

TEACHERS' PERCEPTIONS OF THEIR TECHNOLOGICAL COMPETENCE IN LEARNING AND TEACHING PROCESS

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ABSTRACT

This study determines Turkish in-service teachers' perceptions of their technological competence in learning and teaching process. In the study, case study method was employed. The participants of the study consisted of 23 in-service teachers working in Turkey during 2019-2020 academic year. The questionnaire technique was used in obtaining the data. For this purpose, six open-ended questions were prepared. In the analysis of the data, content analysis was employed. The findings of the study showed that most of the teachers use technology in preparing the course content and presenting it to the students, for in-class and out-of class activities. It was also obtained that most of the teachers feel inadequate in using technology in education. Lastly, teachers indicated that online systems used during pandemic process enabled the continuity of education, provided opportunity for teachers to improve themselves, increased family support and provided flexibility.

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INTRODUCTION

In the information age we live in, technology has become an indispensable component of life and is used widely in various daily life actions such as transportation, shopping, communication (Lee & Spire, 2009). In addition, technology has transformed the societies and shaped the way people think, live, work and act (Grabe & Grabe, 2007). Developments in the information and communication technologies have dramatically affected the many fields including education (Liu, 2012; Wang & Woo, 2007), and necessitated the emergence of new teaching methods (Tezci, 2011). Within this context, schools have the responsibility for preparing the students for the growing demands of the technology (Ritzhaupt, Dawson, & Cavanaugh, 2012). As a result, technology has become a permanent part of education (Dougherty, 2012; Lowther, Ian, Strahl, & Ross, 2008), and schools are expected to adjust the education systems and curriculum in accordance with the increasing digital demands (Franciosi, 2012). As can be understood, schools are required to change their policies and focus on technology integration into learning and teaching process to equip the students with the skills required to keep up with the changing conditions and prepare them for future.

Technology integration in education refers to learning and teaching process in which educational technologies are utilized (Ghavifekr and Rosdy, 2015). However, technology integration does not simply mean having access to computers, internet, or technological devices. This process necessitates establishing creative and innovative practices to achieve intended learning outcomes (Davies & West, 2014). Integration of technology into education has taken the attention of education researchers due to its benefits such as

improving and increasing the accessibility, cost-efficiency, quality and delivery of instruction to the students (Tondeur, van Braak, & Valcke, 2007). In addition, when technology is utilized in education, teaching and learning and information resources are supported at higher levels (Albirini, 2006); learning has become more entertaining (Baydas & Göktas, 2016); and great contribution is made by leading to more effective learning and providing help and complementary support for both teachers and students (Jamieson-Procter et al., 2013). Moreover, it provides enriched learning environment, encourages knowledge construction in a more flexible environment (Sang, Valcke, Van Braak, & Tondeur, 2010). As seen, integration of technology in education has many benefits for both students and teachers.

Technology integration into the classes has been a focus in many countries around the world and huge financial resources are allocated for this issue (Liu, 2012). However, it is stated that there is no perfect system which fulfills the students' needs completely (Peeraer & Van Petegem, 2012). This issue has also gained attention in Turkey and has become one of the educational policies. The Republic of Turkey Ministry of National Education (MoNE) has conducted many projects on this issue especially for the last 30 years. It is aimed to develop information and communication infrastructure systems in schools across Turkey. Projects such as *"Basic Education I and II, e-school, e-learning portal"*, and recent *"FATİH project"* are among the projects carried out to support learning (MoNE, 2007). Based on these growths, various devices such as document cameras, interactive whiteboards, wired Internet connections are provided at schools (Baydas & Goktas, 2016).

Although, there are various projects to enhance technology integration at schools, it is obvious that the success of these devices and systems are mainly based on the competent teachers (Goktas, Yildirim, & Yildirim, 2008; Nelson, Christopher, & Mims, 2009). Within this context, teachers are expected to be equipped with adequate skills and be provided with the required training. However, it is stated that teachers cannot use technology in education at desired levels and acceptable standards (Sipila, 2014). It is also explained that teachers are not trained properly and enough to effectively integrate technology into their classes (Karchmer-Klein, 2007). On the other hand, teachers should plan and create effective technology based learning environments and experiences. In addition, supporting the diverse needs of students in a technology-enhanced environment, providing appropriate learning opportunities and applying various technology-enhanced instructional strategies largely depend on whether teachers have the required skills (Perkmen, 2008). As can be understood, teachers have a key role in successfully integrating the technology in the classes. Therefore, they should have the relevant skills and be trained enough.

There are many factors affecting the successful integration of technology into the classes. Among them, personal factors related to teachers such as motivation and perceptions of teachers about technology, their pedagogical beliefs, attitudes towards technology use and integration (Thomas & Vale, 2003; Baek, 2008; Kafyulilo, Fisser, & Voogt, 2016) are prominent. When teachers have self-perceived lack of competency and knowledge with technology, they cannot build self-confidence towards using technology (Kim, Kim, Lee, Spector, & DeMeester, 2013). An and Reigeluth (2011) emphasized that the anxiety of teachers prevents them to use technology in the classroom effectively. Additionally, some other factors such as ability, knowledge of the teachers (Markauskaite, 2007); school climate (Albirini, 2006); support of administrators and colleagues for teachers (Levin and Wadmany, 2008) have a key role in successful technology integration. As can be understood, many factors are influential in successful and effective use of technology in education and it can be said that teachers play the key role in integrating technology into educational field and they are the determinant of the success of this process.

The effective technology integration can be accomplished by building a balance between teachers' knowledge of content, pedagogy and technology. Teachers should know how to fit these areas together meaningfully (Koehler & Mishra, 2008). Based on this, it is argued that teachers should have knowledge on technological pedagogical content, pedagogical and technological issues. Content knowledge is the knowledge related to the subject matter to be learned and taught. Pedagogical knowledge covers the aspects of teaching, learning, curriculum and assessment. Lastly, technological knowledge is related to the knowledge on computers, tablets, interactive white boards, and smartphones and how to use them (Snyder, 2014). Therefore, it can be concluded that although affective factors such as teachers' motivation, attitudes,

confidence are important for effective technology integration, they are not sufficient. In this process, teachers' knowledge level regarding technology has also significant value.

