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Use of Technology-Supported Educational Tools in General Music Education and Its Contribution to the Process of Music Education

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Abstract:

Introduction: In our current century, technology continues to exist in almost all domains of human life. In this day and age, technological changes and developments make a great contribution to the rapid production of information and easy access to it. As a result of rapidly developing and changing needs, it is considered essential to organize education in line with these needs and to incorporate technology within the education system. In the present study, it was aimed to identify the use of technology supported educational tools in general music education and their contribution to the process of music education.

Methods: The convergent parallel design, which is one of the mixed research methods, was used in this study. Based on this particular point in mind, it was attempted in this study to establish the opinions of music teachers about the level of use of technology-supported educational tools in general music education through both closed-ended and open-ended questions. In this study, homogeneous sampling was used and it was attempted to reach out the teachers who taught general music knowledge in Turkey. The study group of the research was formed with 59 music teachers teaching at different institutions who agreed to participate in the study on a voluntary basis.

Results: In line with the data obtained, it was concluded that teachers found themselves partially sufficient and willing to improve themselves in terms of using the technology-supported educational materials more effectively and efficiently in the process.

Discussion: From the results of the research, it is seen that technology-supported applications are used especially in the listening and expression stages of the teacher, and it is preferred in the sampling, song teaching and showing and telling stages.

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In addition, it was determined that these applications were used by only 1 participant during the evaluation phase. It has been determined that technology-supported applications contribute positively to learning speed, permanent learning and the realization of more effective lessons. Throughout the music education process, which includes abstract concepts, the students' acquisition of the knowledge and making sense of this knowledge will contribute positively to their academic success. It is believed that it is essential to draw students' attention and include them effectively within the education process by getting them to gain new experiences. In this sense, it is crucially significant that teachers have the competence to use different applications in today's age of technology.

Limitations: The research was limited to 59 music teachers who voluntarily agreed to work during the data collection process. The research was carried out in the spring term of the 2020-2021 academic year.

Conclusions: In accordance with the findings obtained from the study, it was found that the participants utilized the technology-supported teaching tools especially in listening and lecturing, and they did not use these tools throughout the process. It was revealed that these tools had positive effects such as increasing students' attention and contributing to their permanent learning, as well as negative effects such as the tendency (to expect everything to be handed to one on a silver plate) and reducing the teacher's remedial role.

Key words: technology, educational tool, music education, general music education.

Introduction

In our current century, technology continues to exist in almost all domains of human life. In this day and age, technological changes and developments make a great contribution to the rapid production of information and easy access to it. As a result of rapidly developing and changing needs, it is considered essential to organize education in line with these needs and to incorporate technology within the education system (Crawford, 2017; Başak & Ayvacı, 2017).

In today's education programs in which the constructivist education approach is adopted, offering effective and productive learning environments to the individuals with different learning skills (Başak & Ayvacı, 2017) is considered crucial and indispensable for the students to acquire knowledge and new skills. In this context, the active use of technology in learning environments prepared by the teachers with this constructivist approach and presented to the students will greatly contribute to supporting the learning process and making sense of the knowledge acquired by the students (Bofill, 2013; Jacobsen, 2021), and the inclusion of technology in the teaching process will support the strengthening of the effect of the educational practices (Demirtaş & Mumcu, 2021). It is

considered that the incorporation of technology within the education process with a good planning will support the learning processes of students with different learning speeds and their access to higher quality learning environments (Burak & Çörekçi, 2021).

With the educational technologies (Ulaş & Ozan, 2010; Alkan, 2011), which aim to use the developments in science and technology and the inventions in education activities for the design, implementation, evaluation and development of learning and teaching processes, it was aimed to make these processes more efficient and enriched and offer various learning opportunities for students. In this context, it is considered essential to carry out music education, which is thought to play an important role as an educational factor in the lives of the society as well as the individuals in this society and which contributes significantly to the development of the individual's aesthetic taste and cultural level, with a well-organized program that includes today's technologies.

With the advancing technology, it is commonly recognized that technology is incorporated within the music education processes at all levels from pre-school all the way to university level (Burak & Çörekçi, 2021; Shi, 2021; Fu et al., 2022); the studies demonstrate that the use of information technologies in music education contributes significantly to the educational process and makes learning environments more colorful (Beşer, 2010; Nart, 2016; Çevik & Alkan, 2012; Talan, 2020; Zhao, 2022).

