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Investigating Science Student Teachers' Use of Instructional Technologies

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Abstract

The aim of this study is to investigate science student teachers' technology preferences and how they value technology in their teaching practices. This study employs the instrumental case study design which is one of the types of case study strategies. The study was carried out with the participation of eight volunteer science student teachers (3 males and 5 females) in the science education department of a state university in the spring term of the 2018-2019 academic year. Data were gathered by observing student teachers' actual teaching during teaching practice and collecting their documents from reflective journals and lesson plans. Data were analyzed inductively, using thematic analysis. The results showed that science student teachers used some technological tools categorized as instructional hardware, instructional media and instructional software during their teaching practice. The values that participating student teachers attributed to the tools used were two-fold: 'supporting the teaching process' and 'surviving in the classroom environment'. However, the study also showed that the participants mainly used technological tools in their teacher-centered activities.

INTRODUCTION

With the introduction of computer technologies into education, computer technologies are used mainly by teachers as a means of preparing plans, conducting searches for information, presenting information, preparing exam questions and communicating (Roblyer & Doering, 2007; Zyad, 2016) rather than being used for teaching purposes (Starkey, 2020). The projects that pave the way for the use of instructional technologies in schools lead to the use of smart boards in learning environments and the review of teacher competencies (Akyüz et al., 2014). With the widespread use of interactive whiteboards, the use of computer technologies emerges as a basic ICT (Information and Communication Technologies) competency for teacher candidates (Hammond et al., 2011; Kayaduman et al., 2011). Smart boards, which are used with programs that allow the use of teaching presentations such as formulas, pictures, maps, figures, animations and videos that can be used in teaching, also offer the opportunity to access various materials via an internet connection. These boards, which are seen as the combination of white and blackboards in the traditional classroom environment with computer technologies, are seen as one of the educational technologies that help improve the quality of learning and teaching (Jang ve Tsai, 2012; Roblyer & Doering, 2007).

Because educational technologies make learning environments interesting, increase permanence by appealing to more senses, make abstract concepts concrete and facilitate the teaching of difficult or dangerous situations, teachers are expected to use educational technologies such as mobile applications, augmented and virtual reality, robotics and coding, animations, simulations and Web 2.0 applications effectively during their teaching, (Jang, 2008; Wojciechowski & Cellary, 2013). Since science courses include abstract topics such as micro-scale heat and temperature, electricity and magnetism, these technologies are expected to be used in lessons to make what is learned concrete (MNE, 2018). With computer-based instruction, which includes interactive computer presentations, visuals such as graphics and pictures, videos, applications providing audio feedback and simulations used in the classroom environment, it is aimed to create curiosity in the learners about scientific subjects and to make learning fun (Güven & Sülün, 2012). In addition, the computer-based teaching method, which allows learning environments such as problem-solving, repetition and practice, simulation, animation and interactive presentations for expensive or dangerous experiments, contributes to making the achievements of the science course more understandable for students. This method is also used to gain positive perspectives toward science in addition to developing professional knowledge areas such as learning and consolidating content knowledge. Because of these gains and objectives, it is important to train equipped student teachers with technology skills and knowledge through teacher-training programs to meet expectations in the 21st century (Batane & Ngwago, 2017).