It has been found in some previous studies that teachers' knowledge and skills in technology have great impact on their use of technology in teaching and learning process (Aydın, 2013). Lawrence and Tar (2018) stated that teachers' competence and their attitudes are determinant in the use of technology in the classes. Similarly, Buabeng-Andoh (2019) emphasized that teachers' competence in using computers and technological devices increase their technology integration level in the classes. Pelgrum (2004) indicated that for the successful implementation of technology integration, teachers should have competence in using the technology. Sipila (2014) found that teachers' competence level in technology use influences their technology integration. Arslan and Zhu (2017) indicated that teachers' competence determine their integration of technology into teaching process. Based on the information in the literature, it can be concluded that teachers should have the required knowledge, and be competent in using the technology. On the other hand, Covid-19 pandemic process has brought various disruptions to all spheres of human life. Education is also affected dramatically and online education systems have been adopted by different countries. As a result, online education has become a must and education has shifted from face to face education to online classroom environment, which has increased the importance of technology integration further. For the high quality of online learning process, teachers have the key role. Therefore, teachers' opinions and their experiences should be examined in detail. Within this context, the current study aims to determine Turkish in-service teachers' perceptions of their technological competence in learning and teaching process. More specifically, this study tries to uncover the factors that might affect in-service teachers' use of technology in teaching process. In light of this information, the following sub-problems were tried to be answered:

- What is the technology usage level of teachers in preparing the course content and presenting it to the students?
- How and for what purposes do teachers use technology in conducting in-class and out-of-class educational activities (homework, projects, internships, etc.)?
- How and to what extent do teachers use technology to assess and evaluate students' performance?
- Which problems do teachers face when using technology in teaching and learning processes?
- In what ways do teachers consider themselves sufficient or insufficient in carrying out these processes?

RESEARCH METHOD

Research Model

In the study, case study method was employed. Case study research focuses on one or more cases. In case studies, it is aimed to provide in-depth understanding by conducting data analysis of multiple sources of information used for describing all details of the case (Creswell 2013). In this study, the case is determined as Turkish in-service teachers' perceptions of their technological competence in learning and teaching process.

Participants

A total of 23 in-service teachers working in Turkey during 2019-2020 academic year took place in the study. In the selection of the participants, convenience sampling method was used. In convenience sampling method, *"members of the target population who meet certain practical criteria such as easy accessibility, geographical proximity, availability at a given time, willingness to participate are included"* (Etikan, Musa, & Alkassim, 2016). Of these teachers, 15 (65%) were female and 8 (35%) were male. 5 (22%) of the teachers had 1-5 years of work experience, 8 of them (35%) had 6-10 years of work experience and 10 of them (43%) had 11 years and above work experience. 8 of the teachers (35%) stated that they had online classes before.

However, 15 of them (65%) stated that they did not have online classes before. In terms of education level, 11 of them (48%) had a bachelor degree while 13 of them (52%) had master degree. 2 of the teachers (9%) stated that they never use technology in education, 4 of them (17%) stated they rarely use, 14 of them (61%) stated they frequently use and 3 teachers (13%) stated that they always use technology in education.

Data Collection Tool

In order to find answers to the problems of the study, the questionnaire technique was used. For this purpose, six open-ended questions were prepared for the teachers by the researchers with the aim of determining teachers' technology usage level. Before preparing the questions, a detailed literature review was conducted and a framework was created. In addition, opinions and suggestions of an expert in the field of curriculum and instruction were taken. Therefore, the question form was prepared in a way to reflect the purpose of the study. In addition, it was tried to include questions that enable teachers to express their views in detail. The questions were also checked in terms of suitability, clarity and comprehensibility. As a result, the questionnaire was finalized and sent to the teachers via e-mail. The answers of the teachers were also taken via e-mail.

Data Analysis

The findings obtained from the interviews were analyzed by content analysis method. Content analysis is a method used to make valid inferences from the data obtained in accordance with the content. In content analysis, the aim is to obtain a comprehensive and broad definition of the phenomenon under consideration (Elo and Kyngäs, 2008). In this process, firstly, the codes were determined and then based on the obtained codes, themes were created. The answers of teachers to each question were examined in detail. Similar statements were grouped together and based on the opinions emerged, meaningful codes were created. The similarities and differences between coded data were examined and the codes that were related to each other were brought together. In this way, the codes were grouped under the themes. In addition, the obtained codes and themes were presented to a field expert in the educational science and a consensus was reached.

Validity and Reliability

In the study, to ensure the validity, the obtained data were given with direct quotations without making any changes on teachers' views. On the other hand, researchers first reached a consensus on the codes and the themes, and then the determined themes and coded were examined by a field expert. Therefore, the reliability was tried to be ensured. The data collection process was presented in detail. The names of the teachers were not explicitly given in the findings part, but were coded as T1, T2,... The participants' characteristics and research process were clearly defined and associated with the findings of other studies.

FINDINGS

This section presents the findings of the study in accordance with the sub-problems.

Opinions of Teachers on Their Technology Usage in Preparing and Presenting the Course Content

The first-sub problem of the study aimed to determine the opinions of teachers on their technology usage in preparing and presenting the course content. The obtained findings showed that most of the teachers (f=20) utilized from technology in preparing the course content and presenting the course content to the students. However two teachers stated that they do not use technology in this process. The opinions and the frequencies are presented in Table 1.