With the constructivist approach of today's education conception, the popularity of incorporating technology within the education process continues to increase, especially within the framework of global changes and technological developments (Qureshi et al., 2020; Zengin et al., 2018). In this context, it is commonly recognized that the technology-supported applications, which are also used in music education, contribute positively to students' active participation in the process, in terms of supporting their creativity, providing more opportunities for cooperation and sharing their existing capacities (Shi, 2021).

When the relevant literature is examined, it is clear that there are studies on the use of technology supported educational tools in music education and their contribution to the process of education. In his study, Doğan (2020) aimed to identify the opinions of music teachers on their ability to use technology in music education. As a result of the study, it was found that music teachers graduated without having sufficient knowledge in the field of music technologies in their undergraduate education, that the teachers did not have sufficient knowledge about online and offline music education programs, and that they partially used technology in music education. In his study, Kim (2013) aimed to establish to what extent the technology-supported teaching-learning approach in music lessons improved the creativity and musical perceptions of students in and out of the classroom. As a result of the study, it was revealed that the

technology-supported teaching-learning approach contributed positively to the creativity of the students, changed their musical perceptions and improved their musical creativity. Bannerman et al. (2021) aimed to establish the personal technology use of music teacher candidates, their views on the use of technology in music teaching and their experiences with music technology. They concluded that music teacher candidates used technology for various purposes on a daily basis and did not feel knowledgeable about technology for teaching music. Yi Lei et al. (2021) aimed to identify the contribution of social media use in instrument education in their study. They found that social media facilitated information sharing, attracted students' attention, supported communication, and created a virtual learning environment to support the face-to-face teaching. Furthermore, they concluded that social media-supported teaching-learning environments contributed positively to the development of students' techniques and musical styles.

It is believed that learning environments in which technological tools are incorporated contribute to the development of high-level thinking skills of the students, and they have the opportunity to better evaluate themselves in a more active and effective learning process (NETP17, 2017; Altunışık & Aktürk, 2021). Within this framework, there are many technology-supported applications that both students and teachers can utilize in the education process. It is considered essential to include these practices in the education process at a level that can be used effectively and efficiently.

The previous studies demonstrated that the inclusion of different technological applications in the education process had positive effects on the process of music teaching (Jong & Tan, 2021; Ortaakarsu & Sülün, 2022; Bilir & Özdilek, 2022). Therefore, it is considered crucial that the teachers, who have made great contributions to the organization of learning and teaching environments, can alter and develop their level of use of technology and their pedagogical approaches accordingly in the rapidly developing digital age. Similarly, in music education, which comprises many disciplines, it is considered essential to integrate technology in general in line with the structure of the course.

With this idea in mind, the purpose of the present study was to identify the use of technology-supported educational tools in general music education and its contribution to these tools to the process of music education. Therefore, in line with the question “What is the use of technology-supported teaching tools and what is the contribution of these tools to the process of music education?", answers were sought to the following questions:

1. What are the views of the participants on the use of technology-supported educational materials in the process of music education?
2. What are the views of the participants on the availability of technology-supported educational materials that can be used in the teaching process in the institution where they work?
3. What are the views of the participants on the use of technology-supported educational materials in the music education process?
4. What are the views of the participants on the effects of using technology-supported educational materials in music education?
5. What are the views of the participants on their competence to be able to use technology-supported educational materials?

1 Methods

The convergent parallel design, which is one of the mixed research methods, was used in this study. In this design, qualitative and quantitative data are obtained simultaneously but analyzed independently during the study process, and they are joined together in the section on obtaining and interpreting the results (Çepni, 2021). Data validation format, which is one of the basic forms of convergent parallel design, was utilized. In this type of questionnaire or interview form, there are both open-ended and closed-ended questions. The results of the open-ended questions are used to validate the results of the closed-ended questions (Creswell & Plano Clark, 2020). Based on this particular point in mind, it was attempted to establish the opinions of music teachers about the level of use of technology-supported educational tools in general music education through both closed-ended and open-ended questions.