Research on the use of technology by teachers showed that teachers mainly prefer to make use of technology in a teacher-centered manner rather than student-centered activities (Hu & Yelland, 2017; Tondeur et al., 2012; Voet & De Wever, 2017). Hu and Yelland (2017) pointed out that when student teachers used technology in their classroom, they generally originated and directed the majority of the activities instead of letting their students find their way out. Voet and De Wever (2017) emphasized that since teachers generally see technology as a resource for their teaching activities rather than as tools students actively could use, they do not give students enough opportunities to use technology (Voet & De Wever, 2017). However, it is worth noting here that as Liem et al. (2014) stressed, the way students use technology is more crucial than how much they use these tools to utilize their problem-solving skills in their learning. This means that teachers' pedagogical reasoning and critical decision-making on the integration of technology into classroom teaching is crucial (Harris & Phillips, 2018; Hofer & Harris, 2019). For example, Hughes et al. (2020) also examined teachers' reasoning for using technologies and their results showed that student teachers designed mainly teacher-centered teaching activities rather than student-centered and their reasons to use technology in their teaching were about its potential presentational and engagement effects. However, they stressed that in-service teachers designed student-centered activities to support student learning through technology. Baek et al. (2008) identified six factors influencing teachers' choices of employing technology in their teaching such as 'adapting to external requests and others' expectations, deriving attention, using the basic functions of technology, relieving physical fatigue, class preparation and management, and using the enhanced functions of technology' (p. 228). They concluded that experienced teachers' decisions were affected by external forces while less experienced ones integrated technology into their teaching on their own will even though all tended to make use of technological tools.

In Turkey, the studies on the use of computer technologies in education are on various subjects such as the effect of technology use on achievement and attitude (Bilir & Uyanık, 2019; Dağdalan & Erol, 2017; Şahin & Namlı, 2019; Tekdal & Ilhan, 2021), student teachers'

and teachers' competencies in using technology (Gökal et al., 2020; Kocasaraç, 2003) and opinions of teachers or student teachers on using technology in their lessons (Bıçak, 2019; Çelik & Karamustafaoğlu, 2016; Timur & Özdemir, 2018; Yılmaz, 2020), self-efficacy (Simsek & Yazar, 2019) and tendencies (Tanık-Önal, 2017; Yenice et. al. 2019). It seems that studies of teachers' technology use in Turkey have been based on their statements or self-reported, which is a crucial limitation of the studies on this topic (Starkey, 2020). Considering that most of the schools have basic technological tools in place, investigating teachers' use of them in their classrooms will give more realistic information about how they value technology in their teaching. At the end, teachers are to decide the way to integrate these valuable tools into their teaching (Tsai & Chai, 2012).

The Purpose of Study

The aim of this study is to investigate science student teachers' preferences and how they value technology in their teaching practices. For this purpose, answers to the following questions were sought.

1. Which types of technology do science student teachers prefer to use in their teaching?
2. How do they value their use of technology in their teaching?

METHODOLOGY

Study Design

This study employs the instrumental case study design which is one of the types of case study strategies (Stake, 1995). As Creswell et al. (2007) stated, in the case study as a methodology within the qualitative research approach; the researcher explores a bounded case or cases over time through methodological triangulation (use of multiple data collection techniques). The purpose of this study is to investigate the type of technology that science student teachers use during their teaching practices and the value they attach to technology use. Therefore, the focus of this research is on their use of technology rather than the cases themselves; as Stake (1995) points out the cases selected are instrumental to provide insight into research concerns.

Participants

The study was carried out with the participation of eight science student teachers (3 males and 5 females) in the science education department of a state university in the spring term of the 2018-2019 academic year. The participants were volunteers to take part in this study and they were selected by using convenience sampling technique. The participants attended their teaching practice in the last semester of their teacher training program to form a basis for teaching experience under the guidance of two supervising science teachers and a university supervisor.

Data Collection

In this study, observation and documents (student teachers' reflective journals and lesson plans) were used as data collection techniques, further explained in the following part.

Observation: As Patton (2002) stressed, using observation in research provides the researcher with personal knowledge including his or her reflections and introspections during the data analysis process. In the current study, the participating science student teachers' teaching practices were observed across three different topics within science curricula. These observations provided opportunities for the researchers to describe the setting and to

understand the actual role and use of technology in the participants' teaching. As a marginal participant the researcher was in a passive role; that is, sitting at the back of the class, observing student teachers' teaching and taking field notes related to research concerns.