Table 1: Teachers' Opinions on Their Technology Usage in Preparing the Course Content

Teachers' Opinions on Technology Usage in Preparing the Course Content	n
Yes	21
No	2

Most of the teachers (f=21) stated that they used technology in preparing the course content. The teachers also stated that they used EBA, smart boards, videos, pdf files, YouTube, etc. in preparing the course content. For example, T1 stated; *"I send students videos or prepared tests. I also convert the tests that I prepared to Google form and send them to the students from the class via WhatsApp group and the EBA system."* T2 said, *"I use presentations, pdf files, audio files, videos, interactive games, etc. prepared by my colleagues."* T3 expressed his ideas as; *"I especially use digital resources prepared by educational sites which allow me to save time and access professionally prepared content for free. These contents, which I use while planning the lesson, generally consist of slides, animations and videos."* Similarly T4 said; *"I use technology frequently. I often use video and animations since they attract the attention of children more."* The other opinions stated by the teachers are as follows: *"I often use resources such as EBA, Morpa campus, school, etc. for preparing the course content."* (T5). *"Various digital sources are used to create the course content/transfer it to students. EBA (Education Information Network) and Interactive Boards are the most used digital resources. In the field/department courses, educational software or licensed programs (AutoCAD, Solid Cam etc.) are used according to the curriculum of the course."* (T8) *"I use smart board in the classes to make learning more effective and enjoyable."* (T12) *"I use digital sources in general. I start an activity mostly on smart board for students."* (T14) *"I provide digital resources from the sites as Facebook, etc."* (T20) *"I use the resources of sites such as teamelt etc. in online environments."* (T23).

On the contrary two teachers stated that they did not use technology in preparing and presenting the course content. T16 expressed her ideas as; *"I have never used digital resources in my classes."* Similarly T18 said; *"I do not use digital resources."* Therefore, it can be concluded that teachers participated in the study use technology actively in preparing the course content.

Opinions of Teachers on Their Technology Usage in Carrying out Educational Activities (homework, project, internship etc.) Inside and Outside the Classroom

In the second sub-problem of the study, it was aimed to determine whether teachers use technology in carrying out educational activities such as homework, projects and internship. The opinions and the frequencies related to this sub-problem are presented in Table 2.

Table 2: Teachers' Opinions on Their Technology Usage in Carrying out Educational Activities (homework, project, internship etc.) Inside and Outside the Classroom

Technology Usage in Carrying out Educational Activities		n
Intensive Usage	For in-class activities	7
	For homework	4
	For project assignment	3
	For field trips	1
	For internship	1
	For revision	1
	For sharing information	1
Limited Usage	Internet Access Problems	5

As seen in Table 2, teachers use technology in carrying out in-class and out-of-class educational activities for various purposes. Firstly, teachers stated that they use technology in various in-class activities. For example, T4 said; *"In class I often make use of smart board and educational websites in teaching."* T5 stated; *"I can only use technology for in class activities. I use smart board for experiments, in solving the*

questions.” T7 indicated; *“In order to increase students’ interest and motivation, I make use of websites specially designed for the English lesson. So, I generally use technology for in class activities.”* T9 said; *“During the classes, I use EBA contents.”* T10 expressed his ideas as; *“I frequently benefit from digital resources. I use smart board in the class; I use the electronic resources and the EBA (educational information network).”*

On the other hand some teachers (f=4) indicated that they use technology for giving homework to the students. On this issue, T1 stated; *“I use technological platforms for giving homework to the students. Students solve tests using these platforms.”* T8 said; *“I use educational technologies for giving homework. Especially in academic courses, assignments are made by using EBA contents and these assignments are followed.”* T9 indicated; *“I use homework tasks of EBA.”* T14 indicated; *“I want students to do their project assignments in the form of presentations.”* Similarly, T17 said; *“I want students to do their homework and in different ways with different animations. Students have fun doing their homework.”*

Three teachers said that they use technology for giving projects. On this issue, T2 said; *“When I give project assignment to the students, I utilize from technology. I want students to prepare the presentations in digital environments and present them to their friends in the classroom. So I use technology in the project assignments for evaluation purposes. Also, I use the interactive books compatible with the smart board in the classroom to make the lesson more visual and understandable.”*

On the other hand, teachers indicated that they use technology for field trips, internship studies, for reinforcement and sharing information. For example, T4 said; *“I use the smart phone to record videos and take photos in activities outside the classroom, mostly in trips and outside experiments. I usually use technology to access information and record.”* T6 stated; *“I share information and activities via WhatsApp.”* T8 indicated; *“Internship studies are carried out practically in the enterprises, and students learn the technologies of the field and use these technologies.”* Finally, T11 expressed his ideas as; *“I use technology for students to revise the subjects that students learned. I do not use technology when teaching a new subject.”*

On the contrary, five teachers stated that they do not use technology much due to internet access problem. For this issue, T2 said; *“There are some disadvantages to working in the small schools. Sometimes, I face internet access problem or sometimes internet connection is very slow. So, I have difficulties in using technology in making preparations for students or accessing the information needed in the class.”* T5 indicated; *“Most of my students do not have a computer. Internet access at home is also very limited. So, I cannot use technology actively in giving homework to students or for their project works.”* T15 said; *“I cannot use technology much in this process.”* Similarly T18 indicated; *“I do not benefit from the technology for in class and out class activities. Internet access is a big problem.”*

As can be understood, teachers use technology in carrying out educational activities such as homework, projects and internship. Teachers use technology mostly for in-class activities. However, internet access poses problem for some of the teachers and this problems prevents them from using technology effectively.

Opinions of Teachers on Their Technology Usage for Assessment and Evaluation

The opinions of teachers on their technology usage for assessment and evaluation were determined. The answers of the teachers on this question revealed that teachers used technology in preparing tests for evaluation, assessing the student’s level or progress. The opinions and the frequencies are presented in Table 3.

Table 3: Teachers' Opinions on Their Technology Usage for Assessment and Evaluation

Technology Usage for Assessment and Evaluation		n
Yes	For tracking	8
	For preparing exams	6
	For sharing information	3
No	No Usage	6

As can be seen in Table 3, teachers stated that they generally use technology for tracking the students' improvement level and to control whether students do their homework or not. For example, T1 said; *"We can track the status of the homework and tests that we sent to the students through the study reports section in EBA. But I do not make any assessment or measurement on this."* T2 indicated; *"In this epidemic period, students study the subjects on EBA. I can see the percentage of students on completing the tasks and the success rates of the contents we send to our students. I'm going to use this success rate as a performance grade."* T8 said; *"EBA is the leading technology used to measure and evaluate students' performance. In EBA, performances of homework given to students are measured."* Similarly T9 said; *"In measurement and evaluation stage, I can view the reports of the homework I have sent. Other than that, I do not use it in measurement and evaluation phase."*

