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Tendencies of Prospective Music Teachers to Use Technology and the Status of Technology Use in Teaching Practice Course

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ABSTRACT

This study aimed to reveal the tendencies of prospective music teachers towards the use of technology in the lesson, their use of technology in the music lesson practices they conduct in the school environment within the scope of the "teaching practice" course, and their views on this. This study used the convergent mixed method design, in which qualitative and quantitative data were collected together but analyzed separately. The study group included 88 prospective music teachers who were continuing their education in various state universities during the 2022-2023 academic year. The data were collected with multiple-choice questions in the *Tendency Scale for Technology Use in Class* and the *Questionnaire Form on the Use of Technology in the Teaching Practice Course of the Prospective Teachers*, and the qualitative data were collected with the open-ended questions in the same questionnaire. The quantitative results concluded that the prospective teachers' tendencies towards technology use were at an above-average level, their recognition rate of music/hearing education software was below the middle, and the frequency of technology use in practice courses was generally below medium. The qualitative findings highlighted the opinions of the prospective teachers emphasizing the advantages of technology as facilitating, being economical, and providing efficient learning, problems related to the internet connection in the classroom environment, and the inadequacy of technological equipment came to the fore. Among the suggestions of the participants, the study emphasized that the prospective and in-service teachers should be trained in the use of technology.

Keywords: Prospective music teachers, teaching practice course, tendency to use technology, music education, technology use in the course

Müzik Öğretmeni Adaylarının Teknoloji Kullanımına Yönelik Eğilimleri ve Öğretmenlik Uygulaması Dersinde Teknoloji Kullanım Durumları

Bilgi
**Sorumlu yazar*

Süreç
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Bu çalışma ön inceleme sürecinde ve yayımlanmadan önce iThenticate yazılımı ile taranmıştır.

ÖZ

Bu araştırma, müzik öğretmeni adaylarının derste teknoloji kullanımına yönelik eğilimlerini, "öğretmenlik uygulaması" dersi kapsamında okul ortamında yürüttükleri müzik dersi uygulamalarında teknoloji kullanım durumlarını ve buna yönelik görüşlerini ortaya koymayı amaçlamaktadır. Karma yöntemin izlendiği bu araştırma, eş zamanlı çeşitleme desenindedir; nitel ve nicel veriler birlikte toplanmış, ancak ayrı ayrı çözümlenmiştir. Çalışma grubunu farklı devlet üniversitelerinde 2022-2023 öğretim yılında eğitimine devam eden 88 müzik öğretmeni adayı oluşturmaktadır. Veriler *Derste Teknoloji Kullanımına Yönelik Eğilim Ölçeği* ve *Öğretmen Adaylarının Öğretmenlik Uygulaması Dersinde Teknoloji Kullanım Durumlarına İlişkin Anket Formu*'nda yer alan çoktan seçmeli sorularla, nitel veriler ise aynı anket formundaki açık uçlu sorularla toplanmıştır. Elde edilen nicel bulgular doğrultusunda, öğretmen adaylarının teknoloji kullanımına yönelik eğilimlerinin orta üstü bir düzeyde olduğu, müzik/işitme eğitimi yazılımlarını tanıma oranlarının ortanın altında kaldığı ve genel olarak uygulama derslerinde teknoloji kullanım sıklıklarının orta altı düzeyde olduğu sonuçlarına ulaşılmıştır. Araştırmanın nitel verileri doğrultusunda ise, öğretmen adaylarının teknolojinin kolaylaştırıcı olma, ekonomik olma ve verimli öğrenmeyi sağlama avantajlarını, sınıf ortamında internet bağlantısıyla ve teknolojik donanımların yetersizliği ile ilişkili sorunları vurgulayan görüşleri öne çıkmıştır. Katılımcıların önerileri içinde en çok, öğretmen adayları ve öğretmenlere teknoloji kullanımına ilişkin eğitim verilmesi gerekliliği vurgulanmıştır.

Anahtar Kelimeler: Müzik öğretmeni adayları, öğretmenlik uygulaması dersi, teknoloji kullanma eğilimi, müzik eğitimi, derste teknoloji kullanımı

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Introduction

Information is one of the products that are produced the fastest, reached the fastest, and can be accessed through many different channels in the age we live in. The main reasons for this are the developments in technology. These developments and innovations in the field of technology also create changes in the structure of the societies with which they interact (Yeşilorman & Koç, 2014, p. 117). This change in the social structure is reflected in education, which is a system in which it is intertwined. These effects are not unidirectional, technology, society, and education mutually affect each other (Uça Güneş, 2016). Globalization, which is the result of developments in information and communication technologies, has also carried the qualities of individuals who make up societies to a global dimension; For this reason, education is expected to observe universal values as well as national goals (Şahin, 2003). Technology, which also occupies an important area in our daily lives, leads experts, educators, and students to rethink their basic beliefs to use technology to restructure the education system. Relevant equipment also plays an important role so that teachers and students can benefit more from technology in educational processes (Basak, Wotto & Belanger, 2018, p. 191).