1.1 Study group

The purposive sampling method, one of the qualitative research methods, was utilized in the sample selection phase of the study. The sampling enables the researcher to reach out participants with a sufficient level of knowledge for purposeful in-depth study about the situations of fundamental importance related to the subject studied (Patton, 2018). In this study, homogeneous sampling was used and it was attempted to reach out the teachers who taught general music knowledge in Turkey. The study group of the research was formed with 59 music teachers teaching at different institutions who agreed to participate in the study on a voluntary basis. The names of the teachers in the study group will not be revealed in the study, and Participant 1 (P1), Participant 2 (P2) etc. were coded accordingly. The demographic information of the participants is illustrated in Table 1.

Table 1

Demographic information of the participants

Gender	*n*	*%*
Female	46	77,97
Male	13	22,03
Age	*n*	*%*
25-30	6	10,17
31-40	10	16,95
41-50	35	59,32
51-60	7	11,86
61 years old and over	1	1,70
Working institution	*n*	*%*
Private School	3	5,08
Public School	56	94,92
Professional seniority	*n*	*%*
1-5	4	6,78
6-10	6	10,17
11-15	9	15,25
16-20	7	11,86
Other	33	55,94
Total	59	100

As seen in Table 1, it was established that 77.97% of the participants were female, 22.03% were male; 10.17% of the participants were 25-30 years old, 16.95% 31-40 years old, 59.32% 41-50 years old, 11.86% 51-60 years old and 1.7% were 61 years old and over. It was also established that 5.08% of the participants taught at a private school and 94.92% at a public school; 6.78% of them had 1-5 years of professional seniority, 10.17% of them 6-10 years, 15.25% of them 11-15 years, 11.86% of them 16-20 years and 55.94% had over 20 years of professional seniority.

Table 2 illustrates the findings related to the music departments which the participants graduated from.

Table 2

Participants' graduate program

Faculty/program name	*n*	*%*
Faculty of Education	54	91,53
Turkish Folk Music Conservatory	2	3,39
State Conservatory	1	1,69
Turkish Music State Conservatory	2	3,39
Total	59	100,00

As is clear in Table 2, it was established that 91.53% of the participants were graduates of the Faculty of Education, 3.39% of them graduates of the Turkish Folk Music Conservatory and Turkish Music State Conservatory and 1.69% of them graduates of the State Conservatory.

2 Results

In this section, the results obtained from the data collection tools are presented. Table 3 illustrates the results regarding the use of technology-supported education materials in music education by the participants.

Table 3

The use of technology-supported educational materials by the participants in music education

Use of Materials	*n*	*%*
Yes	53	89,83
No	6	10,17
Total	59	100,00

As Table 3 illustrates, it was established that the majority of the participants used technology-supported educational materials in the process of music education. Table 4 presents the results regarding the technology-supported applications used by the teachers during the lesson.

Table 4

Technology-supported applications used by the participants

Used of Technology-supported Applications	*n*	*%*
Youtube	56	91,94
Kahoot	10	17,74
Powerpoint	32	53,23
WhatsApp	38	62,9
Instagram	10	17,74
Powtoon	2	3,23
Google Drive	25	38,71
Flipgrid	1	1,61
Quiziz	1	1,69
Tindercard	1	1,69
Webex	1	1,69
Zoom	4	6,78
Google Meet	1	1,69
Camtasia	1	1,69
Cool Edit Pro.	1	1,69
Learnings App	1	1,69
Finale	1	1,69

As Table 4 illustrates, 91.94% of the participants used Youtube, 62.9% WhatsApp, 53.23%, PowerPoint, 38.71%, Google Drive, 17.74% Kahoot and Instagram applications during their teaching processes. Nevertheless, it was also established that some participants used different online applications throughout their process of music education.
Table 5 presents the findings regarding the technology-supported materials in the institution where the participants worked.

Table 5

Technological materials available in the institution where the participant teachers worked

Technological Materials	*n*	*%*[1]
Projector	24	40,68
Smart Board	56	94,92
Computer	40	67,8
Tablet	11	18,64
Sound Systems	18	30,51

As is clear in Table 5, it was established that 94.92% of the institutions where the participants worked had smart boards, 67.8% computers, 40.68% projectors, 30.51% sound systems and 18.64% a tablet. Based on this, it is possible to say that most of the institutions were equipped to use applications that could make the lesson process more active and contribute to effective and efficient teaching and learning.
In Figure 1, the views of the participants regarding the use of technology-supported educational tools in the process of music education are illustrated.