On the other hand, some teachers stated that they use technology for preparing exams. On this issue T3 said; *"I always use technology to develop tools for assessment and evaluation or to access measurement tests which are valid and reliable. However, I do not use technology for evaluating students' success directly."* T5 indicated; *"I have access to question types from different sources and use them in assessment and evaluation studies."* T10 expressed his ideas as; *"I track students' studies and homework I give via EBA."* Similarly T13 indicated; *"I use websites for preparing questions for the students."*

Teachers said that they use technology to make online exams. For example T4 said; *"Especially at the end of each lesson or at the end of the day, I make use of various assessment and evaluation activities in educational sites such as school, morpa campus, using the smart board in the classroom."* T7 indicated; *"I try to evaluate the level of students' learning about the subject through online competitions on websites."* T20 said; *"In the course, I grade students by solving tests from online sites."*

On the contrary four teachers stated that they do not use technology for assessment and evaluation. For example, T15 said, *"Since the course content is not suitable, I cannot use technology for assessment and evaluation."* T16 indicated; *"I do not benefit from technology in assessment or evaluation."* T21 expressed her ideas as *"I haven't made measurement and assessment by using technology yet."* T22 said, *"I do not use for assessment and evaluation."* Lastly, T23 expressed her ideas as *"I don't use technology for assessment and evaluation."*

Opinions of Teachers on the Difficulties They Experience in in Using Technology for Educational Purposes

In the fourth sub-problem of the study, the difficulties teachers experienced in the implementation of the processes of using the technology in preparing the course content, its transmission to students, in-class and out-of-class activities, assessment and evaluation were explored. The opinions and the frequencies are presented in Table 4.

Table 4: Teachers' Opinions on the Problems They Experience in Using Technology for Educational Purposes

Difficulties Experienced by Teachers		n
Problems Experiences	Technological problems	14
	Student related problems	4
	Teacher related problems	4
	Family related problems	4

The main problem indicated by teachers is found to be internet access problems. On this issue, T3 said; *"The main problem I have experienced in the school is that the internet access is very slow. Also, inadequate technological infrastructure of the school negatively affects this process."* T5 indicated; *"The biggest problem I have is the lack of computers and internet access problem. I have 18 students. My students (5 people) who have financial difficulties do not have the opportunity to attend synchronous classes."* T7 indicated; *"In the classes, smart board does not work, there is no internet (disconnecting constantly) and students are not ready to learn digitally. Outside the classroom, it can be said that students do not have digital tools or internet connection."* The other opinions on this issue are as follows: *"There is not internet access in each class. Or, there may not be any smart devices or internet in each student's home. And projection or smart board of each class may not work."* (T10) *"Since it is a village school, there is internet problem, so I cannot use technology very much."* (T16) *"Some students do not have tablets and their family income level is low."* (T19) *"Internet access is a big problem."* (T22)

On the other hand, some teachers stated that they experienced student related problems such as motivation problem, not studying for the given content, etc. For example, T1 said, *"The main problem I have is that the students do not use the content we have prepared. For example, I sent the test I prepared to all classes via WhatsApp and EBA. Only 30 of the 150 people completed the test during the time I wanted."* T10 said; *"Students do not participate in online courses."* T11 indicated; *"Students are demotivated and they do not attend the synchronous classes."* T14 expressed her ideas as; *"Since students are not used to using technology in the learning process, there is an adaptation problem."*

Some teachers (f=4) stated that they felt inadequate in using technology and they needed in-service training. On this issue, T2 said; *"I sometimes have trouble in preparing digital content. An in-service seminar can be useful."* T3 stated; *"Another negative effect is the lack of in-service training activities to recognize and use the ever-evolving and changing educational technology."* T4 indicated; *"I need technological support and sometimes I get help from my colleagues. Not knowing how to use some applications sometimes causes me difficulties."* T10 said; *"Creating content is the biggest challenge, because we were not received a training to create content in digital platforms."*

Lastly, three of the teachers expressed family related problems they experience. For example, T8 said, *"Families do not provide adequate support."* T5 indicated, *"I have problems with families. They do not help their children. Also, some families are not interested in whether their children do their homework or not."* Similarly, T22 said; *"We expect families to help us in this process. We want them to check whether their children do their homework. But families do not provide support and help us."*

Opinions of Teachers on Their Competency in Using Technology for Educational Purposes

The fifth sub-problem of the study aimed to determine to what extent teachers find themselves adequate in using technology for educational purposes. The opinions and the frequencies are presented in Table 5.

Table 5: Teachers' Opinions on Their Competency Level in Using Technology for Educational Purposes

Opinions on Competency Level	n
Inadequate	14
Adequate	8

As seen most of the teachers consider themselves inadequate in using technology for educational purposes. For example, T1 said; *"I am not very active in the process, I am insufficient to create different content other than homework and test."* T2 indicated; *"I think I have shortcomings in creating digital material. I am sufficient to use and apply existing content."* T8 emphasized; *"I do not have enough information about digital education content and course material preparation."* T10 said; *"I feel inadequate on creating digital content."* Similarly, T11 indicated; *"I'm inadequate in following the newly developed technologies."* T12 stated, *"I'm insufficient in technology. I cannot solve the problems when I have problems with technological device."*

On the other hand, some teachers expressed that they considered themselves adequate in technology use for educational purposes. For example, T5 said; *"In this process, I had no problem using EBA application, preparing content, processing lessons and preparing homework. I am sufficient on these issues."* T7 indicated; *"I consider myself sufficient to use technological tools. In this way, I think that the students are more willing and excited about the lesson."* T9 emphasized; *"I know what resources I can use because I follow developments."* T19 said; *"I can use all kinds of technological tools."*

Positive and Negative Experiences of Teachers during Pandemic

In the last sub-problem of the study, it was aimed to determine the positive and negative experiences of teachers during pandemic. The opinions and the frequencies are presented in Table 6.

