a form of knowledge. Borg (2006) said that attempting to separate knowledge and belief is not a particularly fruitful exercise, given that these constructs are not viewed differently in the minds of the teachers. According to Zheng (2015), teachers' beliefs are "psychologically held thinking, conceptions, and understanding about teaching and learning."

Meanwhile, it is challenging to describe teachers' beliefs in clear terms because of the variety of ways described in the literature (Lim et al., 2013). Some researchers have argued between teachers' beliefs and knowledge (Zheng, 2015), and they have claimed that knowledge is perceived as intrinsically distinct from beliefs. For example, Verloop et al. (2001) distinguished beliefs from knowledge. Knowledge and beliefs are different concepts because knowledge is closer to the truth than beliefs. However, from the perspective of teachers' cognition, which is defined as the process by which teachers form ideas and concepts, knowledge and beliefs can be viewed as overlapping notions that are inextricably linked in the minds of the teachers.

b. The EFL Teachers' ICT Integration Practices

ICT integration refers to computer-based communication incorporated into the classroom's everyday teaching process (Ghavifekr & Rosdy, 2015). Rodríguez et al. (2018) defined ICT as the use of technology in classroom practice to provide explanations, use technical tools for students in the classroom, and include these tools in students' curricula by developing ICT that has been fully implemented. It requires e-skill to implement ICT optimally (Adegbenro et al., 2017). ICT encompasses all technology used, especially in education, to manage and communicate information (Lawrence & Tar, 2018).

To identify EFL teachers' technology integration, our study adopted Hughes's (2006) analytic framework in which technology was integrated and represented as three specific orientations in the level: Replacement,

Amplification, and transformation. Replacement takes place as the lowest stage or level in integrating technology. It shows that with the use of technology, aspects of students learning processes, instructional methods, and curriculum goals remained precisely the same with traditional teaching methods. Amplification is when aspects of students learning processes, instructional methods, and curriculum goals become more efficient and quicker with the use of technology. The last stage of the framework is transformation. It dealt with technology high-integrated when aspects of students learning processes, instructional methods, and curriculum goals were transformed in complex ways. Moreover, creativity in teaching and learning emerges.

The data presented that the teachers integrate and utilize various kinds of technology or ICT for the instructional method, students' learning, and curriculum goals. For instructional methods, teachers used technology to make activities such as making a lesson plan and checking students' attendance, giving instruction or information and communicating with students, collecting the score of students' tasks, and assessing students' work easier and quicker. Besides technology used for preparation, interaction with students, and assessment of students included in the instructional method, the teachers also applied technology for students' learning processes. Technology was utilized to make learning activities and task milieu effective. Overall, technology can assist teachers in reaching their learning objectives or curriculum goals. Hence, it can be categorized that the EFL teachers' integration level was at the amplification stage.

The technology as amplification category looks at how technology has enhanced current instructional practices, student learning, or content goals. The main effects are increased efficiency and productivity. A common belief is that computers improve our ability to perform traditional jobs by amplifying or extending our capabilities, with the idea that these tasks stay fundamentally the same. The phrase "amplify" means "to make more powerful," and "refers very precisely to the intensification of an acoustic or electronic signal that does not experience any changes in its essential structure (Hughes et al., 2006).

The Amplification provides more data for the long term related to student and school data. These may promote different levels of information for parents, and possibly other levels of communication, connection, and interaction between parents and school agents. Technology is affordable or used in the teaching process and strengthens the process. Teachers must have various skills to effectively use technology, including communication skills, team-building skills, and adapting to novelty because technology will constantly evolve with the times. Thus, the ability to adjust for teachers to develop the teaching process remotely is necessary (Mishra et al., 2016).

Another result showed that the teachers used ICT for many purposes. Almost all stages of teaching procedural have been assisted by technology. In line with Sipilä (2014), the result stated that many teachers reported using technology to address their professional and students' needs (Sipilä, 2014). For different purposes, teachers use technology to promote: (1) administrative or management practices, such as monitoring the grades of students, (2) conventional or based on teachers' educational methods, such as lecturing or presenting, and (3) promote instructional activities focused on students, such as offering students the option of how to show their learning (Li et al., 2018). Besides, if properly used, technology will increase learners' engagement and access to their target languages, provide more opportunities for interaction and input, and enhance the effectiveness of the organization of teachers and the presentation of teaching material (Golonka et al., 2014).

c. The Interconnection between Teachers' Beliefs and ICT Integration Practices

The findings show that the beliefs of EFL teachers have a close association with their ICT integration practices. ICT was integrated for effective and efficient learning, meaning teachers' level of ICT integration was amplified based on the RAT framework. It was related to the participants' beliefs that they had positive beliefs about ICT use for teaching and learning and student-centred belief orientation for pedagogical belief. However, one of three had low-self efficacy beliefs to

utilize ICT. Moreover, they still could not reach the high level of ICT integration linked to creativity in teaching.

The study aligns with Hsu (2016) and Ding et al. (2019). Hsu (2016) discovered that teachers who hold constructivist pedagogical beliefs about using technology put positive interest in the use of technology and had two or more high-level activities in their lessons. Furthermore, Ding et al. (2019) indicated that EFL pedagogical beliefs follow their technology integration practices.

The results of this study are in contrast with (Prestridge, 2012). Prestridge (2012) stated that teachers' beliefs in ICT integration increase creativity in teaching practice. ICT has merged with learning as a thought facilitator. With high beliefs, the teacher can read the situation to form new experiences for students in the teaching process. They were especially creating a learning model that is not boring for students.

CONCLUSION

Based on the research findings and discussion, the beliefs of EFL teachers have a tight interconnection with their ICT integration practices. ICT was integrated for effective and efficient learning, meaning teachers' level of ICT integration was amplified based on the RAT framework. It was related to the participants' beliefs that they had positive beliefs about ICT use for teaching and learning and student-centred belief orientation for pedagogical belief. However, one of three had low-self efficacy beliefs to utilize ICT. Moreover, they still could not reach the high level of ICT integration linked to creativity in teaching. They also faced some barriers in integrating ICT, such as students' engagement and the learning in the distance still incomplete. They missed the motivation or stimulation stage for their students, and the students' learning process was lack of speaking and listening enhancement activities.

However, this study provides valuable knowledge, but it is limited by the data objects available, which used three teachers as participants. The use of more than three people as participants will contain diverse data and more complete research results. Besides, to indicate the ICT level integration of teachers, the study merely focused on how they utilize ICT without

considering the content materials of learning, teaching methodology, and teachers' knowledge in detail. Suggestions for future researchers can be the use of more people as data objects to corroborate research results and teacher background whether it will affect EFL teachers' beliefs and ICT integration practices during distance learning.

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