[1] Some schools have more than one technological material.

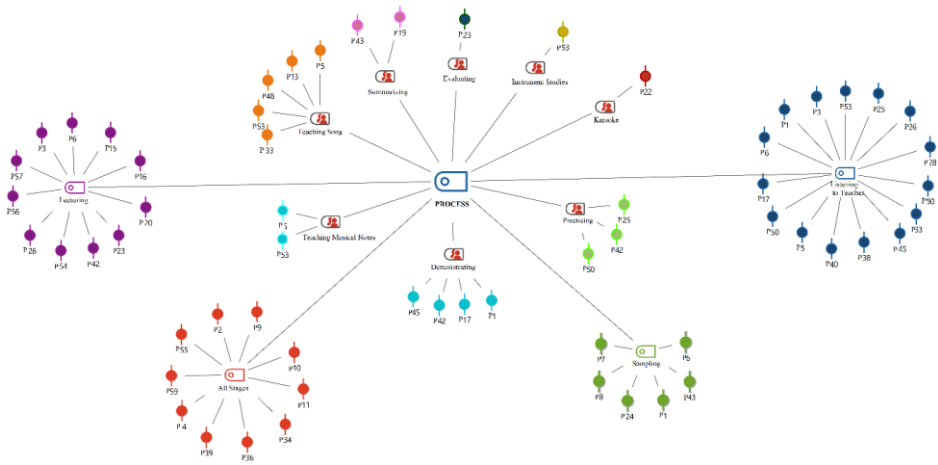

Figure 1. Participants regarding the use of technology-supported educational tools in the process of music education.

Figure 1 illustrates the participants who expressed their opinions on which processes of music education the technology-supported teaching tools were used. It was established that the participants expressed their opinions regarding the "process" theme of the participants such as listening to the teacher (15), lecturing (11), all stages (10), sampling (6), teaching songs (5), demonstrating (4), practicing (3), teaching musical notes (2), summarizing (2), evaluating (1), instrument studies (1) and karaoke (1). It is clear that the participants who used technology-supported the educational tools in the process of music education used these tools more in listening to the teacher and lecturing. Based on this, it is possible to claim that the teachers were unqualified in terms of using technology-supported educational tools at all stages of the education process.

Some of the views of the participants on this theme are presented below:

"I use technology-supported educational tools in order to support the lesson according to the characteristics of the subjects. For instance, I realize that showing the visuals and getting the students to listen to sound of the instrument in addition to explicating the subject in introducing an instrument positively supports the desired learning outcome (P7)".

"I use the technology-supported educational tools in lecturing and evaluation stages (P23)".

Figure 2 illustrates the participants' views on the positive effects of using technology-supported educational materials in music education.

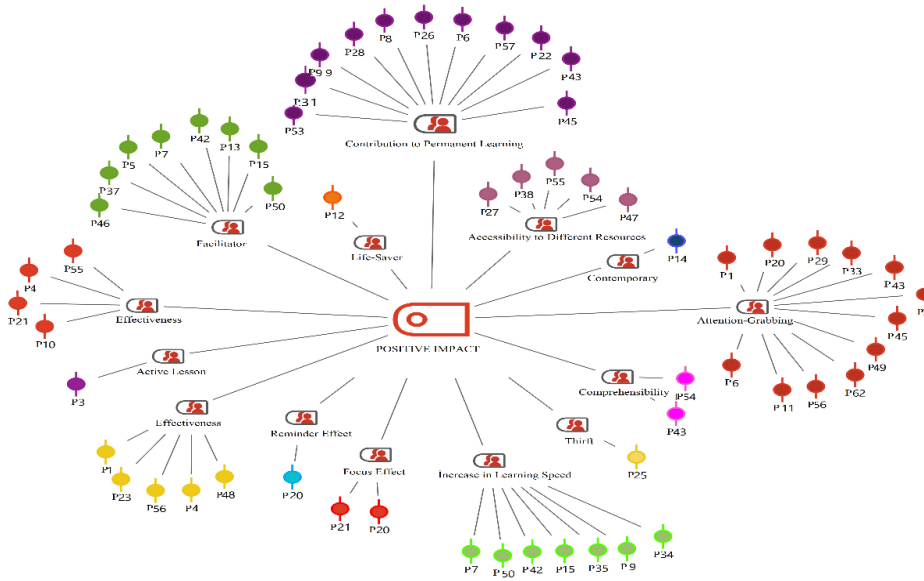

Figure 2. Participants' views on the positive effects of using technology-supported educational materials in music education.