Table 6: Positive and Negative Experiences of Teachers during Pandemic

Positive and Negative Experiences		n
Positive experiences	Continuity of education	6
	Teacher Improvement	3
	Parental Involvement	3
	Increased Student Motivation	3
	Flexibility	2
Negative Experiences	Technological Problems	14
	Lack of Student Participation	4
	Lack of Student Motivation	3
	Lack of Family Support	2
	Lack of Administrative Support	1

Teachers mentioned about their positive and negative experiences during pandemic process. It is seen that students were happy since they could have online classes during this process, which enables the continuity of education. For example, T1 said, *"It is good or both teachers and students to continue to the education. Students ask their questions and we can help them. So, education is not interrupted."* T2 indicated; *"I created WhatsApp group and it is a great experience to be able to interact with my students and to be able to solve questions with my students as in face to face education."* T10 expressed his ideas as; *"I had the opportunity of solving a lot of questions with the students who have difficulties. I could connect with the students individually and they could ask about the items that they have difficulties in understanding. So, as face to face education, the process was carried out."* T12 expressed her ideas as; *"Thanks to the online systems, we could teach, so we could follow the curricula."* Similarly, T13 said; *"With the help of the system we used, we could go on teaching."* Lastly, T23 said; *"The continuity of education is important. It was a positive factor not to disrupt the teacher-student relationship."*

On the other hand, some teachers expressed that this process helped them learn new systems and improve themselves. For example, T3 said; *"I believe that this process enabled teachers to learn more. I could not use some systems before. But during this process I had to use them. So, I learned how to use them."* T5 said; *"I had the opportunity to improve myself in using technology. Under these conditions, online education became a must. So, I learned how to use technology better."* T7 indicated; *"This process provided me learn new things and improve myself."*

Three teachers expressed that in this process parents played key role on the success of the students. So, the parental involvement increased. For example, T1 said; *"The process showed that families who are interested in their children increase the success rate of the students. In this process, I saw that parents become more involved."* T10 stated that; *"I kept in touch with the families all the time. Some families were very interested. They were very helpful and they tracked the progress of their children in the system."* In addition, T22 indicated; *"In this process some families were very interested. They asked many questions about the system and tried to learn what they could do to contribute to the success of their children."*

Three teachers indicated that in this process students' motivation increased. For example, T4 said; *"We could communicate with students and as students became more involved in the process, their motivation increased."* T14 said; *"As the students learned the system better, their motivation increased and they started to ask more questions."* Lastly, T15 mentioned; *"The adaptation process was difficult, but in the end, more students attended to online classes and I can say that their motivation increased."*

On the other hand two teachers were in the opinion that the online system provided great flexibility for both students and teachers. For example, T8 said; *"It allows more students to access more data at the same time. It provides flexibility for students."* T15 indicated that; *"We used online systems during this process. So, we have more time to make preparation. Also, we can answer the questions of the students any time during the day. So, we are more flexible compared to face to face classes."*

On the contrary, teachers expressed their negative experiences during the pandemic process. First of all, teachers mentioned about technological problems they had. On this issue, the opinions of teachers are as follows: *"Unfortunately, a large number of students cannot participate. They also say that they cannot make connection through the system or some of them do not make such an effort."* (T1) *"During the online classes via EBA, I experienced system-related problems. Sometimes it takes longer to make connections."* (T2) *"In this process, I have online classes via EBA, but during the first 2-3 weeks, both me and my students had problems in making connection. Especially families who do not have internet connection at home could not make online lesson connection using their smart phones. This situation caused almost half of my students to be deprived of the online lesson. It was difficult for me to constantly inform and explain the parents about this issue."* (T4) *"I could not have online classes due to internet problem. In sending some videos, pdf stories, and activities via WhatsApp, some families experienced communication difficulties due to the lack of internet."* (T6) *"One of the biggest disadvantages of the process is that there are students who want to attend online lessons and who cannot participate in the process due to lack of internet connection and suitable digital tools (tablets, etc.)."* (T7) *"There was less participation in my class as most of the children did not have internet."* *"The most criticism from the students was about the lack of computers, so I had many students who could not attend the classes."* (T21)

Another problem faced by teachers was that students did not attend to online classes. For example, T10 said; *"Students do not attend the classes regularly."* Similarly, T14 indicated; *"Student attendance rate is very low."* T11 said, *"Students do not attend the online classes. They always have some excuses."* Lastly, T22

expressed her ideas as; *"The attendance rate is very low. Students don't attend the classes and don't do their duties. And, there is nothing to do with the students who don't want to attend the online classes."*

Some teachers stated that students were demotivated during this process. T7 said; *"I saw that most students could not adapt to this process. Especially, the fact that most parents did not support this process caused the students to decrease their motivation levels."* T8 indicated; *"In distance education, it is necessary to make more efforts to follow up students and motivate them."* T12 said; *"Students are not motivated to learn. They say they don't find online classes affective. So, it becomes difficult to increase their motivation."*

Teachers also mentioned about lack of family support as a big problem. For example, T1 said; *"Some families are very uninterested. So, we cannot get support from them."* T16 said; *"Most of the parents did not support this process. I gave the necessary information, but in the end, participation and interest were very low. This process would have been better if parents were supported and acted responsibly."* Lastly, T4 indicated that they could not get support from the administration during this process. She indicated that; *"We could not get support from the school administration. When I had connection problems, they could not find a solution."*

DISCUSSION AND CONCLUSION

In this study, it was aimed to determine in-service teachers' technology usage level for educational purposes. The first sub-problem of the study aimed to determine the opinions of teachers on their technology usage in preparing and presenting the course content. Most of the teachers (f=21) stated that they use technology in preparing the course content and presenting it to the students. On the contrary, two teachers stated that they do not use technology in this process. Therefore, it can be concluded that most of the teachers participated in the study use technology in the classes. Similarly, Winter, Costello, O'Brien, & Hickey (2021) found that teachers use technology regularly and have a good level of skill in using a wide variety of programmes and apps. In the study conducted by Kaarakainen and Saikkonen (2021) the participant teachers indicated that they use digital devices on a weekly or daily basis. However, 2 teachers stated that they use digital devices in teaching only occasionally. Integration technologies in the classes increase the amount of learning opportunities and provide enriching learning environments (Courville, 2011). As a result, it can be concluded that technology usage for educational purposes can lead to an effective and meaningful learning. Based on this, teachers should be encouraged to use technology more and they should be supported.