Reflective journals: Reflective journals are quite useful tools in educational research (Bashan & Holsblat, 2017; Phelps, 2005) and teacher training programs (Clarke, 2004; Phelps, 2005; Zulfikar & Mujiburrahman, 2018); that is, they are used as data collection tools in educational research and as tools to promote learning through their reflections. From the research perspective, reflective journals are valid tools to collect powerful qualitative data, the practitioners' insights that might be hard to document in using other methods of data collection (Phelps, 2005). Indeed, the reflective practice is part of teacher training, especially throughout the teaching practice (Cengiz, 2020). In this study, the participating science student teachers were asked to reflect on their teaching in an unstructured manner, regarding technological tools they used, their planning, methods, timing, class management and personal thoughts. Their journals were collected and stored for analysis. In gathering their reflections, the objective was to understand why and how they use technological tools and how they value their uses.

Lesson plans: A lesson plan is an organizer tool that teachers develop to map what should be taught and how this teaching would take place in the process throughout the course of time (Kubilinskiene & Dagiene, 2010). Here in this study the participants were responsible for preparing a lesson plan before each lesson they taught, which was a task for student teachers to master during their teacher training. Again, the objective of gathering data through lesson plans is to understand the purpose, role and stage of the participants' use of technology in their planned teaching.

Data Analysis and Trustworthiness in the Study

Data from different sources like field notes, lesson plans and reflective journals, were analyzed concurrently after data collection was completed. As a type of thematic analysis, inductive thematic analysis was employed in this study. Inductive thematic analysis is an iterative process of deriving meaning from qualitative data inductively through emerging themes (Braun & Clarke, 2006). In this study, to analyze the data Braun and Clarke's six steps were employed thoroughly. First, the data from all three datasets were read repeatedly and some comprehension notes were taken in the left margins of the text. This was the part of writing starting at this first stage of analysis and continued throughout the work, and the relevant chunks of data were colored at this stage. Doing this provided the researcher with a generic understanding of and familiarization with the whole dataset.

Second, the data were coded using the right margins of the texts, while remaining descriptive; that is, the extracts of data were coded at the semantic level rather than the latent level (Braun & Clarke, 2006). At this stage of the analysis, an initial code list or template was created as a result of both researchers' independent coding of the data obtained from the first case after a thorough discussion over the first level codes. Using this template for the next cases, the newly emerged codes were added to the code list or template with the same discussion process. The aim was to reach a framework which was the final version of the template. The framework was the end product of both researchers' coding and discussions. By doing so, seven first-level codes for the tools used by the participating student teacher and 19 first-level codes for the value the participants attached to their use of technology were identified. At this stage, both researchers also took some notes, including potential themes using the left margins again.

The third step in the analysis process was to search for the potential themes, taking the first-level code list or framework and left margin notes into consideration. This was achieved through collating first level codes into potential themes and selecting related extracts under each potential theme (Braun & Clarke, 2006).

Almost along with the third step, a theme map was created by reviewing the potential themes in the fourth step of the analysis process. Later, it was preferred to present this theme map as a table (Tables 1 and 2). At this stage, sub-themes and themes were determined and clarified.

The fifth step in the analysis includes naming and defining the themes. In order to ensure the theme map created in the fourth step, all datasets were reviewed in this step and it was ensured that the themes explained the structure within the data. At this stage, sub-themes and themes were named and the final version of the theme map was turned into a table.

And, finally a research report was produced under the themes and sub-themes that emerged in the study. At this stage, necessary associations were tried to be made in line with the objectives of the research and it was proved with direct quotations depending on analytical interpretations.

Researchers have taken some measures to ensure the trustworthiness of this study. Rather than calculating inter-coder reliability, the two researchers had discussion over the coded data, first-level codes, sub-themes and themes to ensure consistency until a full agreement was achieved. The two researchers' collaboration was in place throughout the whole research process, from designing the research process to reporting findings. It is worth noting here that the researchers have tried to be reflexive on their role throughout the study. The data collection process continued for an academic term, and the researchers were constantly present and communicating with the participants at school and at the university during this period. This prolonged involvement is an important measure to increase the credibility of research results (Lincoln & Guba, 1985; Denscombe, 2007). In this process, it was tried to provide participant control by giving feedback about the early evaluations of the collected data. This was an opportunity for member-checking, which is one of the crucial measures for the credibility of the study (Lincoln & Guba, 1985; Miles & Huberman, 1994). Using multi-methods to collect data was also a crucial measure for increasing both the credibility and dependability of the research (Lincoln & Guba, 1985). For proving the credibility and confirmability, the findings were supported by sufficient direct quotations from the participants in the study.