As is clearly seen in Figure 2, some participants expressed their opinions on the positive effects of using technology-supported educational materials in music education. Regarding theme of "positive impact", it was found that the participants expressed their views with the words such as attention-grabbing (12), contribution to permanent learning (11), effectiveness (9), facilitator (8), increase in learning speed (7), accessibility to different resources (5), comprehensibility (2), thrift (1), reminder effect (1), contemporary (1), active lesson (1) and life-saver (1). It is clear that the use of technology-supported educational materials in the lesson process contributes to attention-grabbing and permanent learning. As far as this point of view is concerned, it is possible to say that the use of technology support at every stage of the learning process, in line with the necessity of the current era, is essential for the realization of permanent changes in learning.

Some views of the participants on this theme are presented below:

"Visually showing the instrument and getting the students to listen to its sound help to attract the students' attention more and enables them to learn more permanently. I constantly feel the need to turn on music and do activities such as dancing or playing games on it (P6)".

"It is lovely to be able to instantly access all kinds of supporting audio, visual, etc., materials related to outcomes and have the students to watch and listen to them. Sharing the activities prepared by the students with their friends, I think technology is beneficial in preparing and presenting their own projects (P55)."
Figure 3 illustrates the participants' views on the negative effects of using technology-supported educational materials in music education.

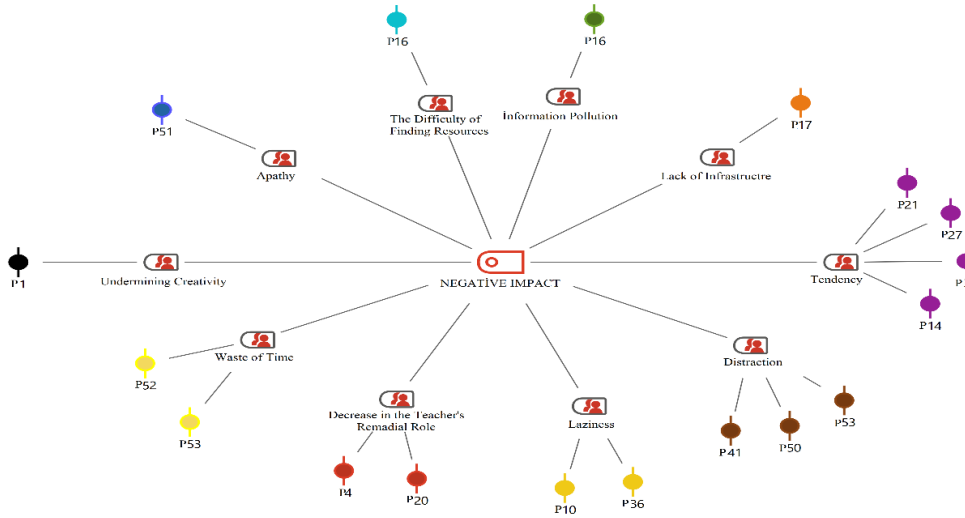

Figure 3. Participants' views on the negative effects of using technology-supported educational materials in music education.

As illustrated in Figure 3, some participants expressed their opinions about the negative effects of using technology-supported educational materials in music education. Regarding theme of "negative impact", it was found that the participants expressed their views with the words such as the tendency (to expect everything to be handed to one on a silver plate) (4), distraction (3), laziness (2), decrease in the teacher's remedial role (2), waste of time (2), undermining creativity (1), apathy (1), the difficulty of finding resources (1), information pollution (1) and lack of infrastructure (1). Based on this, it is possible to claim that the use of technology support in the education process may have negative effects in terms of the effectiveness of the process as well as the positive effects.
Some views of the participants on this theme are presented below:
"Sometimes we may deviate from the subject. Lesson time may not be enough (P19)".
"Using technology-supported educational materials makes students and teachers lazy (P36)".

"These materials can cause some students to be extremely distracted and tend to be interested in any application other than the lesson content. Furthermore, the applications connected with individual mobile phones, such as the kahoot application, can cause students to focus on their private lives during the lesson (P41)".