Within the second sub-problem of the study, it was aimed to determine to what extent teachers use technology in carrying out in-class and out-of-class educational activities for various purposes. The findings showed that teachers use technology for in-class activities, for giving homework, for project assignment, for field trips, for internship, for revision and for sharing information with students. On the other hand, five teachers stated that they do not use technology much due to internet problem. The recent studies show that teachers use computers frequently for making preparations. However, they use computers only once or twice a year for instructional purposes (Russell, Bebell, O'Dwyer, & O'Connor, 2003). Teacher should use technology for educational purposes more to provide diverse resources with high quality for student. Therefore, the problems preventing teachers in using technological resources should be determined and the necessary steps should be taken.

The third sub-problem of the study explored to what extent teachers use technology for assessment and evaluation purposes. Teachers stated that they use technology for tracking the students' progress, for preparing exams and for making online exams. However, six teachers said that they do not use technology for assessment and evaluation. In online platforms, teachers can provide feedback and guidance to students easily. In addition, teachers can track the students' progress, which leads to more targeted and more effective

guidance (Bowen, Chingos, Lack, & Nygren, 2014). Similarly, Gilbert (2015) indicated that online systems can be utilized for rapid feedback and student tracking. As seen, using technology for tracking the students' progress is considered as appropriate.

The problems experienced by teachers while using technology for educational purposes were examined. Teachers mentioned about technological problems, student related problems, teacher related problems and family related problems. Ertmer (1999) stated that lacks of hardware, software, training or technical skill are classified as first order barriers in technology use in education. In their study, Tarman, Kılınç and Aydın (2019) found that external obstacles, such as the lack of an effective computer lab. are most highly identified barriers in technology use in education. Dede (2011) emphasized the importance of sufficient technological and physical infrastructure to integrate the technology into education successfully. On the other hand, Okita and Jamalain (2011) stated that infrastructure, content, pre-service and in-service training, incentives, and harmony between technology and curriculum should be handled together for an effectively working system. Therefore, governments should make investments in educational technology to a successful conclusion (Atabek, 2019). In addition, slow internet connection is indicated as one of the major barriers faced by teachers (Carver, 2016; Göktaş, Gedik, & Baydas, 2013; Nikolopoulou & Gialamas, 2015; Salehi & Salehi, 2012). It is clear that technological problems are barriers for effective online classroom environments. Therefore, infrastructure should be improved and internet access should be increased.

Teachers also mentioned about some student-related problems. Among these problems, lack of motivation and low attendance rate to online classes are prominent. Self-regulation and motivation are among two critical factors for determining success in online courses (Matuga, 2009). Students who lack self-motivation have lower success rate in online classes (Savenye, 2005). On the other hand, in online learning environments, when students are not present, they have difficulties in producing the same results compared to the ones who attend the classes (Archambault, Kennedy, & Bender, 2013). As a result, for the success of students in online classes student's attendance and motivation are important factors. Therefore, students' awareness about the importance of attending the classes should be increased and they should be given the required guidance and assistance. In addition, teachers should try to increase students' motivation by taking their needs into account.

Teachers also stated that family support is important for the success of online classes. Abrami and Bures (1996) emphasized the importance of parental support in distance education systems. They also stated that students can feel isolation, lack of self-direction and management. Some students do not have self-discipline, ability to work alone, learning independently, and developing plan to complete the works. So, these students need support to be successful in distance education systems (Ludwig-Hardman and Dunlap, 2003).

The fifth sub-problem of the study determined whether teachers feel adequate or inadequate in integration technology into the classes. The findings revealed that most of the teachers felt inadequate. For successful technology integration, teachers first should be equipped with the required skills (Tarman, 2016). In this process, beliefs, attitudes and knowledge of teachers have a key role (Andrew, 2007; Kim, Kim, Lee, Spector & DeMeester, 2013). On the other hand, Adams and Bonk (1995) stated that lack of knowledge prevent the use of technology in education. Therefore, teachers should learn how to use technology at a basic level. They also know how to integrate technology into curricula (VanFossen, 2001).. In addition, content to use with technology is more important compared to technology itself (Atabek, 2019). Therefore, it is clear that in-service training should be included in the curriculum of teacher training institutions. Therefore, teachers should have positive attitude to use technology and they should engage their technical skills into their subject area teaching with proper approaches.

Within the last sub-problem of the study, it was aimed to determine teachers' positive and negative experiences in using technology during pandemic. Firstly, teachers had the opinion that online education enabled the continuity of education. In addition, in this process teachers had the opportunity to improve themselves, and this process increased student motivation, parental involvement and provided great flexibility for both students and teachers. In many countries around the world, various solutions have been introduced during the pandemic in order to continue the education process. As a result, educational process is not interrupted (Basilaia & Kvavadze, 2020). In his study teachers also mentioned about the importance of the continuity of education, which shows that teachers are aware of the key role of online education in pandemic process in continuing the education. Teachers also indicated that during this process, they could improve themselves. Zhu and Liu (2010) stated that governments should develop teachers' capacity for online teaching and support them for online systems. On the other hand, Thomson (2010) stated that online classes provide flexibility of working at a time and a place that is compatible with students' learning needs. In addition, online classes prevent the problems that may arise when attending traditional class environment such as traffic, missing the classes, etc.

On the other hand, teachers stated that they faced technological problems, students did not attend the online classes, students were demotivated, family support could not be provided, and they could not get support from administrations in online classes that were carried out during pandemic. In their study, Basilaia and Kvavadze (2020) found that online classes were canceled or failed during the first week of online classes during pandemic due to technological problems. Ertmer (2005); Hew and Brush (2007) found that access to technology is an integral part of technology integration. Similarly, Onalan and Kurt (2020) concluded that limited access to technological resources is a notable barrier of online classes. Based on these findings, it can be argued that negative experiences stated by the teachers hinder the effective integration of technology. Therefore, it is understood that this process is more than using computers or digital platforms. All the factors affecting the successful integration of technology into the education should be considered as a whole.