FINDINGS

In this section, findings are presented on which technological tools student teachers use during their teaching practices and what value they attribute to the use of technology. The findings obtained from the analysis of the data collected through the participating student teachers' lesson plans, reflective journals and observations are shown in Table 1 and Table 2.

Types of Technology Being Used in Teaching Practice

It is worth noting here that the aim of this part is to find answers to the first research question about what technological tools the participating science student teachers use during their teaching practice. The findings showed that science student teachers used technological tools in the categories of instructional hardware, instructional media and instructional software during their teaching practice. This categorical classification is based on Hughes et al. (2020) study.

Table 1. Technological tools used by science student teachers in their teaching practices

	Categories	Tools
Technological tools to be used	Instructional hardware	Smartboard
		Computer
		Printer
	Instructional Software	Drill and Practice
		Simulation
		Animation
	Instructional Media	Video
		Image

As seen in Table 1, the participant science student teachers frequently used the smart boards available in all classes in the instructional hardware category. In this category, it was also revealed that they used computers and printers especially in the preliminary preparations they made before teaching. It was observed that they used the worksheets they produced using these instructional hardware tools for evaluation purposes during their teaching. Data analysis revealed that the participants made use of animation, simulation and drill and practice applications which were classified under the category of instructional software. While the students participated in the teaching more actively in the drill and practice tools, the other tools were included in the teacher-centered practices. On the other hand, findings showed that the participating student teachers used images and videos which were classified under the instructional media category to promote students' learning.

The findings show that except for one student teacher, other pre-service teachers used technological tools in their teaching. However, this student teacher's reflective journal revealed her thoughts on the necessity of using technological tools after teaching as illustrated in the following extract:

> *If I taught the lesson one more time, I would benefit from the videos from EBA [Educational Information Network]. Students focus better on the information in the video (PST4, reflective journal).*

In the following part, findings about how the participants value their use of technological tools in their teaching were presented.

The Value Attributed to the Use of Technology in Teaching

The analysis of the data revealed the value that student teachers attributed to the use of technological tools in their teaching with two themes: 'supporting the teaching process' and 'surviving in the classroom environment'.

Table 2. Student teachers' values to use instructional technologies

Themes	Categories	Codes
Supporting teaching process	Increasing the efficiency of teaching	Reiterating Ensuring persistence Reinforcing Summarizing Visualizing Solving questions Evaluating Associating with daily life
	Enhancing students' learning interest	Motivating Attracting students' attention Arousing curiosity Making students think
	Presenting	Appealing to more senses Not understanding the drawing on the board Supporting the lecture Making things concrete
Surviving in the classroom environment		Avoiding wasting time Gaining time to cover the subject Spending time

Table 2 shows these two themes and their associated categories and codes.

Supporting Teaching Process

As can be seen in Table 2, it is revealed that student teachers mainly use instructional technologies to support their teaching process. This theme states that to improve their teaching quality, science student teachers use the opportunities offered by technology to support students' learning. Under this main theme, three categories emerged as enhancing learning interest, presenting and increasing the efficiency of teaching. These categories are detailed below, respectively, under subheadings.

Increasing Efficiency of Teaching

It is seen that the use of instructional technologies by student teachers was to support their teaching process to increase the effectiveness of their teaching. This category refers to the selection and use of appropriate technology in realizing students' conceptual learning. The participants think that reiterating, summarizing, using various assessment activities, visualization and associating with daily life will contribute to the permanence and reinforcement of students' learning.

Some student teachers stated that reiterating and summarizing would provide permanence and would be important in consolidating the subject. Reiterating and summarizing the topic being taught were achieved through making use of different technological tools. The following excerpts illustrate some student teachers' views on how they value the tools employed in their planning and actual teaching.