Figure 4 shows the participant's views on their ability to use technology-supported teaching materials.

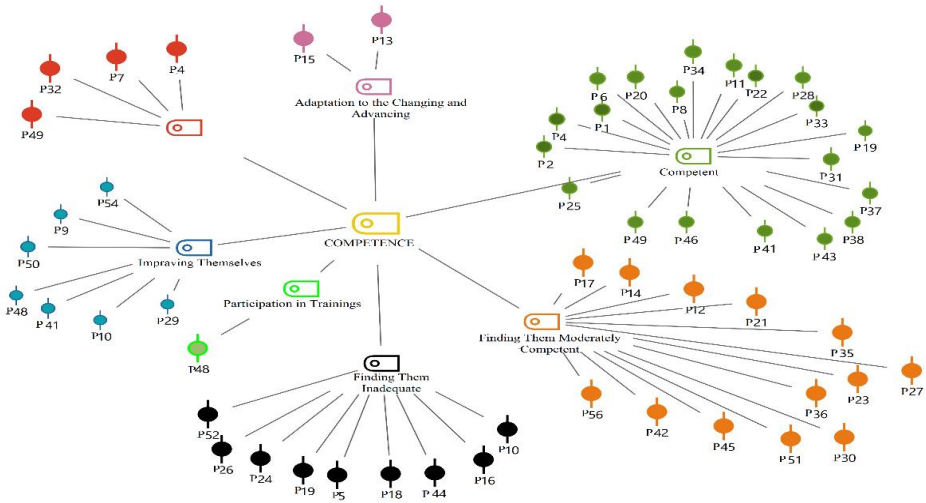

Figure 4. Illustrates the participants' views on their ability to use technology-supported teaching materials

As is clearly seen in Figure 4, some participants expressed their opinions about the ability to use technology-supported teaching materials. Regarding theme of " competence", it was found that the participants expressed their views with the words such as finding themselves competent (20), finding them moderately competent (13), finding them inadequate (9), improving themselves (7), the need to adapt (4), willingness to receive training (2), and participation in trainings (1). It was established that some of the participants considered themselves sufficient in using technology during the education process. Nevertheless, it is possible to say that the participants were willing to receive further training for the purpose of using the technology-supported educational materials more effectively during the education process and show improvement.

Some views of the participants on this theme are presented below:

"I do not have any difficulty in using the technological educational materials while teaching my lesson, but the applications and software used may change over time. Technology is a constantly changing and developing field and the teacher should be in the process of self-development in order to keep up with the current era (P7)".
"I have quite low proficiency. I have been trying to carry out with some external assistance (P18)".

3 Discussion, conclusion and recommendations

As far as the results obtained from the study are concerned, it was found that the majority of the participants used the technology-supported applications in their teaching processes, especially within the classroom practices, and they did not use different applications that would support the process outside the classroom. We are of the opinon that this particular state of affairs arises due to the fact that teachers do not have the competence to use these different applications. Similar studies also demonstrated that teachers were not sufficient to actively use the technological equipment in their education processes (Doğan; 2020; Erdoğan & Şerefli, 2021; Francom, 2020). Therefore, it is considered essential for teachers to incorporate the technology-supported educational materials, both inside and outside the classroom, in order to ensure active participation of the students within the teaching process and permanent changes in the learning/teaching process.

As far as the results obtained from the findings in the study are concerned, it was clear that there are different technological materials that the participants could use in the music lessons in the institutions where they worked, and the majority of the institutions had smart boards. Clearly, it was necessary for institutions to have sufficient technological equipment in order to ensure the continuity of the student's interest in the lesson and to be able to work more effectively and efficiently. Nevertheless, it was considered crucial to integrate these existing resources into the education process and create a learning and teaching environment in which both students and teachers were actively involved (Hew & Brush, 2007; Korkmaz et al., 2019).