The use of technology in education is important because it effectively addresses multiple senses and thus embodies abstract narratives. In addition to this, it can be said that it is one of the necessities of our age to make room for the use of technology in education to adapt to the development and change in science and technology. The use of technology in education, which is also a frequent subject of scientific studies and has importance supported by research findings in different fields of study, becomes a necessity, not a choice when considering the intertwined lives of today's students with technology. As in all learning fields, in contemporary music education, especially in recent years, technological developments and technological searches to reduce the negative reflections of the Covid-19 pandemic process on educational life have brought digital learning environments, tools, and platforms to the fore.

In this definition, Rees (2012) mentioned that music technology is the use of tools and techniques required in the fields of music production, performance, education, and research within a certain system (p. 154); In this direction, it can be said that educational processes are one of the study areas of music technology. A music education using information technology can offer students individual learning opportunities and expand the scope of music learning (Li, Wu, Lin & Chang, 2019, p. 429). New technological equipment is constantly developing, allowing students to establish relationships with music as listeners, interpreters, and creators. With this aspect, technology can profoundly affect and change learning tools when the beneficial aspects of the classroom environment are highlighted and the unhelpful aspects are reduced (Lehman, 2020, p. 70).

Pećanac, Jeremić, and Milenović (2016) observed that digital media creates an increase in students' motivation to learn and improves students' sense of control over a part of the learning process, which in turn creates confidence and satisfaction. In their research, it has been found that students are more willing to learn in the learning processes in which digital media is used (p. 245). Hernández-Bravo, Cardona-Moltó and Hernández-Bravo (2016), in an experimental study they conducted, found that music teaching based on information and communication technology (ICT) provided improvement in musical knowledge, skills, and attitudes of children in the experimental group. They found significant differences in favor of the experimental group in the dimensions of auditory skills, vocal expression, musical expression, movement, dance, art, and culture (p. 190).

The role of music teachers is important in informing and training students on how to use digital technology effectively to support their development in practice (Wagner, 2017, p. 121). Giebelhausen, who defines technology as a powerful tool in music education, argues that using technological supports in the classroom environment increases student participation and interest and creates improvements in teaching levels (p. 45-46). Chen (2021) pointed out that to combine computer technology with basic music education, the equipment in schools should be sufficient, and teachers should be able to use computer technology effectively and scientifically to make a good learning plan (p. 56). Savage (2007) states that technological developments and changes are gradually spreading to traditional practices in music classrooms. He emphasizes that teachers should also be aware that using information and communication technologies has a transformative power on how music can be taught (p. 74).

It is clear that the effective, correct, and controlled use of technological applications in music education will contribute positively to the learning process. The possibility of bringing vitality and difference to learning activities, adding a certain originality by removing the process from uniformity, and increasing student participation and motivation is supported by scientific studies. The aspects of technological systems that support creativity and accelerate access to many different types of information also come to the fore.

Especially in recent years, studies that focus on different variables and different sub-dimensions regarding the use of technology in music education, conducted with teachers, students, prospective teachers, and academicians, are also frequently encountered in our country (Can and Aras, 2017; Afacan and Cemil, 2017; Namdar, Sarıkaya and Sarıkaya, 2017; Parasız, 2018; Kaya, 2019; Atabek and Burak, 2019; Doğan, 2020; Atabek and Burak, 2020; Karataş and Karataş, 2021; Usta, Karataş and Mertoğlu, 2022). It is seen that the

widespread use of technological infrastructure and digital media supporting music education has gained importance in terms of the integrity of pedagogical approaches in the developing and changing world and our country. In this direction, this research aims to reveal the tendencies of the prospective music teachers towards the use of technology, their use of technology in the music lesson practices they carry out in the school environment within the scope of the "teaching practice" course, and their views on it. For this purpose, answers to the following questions are aimed:

1. What is the level of inclination of prospective music teachers toward the use of technology in lessons?
2. What is the situation regarding the use of technology by prospective music teachers during the teaching practice course in the applied school?
3. What are the opinions of prospective music teachers towards the use of technology in the applied school during the teaching practice course?