> *I think that summarizing the lesson by watching a video is effective in concretizing the subject (PST_3, reflective journal).*

> *I believe that students' learning was reinforced by watching the video of metamorphosis using the summary of the subject available in Morpa campus. By visualizing the topic, I ensured permanent learning in students (PST_3, reflective journal).*

It has been determined that student teachers generally use activities such as summarizing and reiterating the topic being taught during the elaboration phase of the course by using instructional technologies like video to reinforce what has been learned and ensure permanence as indicated in the following extracts:

> *I did not use a video to provide information in the explanation phase; I preferred to provide the information myself. I used the video as a reinforcer during the elaboration phase. I thought that the children would reiterate what they heard from me watching the video (PST_8, reflective journal).*

> *I preferred to use video to deepen the information and ensure permanent learning (PST_8, lesson plan).*

> *In the elaboration phase, I preferred to use video, that is, computer-assisted instruction, on the subject. I thought that this would reinforce students' learning (PST_5, reflective journal).*

> *I aimed to ensure permanence by using a documentary video about fish giving birth during the elaboration phase (PST_2, reflective journal).*

It is worth stressing here that the participating student teachers prepared their lesson plans considering the 5E learning model which was their own preference. However, their use of technology was mainly in teacher-led activities contrary to what is expected in the 5E learning model. On the other hand, in the evaluation phase of their lesson plan and actual teaching, it is aimed to reach more question types by using computer technologies, to solve questions and to increase the effectiveness of learning through evaluation activities as you can see in the following extracts:

> *I used the activities in EBA in the evaluation to reach various questions such as concept maps and filling in the blanks in the puzzle (PST_8, reflective journal).*

> *After completing the activities in the book, I used the activities I prepared from the smart board in evaluation (PST_7, reflective journal).*

> *In the evaluation, questions will be solved for practice purposes on electrically charged objects from Morpa campus (PST_5, lesson plan).*

It has been revealed that some student teachers used technology to increase the effectiveness of teaching through visualization as PST_1 stated:

> *I chose computer-assisted teaching in order to add appeal to the subject and to ensure better retention in their minds (PST_1, lesson plan).*

Finally, in the effectiveness of the teaching, it was determined that most of the participants benefited from computer technologies in order to associate the topics covered with daily life.

For example, PST_1 showed the students the events such as the formation of the rainbow and seeing the mirage by making associations with daily life after his own explanation of the topic refraction of light, through videos, expressing that:

> *During the elaboration phase, I will explain it on the board in a way they can understand and have them take notes in their notebooks. Then I will show you videos on the subject from EBA such as the formation of a rainbow, puddles on an asphalt road or under trees in the desert in very hot weather (PST_1, lesson plan).*

> *I think it [using technology] is good because it is effective in concretizing the lesson by watching the video… (PST_3, reflective journal).*

Enhancing students' learning interest

Within the scope of this category, student teachers stated that they used technological tools to attract students' attention. They stressed that they use some technological tools in teaching because of their features that increase students' motivation, attract attention, arouse curiosity and make them think.

> *In the introduction, I used a video because I thought videos would attract the attention of the students. I asked open-ended questions about the video (PST_5, reflective journal).*

> *To arouse curiosity, I showed the picture on the smart board to the class and asked them, 'What do you see in this picture?' My aim here was to make students think when they look at the picture, to arouse curiosity, to draw attention to the lesson and to provide motivation (PST_6, reflective journal).*

Although technological tools used to attract attention are generally preferred at the introductory stage, they are used to ensure students' motivation during the course as some participants stressed in the following extracts.