It is commonly recognized that technology-supported applications support the education process in today's age of technology (Sarı & Akbaba Altun, 2015; Şahin & Güler, 2021; Turhan & Baş; 2017; Yang, 2022; Korkmaz & Biber, 2022). From the results of the study, it was established that the technology-supported applications were used especially in listening to the teacher and lecturing stages, and they were also preferred in the sampling, song teaching and demonstration stages. It was also established that these applications were used by only 1 participant during the evaluation phase. When the relevant literature is examined, it is clear that there are studies on the use of different applications in

the evaluation phase of the teaching process. In their study, Karadağ and Garip (2021) concluded that LearningApps application could be used in reinforcement and evaluation stages. On the other hand, studies stating that the use of technology-supported applications in different stages of teaching, including assessment, promoted the process, also supported the results of these studies (Hew & Brush, 2007; Bofill, 2013). As far as this point of view is concerned, it is crucially significant to utilize the technology (Fu et al., 2022) that supports the individuals to experience new information effectively and efficiently, in accordance with the projected target at every stage of the education process.

As far as the ensuing results are concerned, it was established that the technology-supported applications contributed positively to the learning speed, permanent learning and the realization of more effective lessons. Furthermore, it was also found that the lessons were more comprehensible and contributed to the student's active participation. In support of the results of the study, Şahbaz and Arseven (2022) found in their study that Scratch program-supported teaching had a positive effect on the academic success and learning levels of the students. Dikkartin Övez and Sezginsoy Şeker (2022), on the other hand, established in their study that students' motivation towards materials prepared with augmented reality technology and their attitudes towards these applications were at a very high level. Zhou (2020) found in his study, that technology-supported music education positively impacted the students' participation in the teaching process. Furthermore, there are some other different studies in the relevant literature on the positive effects of technology applications in the music education process (Okay, 2016; Karaöncel & Çiftçi, 2022; Hernandez Bravo & Cardona Molto, 2015; León-Garrido et al., 2022). Based on this, within the framework of the constructivist approach in today's education programs, clearly it is essential to prepare and present active learning environments in which technology is incorporated within the education process in order for the student to be involved in the process and make sense of the knowledge and information.

It was established that technology-supported applications offered the students the tendency (to expect everything to be handed to one on a silver plate), had a distracting effect, and negatively affected their creativity. There are studies in the relevant literature (Şahin, 2019; Öner, 2020) on the negative effects of technology within the education process, supporting this particular result of the study. It is essential to achieve the maximum positive contribution to the education process of the digital age we live in, in order to educate the next generations well-equipped. Therefore, it is of crucial importance that teachers arrange their lesson preparations and teaching practices in the most effective way in order to minimize the negative effects of technology within the education process.

It was found our study, that the majority of the participants stated that they had the competence to use the technological educational materials. However, it was also established that some participants thought that they improved themselves, while some participants stated that they needed to adapt to the new technology. Supporting the results of the present study, Can and Kekez (2022) revealed in their study that the physical education and sports teachers' levels of integrating web 2.0 tools into their lessons differed in favor of the teachers who took technology courses. Francom (2020), on the other hand, established in his study that teachers' existing personal competencies in using these tools negatively affected the use of technology in the education process. As far as this point of view is concerned, it is believed that it is not sufficient for teachers to have only the technological equipment; it is equally essential for them to integrate this equipment into their lessons at the same time. Furthermore, it is considered significant that teachers can actively use their equipment in in-class and out-of-class activities and include their students within the process (Ertmer et al., 1999; Carver, 2016).

In the light of the findings obtained from the study results, the following suggestions can be offered:

Throughout the music education process, which includes abstract concepts, the students' acquisition of the knowledge and making sense of this knowledge will contribute positively to their academic success. It is believed that it is essential to draw students' attention and include them effectively within the education process by getting them to gain new experiences. In this sense, it is crucially significant that teachers have the competence to use different applications in today's age of technology. Nevertheless, it is also commonly recognized that it is essential to identify the appropriate strategies for the subject with a good planning and be able to include different applications at the different stages of the education process. Therefore, it is recommended that teachers be supported with in-service trainings for the purpose of improving their personal competencies, being fully aware of the technological changes and developments, and using the technological materials in a planned and active way in the course process.

It is clearly evident that the use of activities carried out with different technological materials within the music education process based on creativity will contribute positively to the motivation, musical-oriented thinking, musical practices and musicality of the students. With this in mind, it is recommended to conduct experimental studies with the students at different grades on how the technological materials incorporated in the music education process through in-class and extra-curricular activities contribute to the student overall success.

It is equally essential for the schools to be supported by the institutions in order for the rapidly changing and renewed technological software and hardware to be able to work without any problems in order to use the technological materials.

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