Suggestions

Based on these findings the following suggestions are made:

- Online educational systems should be improved by providing better infrastructure.
- Teachers should be given more support in overcoming the problems they face while using technology for educational purposes.
- Some training should be provided for in-service teachers on how to integrate technology in classes.
- Technological problems should be eliminated.
- Families should be informed on how important their involvement and support is in increasing the success of their children in online classes.

REFERENCES

- Abrami, P. C., & Bures, E. M. (1996). Computer-supported collaborative learning and distance education. *American Journal of Distance Education*, 10(1), 37 – 42.
- Adams, J. A., & Bonk, S. C. (1995). Electronic information technologies and resources: Use by university faculty and faculty preferences for related library services. *College & Research Libraries*, 56, 119-131.
- Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education*, 47(4), 373-398.

- An, Y. J., & Reigeluth, C. (2011). Creating technology-enhanced, learner-centered classrooms: K–12 teachers' beliefs, perceptions, barriers, and support needs. *Journal of Digital Learning in Teacher Education*, 28(2), 54-62.
- Andrew, L. (2007). Comparison of teacher educators' instructional methods with the constructivist ideal. *The Teacher Educator*, 42(3), 157–184.
- Archambault, L., Kennedy, K., & Bender, S. (2013). Cyber-truancy: Addressing issues of attendance in the digital age. *Journal of Research on Technology in Education*, 46(1), 1-28.
- Aslan, A., & Zhu, C. (2017). Starting Teachers' Integration of ICT into Their Teaching Practices in the Lower Secondary Schools in Turkey. *Educational Sciences: Theory & Practice*, 18(1), 23-45.
- Atabek, O. (2019). Challenges in integrating technology into education. *Turkish Studies Information Technologies and Applied Sciences*, 4(1), 1-19.
- Aydın, S. (2013). Teachers' perceptions about the use of computers in EFL teaching and learning: the case of Turkey. *Computer Assisted Language Learning*, 26(3), 214-233.
- Baek, Y. K. (2008). What hinders teachers in using computer and video games in the classroom? Exploring factors inhibiting the uptake of computer and video games. *CyberPsychology & Behavior*, 11(6), 665-671.
- Basilaia, G., & Kvavadze, D. (2020). Transition to online education in schools during a SARS-CoV-2 coronavirus (COVID-19) pandemic in Georgia. *Pedagogical Research*, 5(4), 1-9.
- Baydaş, O., & Göktas, Y. (2016). Influential factors on preservice teachers' intentions to use ICT in future lessons. *Computers in Human Behavior*, 56, 170-178.
- Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2014). Interactive learning online at public universities: Evidence from a six-campus randomized trial. *Journal of Policy Analysis and Management*, 33(1), 94-111.
- Buabeng-Andoh, C. (2019). Factors That Influence Teachers' Pedagogical Use of ICT in Secondary Schools: A Case of Ghana. *Contemporary Educational Technology*, 10(3), 272-288.
- Carver, L. B. (2016). Teacher perception of barriers and benefits in K-12 technology usage. *Turkish Online Journal of Educational Technology-TOJET*, 15(1), 110-116.
- Creswell, J.W. (2013). *Qualitative Inquiry & Research Design: Choosing Among The Five Approaches*. Thousand Oaks, CA: Sage Publications, Inc.
- Courville, K. (2011). Technology and Its Use in Education: Present Roles and Future Prospects. *Online Submission*. <https://files.eric.ed.gov/fulltext/ED520220.pdf>.
- Davies, R. S., & West, R. E. (2014). Technology integration in schools. In *Handbook of research on educational communications and technology* (4th ed., pp. 841–853). Springer New York.
- Dede, C. (2011). Reconceptualizing technology integration to meet the necessity of transformation. *Journal of Curriculum and Instruction*, 5(1), 4-16.
- Dougherty, K. J. (2012). Transforming teaching and learning through the virtual classroom. *College Quarterly*, 15(4), <https://files.eric.ed.gov/fulltext/EJ998781.pdf>.

- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107-115.
- Ertmer, P. A. (1999). Addressing first-and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 47-61.
- Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, 53(4), 25-39.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1-4.
- Franciosi, S. J. (2012). Transformational leadership for education in a digital culture. *Digital Culture & Education*, 4(1), 235-247.
- Ghavifekr, S., & Rosdy, W. A. W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science*, 1(2), 175-191.
- Grabe, M., & Grabe, C. (2007). *Integrating technology for meaningful learning (5th ed.)*. Boston, MA: Houghton Mifflin.
- Gilbert, B. (2015). *Online learning revealing the benefits and challenges* (Master Thesis). St. John Fisher College.
- Göktaş, Y., Yıldırım, Z., & Yıldırım, S. (2008). The keys for ICT integration in K-12 education: Teachers' perceptions and usage. *Hacettepe University Journal of Education*, 34(34), 127-139.
- Göktaş, Y., Gedik, N., & Baydaş, O. (2013). Enablers and barriers to the use of ICT in primary schools in Turkey: A comparative study of 2005-2011. *Computers & Education*, 68, 211-222.
- Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), 223-252.
- Jamieson-Proctor, R., Albion, P., Finger, G., Cavanagh, R., Fitzgerald, R., Bond, T., & Grimbeek, P. (2013). Development of the TTF TPACK survey instrument. *Australian Educational Computing*, 27, 26-35.
- Kafyulilo, A., Fisser, P., & Voogt, J. (2016). Factors affecting teachers' continuation of technology use in teaching. *Education and Information Technologies*, 21(6), 1535-1554.
- Karakainen, M. T., & Saikkonen, L. (2021). Multilevel analysis of the educational use of technology: Quantity and versatility of digital technology usage in Finnish basic education schools. *Journal of Computer Assisted Learning*, 37, 953-965.
- Karchmer-Klein, R. (2007). Reexamining the practicum placement: How to leverage technology to prepare preservice teachers for the demands of the 21st century. *Journal of Computing in teacher Education*, 23(4), 121-128.
- Kim, C., Kim, M. K., Lee, C., Spector, J. M., & DeMeester, K. (2013). Teacher beliefs and technology integration. *Teaching and Teacher Education*, 29, 76-85.
- Koehler, M. J., & Mishra, P. (2008). Introducing TPCK. AACTE Committee on Innovation and Technology (Ed.), *The handbook of technological pedagogical content knowledge (TPCK) for educators* (pp. 3-29). Mahwah, NJ: Lawrence Erlbaum Associates.