> *I will use videos and visuals to help them adapt to the lesson without getting bored (PST_1, lesson plan).*

> *If I had done the revision instead of using the video, the students would have gotten bored (PST_8, reflective journal).*

Presenting

Most of the student teachers stated that they used technology for the presentation of the content in their teaching. They stressed that visuals and videos appeal to more senses, that ready-made visuals are more effective than drawings made on the blackboard by the teacher, that they help to concretize events that cannot be observed in the classroom environment, and that they help support their own teaching. The majority of the candidates preferred instructional technologies because they appeal to different senses as can be seen in the following extracts:

> *In order to reinforce what I was telling, I showed them a video during the elaboration phase to make it appealing to the eye and ear (PST_8, reflective journal).*

> *I preferred to use video because it appeals to more sense organs (PST_8, reflective journal).*

PST_1 emphasized that they should benefit from computer technologies in order to provide students with a better version of the presentations they make in the classroom environment. While explaining the structure of the ear, PST_1 stated in her post-teaching reflective journal that the shapes he drew on the board could not be understood by the students because they were not very good, so he should benefit from instructional technologies, stressing that:

> *I drew on the board in the explanation stage but the students did not understand my drawings. This was also a waste of time. I had to benefit from the smart board (EBA) on this issue (PST_1, reflective journal).*

In addition to the different strategies and methods used by student teachers for their teaching, they used computer technologies and emphasized the aim of supporting their teaching by visualizing information as can be seen in the following extracts:

> *I employed an argumentation method during the exploring phase. After explaining the topic on the board during the explanation phase, I showed a video for real visual support (PST_7, reflective journal).*

> *In the explaining phase, I talked about the event and provided the missing parts. In this phase, I wanted to provide support by using a video on the subject... After the activity, I had the students take notes. The video supported the topic (PST_5, reflective journal).*

> *I showed by a video that lenses cause forest fires and that we should be careful. In addition, my explanations, I supported them with video and visuals and made them see the moment of fire (PST_3, reflective journal).*

Surviving in the classroom environment

While most of the student teachers preferred computer-assisted instruction to support the teaching process, some of them used it to overcome the difficulties they encountered in the classroom environment due to their first experience in teaching. They preferred technological tools for reasons such as using time effectively, filling time, saving time, and finishing the topic on time. It has been observed that candidates receive help from computer technologies in unexpected situations they encounter during teaching. For example, PST_1 stated in her reflective journals that the drawings she made on the blackboard took time; instead, it would be more beneficial to use the visuals on the smart board in terms of time. Class observations show that PST_2 uses computer technologies to fill the time in the remaining part of the lesson because he finished the topic unexpectedly early. Similarly, PST_6 applies instructional technologies to eliminate the problems encountered while performing its planned experiment on germination and PST_7 used the smart board for the remaining time because his activities end earlier than planned. The participants also explained these situations during their teaching in their reflective journals as can be seen in the following extracts.

> *I used question-answer and lecturing techniques in the explanation part. Additionally, I received support from EBA... There were problems in germination activity, but even if there were no problems, a clear result would not be obtained*

as germination would take 1-2 weeks. I overcame this situation by using a video from the first lesson (PST_6, reflective journal).

I didn't have any shortcomings for this course other than being a little late to the class. I got over this by finding an easy solution thanks to the smart board (PST_7, reflective journal).

On the other hand, the PST_2 did not turn on the smart board from the beginning, later in the lesson asked for help on this issue since she did not know what was in the videos. In her lesson plan there was no sign of computer assisted instruction on sexual and asexual reproduction topics, but since the lesson was explained and finished very quickly, she used videos in the exploration phase of the second lesson to cover the rest of the class time.

The findings show that all participating science student teachers, except PST_4, used computer-assisted teaching in their teaching practice and PST_1 and PST_6 used computer-assisted teaching methods in teaching other subjects except one. However, PST_4, who did not plan to use technology in her lesson plans, did not use technology at all during teaching, emphasized her thoughts on the need to include technological tools in teaching in her reflective journals after his teaching experiences as can be seen in the following extract:

If I were to plan the lesson again, I would make use of a video in the explanation phase. Students focus well on things in the videos (PST_4, reflective journal).

Findings show that the majority of participating science student teachers use technology to manage lesson time to survive in their first teaching experiences.

DISCUSSION AND CONCLUSION

This study, which aims to determine science student teachers' use of technology in their teaching practices and which value they attribute to technology, has revealed that the majority of student teachers include computer-assisted teaching in their teaching plans and practices. However, Batane and Nikivago (2017) stressed that student teachers did not use technology in their teaching activities even if they had the skills and knowledge to use different technological tools. In this study, only one of the participating student teachers did not include ICT in her lesson plans and teaching. She expressed her need for ICT use and the contributions of ICT to teaching after her teaching experiences in her reflective journals. This is similar to that of Tondeur et al. (2012) result indicating student teachers' use of technology depends on their motivation to integrate technology into their teaching, and thus some do and others do not. In the study of Tatlı et al. (2017) at the end of a training program, all student teachers emphasized the necessity of using technology in the classroom environment. However, their use of technology is mainly for presentation and communication. As Starkey (2020) stressed educators do not integrate technology into their teaching as expected from them even though they have the competence to use certain technologies.

Findings revealed that the participating student teachers who made use of technology in their teaching preferred to use tools such as drill and practice activities, animations, simulations, videos, visuals, smart boards, computers and printers. A similar finding is found in the study by Hughes et al. (2020). They found that student teachers use technological tools such as smart boards, printers, videos and visuals during their teaching, the in-service teachers, on the other hand use the drill and practice and animation tools within the scope of instructional software, not the in-service teachers. Similarly, in the study of Hammond et al. (2011), smart

boards were central to nearly all students' practices. This study also showed that the participating science student teachers made use of technological tools supporting their own teacher-centered activities during their teaching.

One of the emerging themes about the participants' value of their use of technology during their teaching was 'supporting teaching process', which includes three categories such as increasing efficiency of teaching, enhancing students' learning interest and presenting. The other theme is 'surviving in the classroom environment'. Similarly, in Ipek Akbulut's (2016) study, it was stated that science student teachers make use of technology as a means of supporting the teaching process through presentation, attracting student attention, and increasing teaching effectiveness. Baek et al. (2008) showed that the reason why teachers, most of whom are in primary schools and some are in secondary schools, use technology is not for the learning and teaching processes, but for the purpose of meeting the expectations of the students and the society. Johnston and Suh (2009) found that pre-service elementary teachers integrated technology into their teaching based on whether it was fun or not, rather than whether it supported conceptual understanding. However, in this study it was found that student teachers mainly use computer technologies for presentation purposes to support the teaching process, and this is common in different studies (Aslan & Zhu, 2017; Hughes et al., 2020; Polly, 2014). Hughes et al. (2020) stressed that the values teachers attributed to the technology use were about students' knowledge development while student teachers tended to value the use of technology as a tool for presentation and students' engagement. In this study, it was seen that some of the student teachers also use technology in teaching to survive during teaching as practitioners. Here, the participating student teachers expressed that technology is their life-saver when they have problems in planning lesson time, either to create time or to save time.

The themes that emerged as a result of the analysis of the data obtained within the scope of both research questions are more limited in terms of diversity compared to those revealed in the literature, but they overlap to a large extent. For example, in the Huges et al. (2020) study, student teachers and teachers used a wide variety of tools such as projectors, tablets, clickers, cameras etc. in addition to the tools revealed in this study. And they also used ICT for a wide variety of purposes, providing alternatives to hard copies, model lifelong learning and model a new learning culture. It is thought that this situation arises from the teacher-centered approaches adopted by student teachers in the use of technology. As a matter of fact, some studies showed that the use of technology in the classroom was generally teacher-focused and transmissive. For example, in the study of Tondeur et al. (2012), most of the teachers used technological tools such as data projector or interactive whiteboard to deliver instruction. This is because of teachers' perceptions of technology use in classrooms. They see technology as a resource in their teaching activities rather than a tool that supports students' own learning (Voet & De Wever, 2017). Another factor is thought to be that in the classroom environments the participants want to focus primarily on their own teaching in order to survive, and therefore they employ mostly teacher-centered technology use.

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