- Lawrence, J. E., & Tar, U. A. (2018). Factors that influence teachers' adoption and integration of ICT in teaching/learning process. *Educational Media International*, 55(1), 79-105.
- Lee, J., & Spires, H. (2009). What students think about technology and academic engagement in school: Implications for middle grades teaching and learning. *AACE Journal*, 17(2), 61-81.
- Levin, T., & Wadmany, R. (2008). Teachers' views on factors affecting effective integration of information technology in the classroom: Developmental scenery. *Journal of Technology and Teacher Education*, 16(2), 233-263.
- Liu, S. H. (2012). A multivariate model of factors influencing technology use by preservice teachers during practice teaching. *Journal of Educational Technology & Society*, 15(4), 137-149.
- Lowther, D. L., Inan, F. A., Daniel Strahl, J., & Ross, S. M. (2008). Does technology integration "work" when key barriers are removed?. *Educational Media International*, 45(3), 195-213.
- Ludwig-Hardman, S., & Dunlap, J. C. (2003). Learner support services for online students: Scaffolding for success. *The International Review of Research in Open and Distributed Learning*, 4(1), 1-15.
- Markauskaite, L. (2007). Exploring the structure of trainee teachers' ICT literacy: the main components of, and relationships between, general cognitive and technical capabilities. *Educational Technology Research and Development*, 55(6), 547-572.
- Matuga, J. M. (2009). Self-regulation, goal orientation, and academic achievement of secondary students in online university courses. *Journal of Educational Technology & Society*, 12(3), 4-11.
- Ministry of National Education (MoNE). (2007). Temel eğitim projesi II. fazı: BT entegrasyonu temel araştırması [Basic education second phase: IT integration basic research]. Ankara, Turkey: MEB Projeler Koordinasyon Merkezi Başkanlığı.
- Nelson, J., Christopher, A., & Mims, C. (2009). Transformation of teaching and learning. *TechTrends*, 53(5), 810-87.
- Nikolopoulou, K., & Gialamas, V. (2016). Barriers to ICT use in high schools: Greek teachers' perceptions. *Journal of Computers in Education*, 3(1), 59-75.
- Okita, S. Y., & Jamalain, A. (2011). Current challenges in integrating educational technology into elementary and middle school mathematics education. *Journal of Mathematics Education at Teachers College*, 2(2), 49-58.
- Onalan, O., & Kurt, G. (2020). Exploring Turkish EFL teachers' perceptions of the factors affecting technology integration: A case study. *Journal of Language and Linguistic Studies*, 16(2), 626-646.
- Peeraer, J., & Van Petegem, P. (2012). The limits of programmed professional development on integration of information and communication technology in education. *Australasian Journal of Educational Technology*, 28(6), 1039-1056.
- Pelgrum, W.J. (2001). Obstacles to the integration of ICT in education: Results from a Worldwide Educational Assessment. *Computers & Education*, 37, 163-178.
- Perkmen, S. (2008). *Factors that influence pre-service teachers' technology integration performance*. (PhD Thesis), Iowa State University.

- Ritzhaupt, A. D., Dawson, K., & Cavanaugh, C. (2012). An investigation of factors influencing student use of technology in K-12 classrooms using path analysis. *Journal of Educational Computing Research*, 46(3), 229-254.
- Russell, M., Bebell, D., O'Dwyer, L., & O'Connor, K. (2003). Examining teacher technology use: Implications for preservice and inservice teacher preparation. *Journal of Teacher Education*, 54(4), 297-310.
- Salehi, H., & Salehi, Z. (2012). Challenges for using ICT in education: teachers' insights. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 2(1), 40-43.
- Sang, G., Valcke, M., Van Braak, J., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education*, 54(1), 103-112.
- Savenye, W. C. (2005). Improving online courses: What is interaction and why use it?. *Distance Learning*, 2(6), 22-28.
- Sipila, K. (2014). Educational use of information and communications technology: teachers' perspective. *Technology, Pedagogy and Education*, 23(2), 225-241.
- Snyder, M. (2014). *Technology Integration for Educators: The Why and the How* (Master Thesis). Eastern Michigan University.
- Tarman, B. (2016). Innovation and education. *Research in Social Sciences and Technology*, 1(1), 77-97.
- Tarman, B., Kilinc, E., & Aydin, H. (2019). Barriers to the Effective Use of Technology Integration in Social Studies Education. *Contemporary Issues in Technology and Teacher Education*, 19(4), 736-753.
- Tezci, E. (2011). Factors that influence pre-service teachers' ICT usage in education. *European Journal of Teacher Education*, 34(4), 483-499.
- Thomas, M. O., & Vela, C. (2003). Computers in the Primary Classroom: Barriers to Effective Use. *International Group for the Psychology of Mathematics Education*, 4, 347-354.
- Thomson, D. L. (2010). Beyond the classroom walls: Teachers' and students' perspectives on how online learning can meet the needs of gifted students. *Journal of Advanced Academics*, 21(4), 662-712.
- Tondeur, J., Van Braak, J., & Valcke, M. (2007). Towards a typology of computer use in primary education. *Journal of Computer Assisted Learning*, 23(3), 197-206.
- Wang, Q., & Woo, H. L. (2007). Systematic planning for ICT integration in topic learning. *Journal of Educational Technology & Society*, 10(1), 148-156.
- Winter, E., Costello, A., O'Brien, M., & Hickey, G. (2021). Teachers' use of technology and the impact of Covid-19. *Irish Educational Studies*, 1-12.
- Vanfossen, P. J. (2001). Degree of Internet/WWW use and barriers to use among secondary social studies teachers. *International Journal of Instructional Media*, 28(1), 57-74.
- Zhu, X., & Liu, J. (2020). Education in and After Covid-19: Immediate Responses and Long-Term Visions. *Post-digital Science and Education*, 1-5.