Method

Research Design

This research followed a convergent mixed method design. Qualitative and quantitative data are collected together but analyzed separately based on the premise that they provide different kinds of information. This research design is particularly useful for cases where a holistic approach to the research subject is desired. By comparing the findings obtained from the two methods, it is determined whether they support each other, and the results of the qualitative and quantitative data are given together at the interpretation stage (Mazlum & Mazlum, 2017, p. 15). While the concordance between qualitative and quantitative data supports the validity of the research, the non-overlapping parties can offer ideas for new studies. The mixed strategy here is based on integration, and the descriptive statistics applied to quantitative data and the frequency distributions of qualitative data are compared (Yıldırım, 2019, pp. 320-322).

Study Group

The participants of the research consisted of 88 students, 58 females, and 30 males, who continued their education in music teaching programs affiliated with 12 state universities in Türkiye, who took the Teaching Practice 1 course, and who participated voluntarily in the research. The distribution of the participants according to the university they attended is given in Table 1.

According to the data in Table 1, the most participation in the study was from Bolu Abant İzzet Baysal University (n=23), and the least from Adnan Menderes (n=1), Bursa Uludağ (n=1) and Sivas Cumhuriyet University (n=1).

Data Collection Tools

To collect quantitative data, the Tendency Scale for Technology Use in Class, developed by Günüç and Kuzu (2014), was used to determine the affective and behavioral tendencies of prospective teachers regarding the use of technology in their lessons. The scale consists of 2 dimensions, affective disposition and behavioral disposition dimensions, and a total of 16 items, 11 items aiming to measure the affective disposition dimension and 5 items aiming to measure the behavioral disposition dimension. The Cronbach's Alpha coefficient for internal consistency reliability regarding the scale was calculated as .93 based on the results of exploratory factor analysis (EFA) and .953 based on confirmatory factor analysis (CFA). A high score from the scale indicates a high tendency towards the use of technology in the course or the use of technology in the course is more preferred.

Another part of quantitative data and qualitative data were collected through the Questionnaire Form on the Technology Use of Prospective Teachers in the Teaching Practice Course, which includes multiple-choice, rated, and open-ended questions developed by the researchers. In the development phase of the survey, after the survey form was prepared, the opinions of 3 experts in the field of music education were sought. After making the necessary adjustments to the form based on expert opinions, a pilot study was conducted by administering the questionnaire to 2 students in the field of music education

Table 1. Distribution of participants by university

University	Female		Male		Total	
	n	%	n	%	n	%
Dokuz Eylül U.	3	3.4	4	4.5	7	8.0
Muğla Sıtkı Koçman U.	13	14.8	5	5.7	18	20.5
Adnan Menderes U.	1	1.1	0	0	1	1.1
Gazi U.	6	6.8	2	2.3	8	9.1
Bolu Abant İzzet Baysal U.	16	18.2	7	8.0	23	26.1
Ondokuz Mayıs U.	2	2.3	6	6.8	8	9.1
Pamukkale U.	2	2.3	0	0	2	2.3
Bursa Uludağ U.	0	0	1	1.1	1	1.1
Sivas Cumhuriyet U.	1	1.1	0	0	1	1.1
Van Yüzüncü Yıl U.	4	4.5	0	0	4	4.5
Trakya U.	7	8.0	3	3.4	10	11.4
Necmettin Erbakan U.	3	3.4	2	2.3	5	5.7
Total	58	65.9	30	34.1	88	100

Based on the recommendations and feedback, necessary adjustments were made, and the last version of the form was prepared. The form consists of a total of 15 questions, including 12 closed-ended questions with multiple choice and rating scales, and 3 open-ended questions. To determine the extent and frequency of technology use by prospective music teachers in the context of teaching practice course, they were asked about their daily use of technology for various purposes, as well as the technological tools and software they use or are familiar with for lesson preparation and in-classroom activities, including music notation programs, digital audio and video editing software, music/hearing education programs, online music platforms, platforms for sharing sheet music, musical works and materials, and general education technologies. In addition, they were asked to rate the frequency of use of these technologies from 0 to 4. 0 means never used, 1 means rarely used, 2 means sometimes used, 3 means usually used, and 4 means always used. To learn the opinions of the prospective music teachers on the use of technology in the practice school within the scope of the teaching practice course, "What are the advantages of using technology in your lessons?", "What are the difficulties you encounter regarding the use of technology?" and "What are your suggestions regarding the use of technology to make practical lessons more effective and efficient?" questions were proposed.

The scale and questionnaire form were made online, and the participants were informed in writing about the purpose and process of the research before the application.

Data Analysis

During the data analysis stage, different analysis methods were used for quantitative and qualitative data. Quantitative data were analyzed using the SPSS program. The Kolmogorov-Smirnov test was used to analyze the data obtained from the scale regarding the general tendency levels of prospective teachers toward the use of technology in the lesson, to find out whether the data showed a normal distribution or not. Kolmogorov-Smirnov assesses the hypothesis that there is no difference between the distribution of the data and the distribution of the population with normal distribution, and a p-value greater than .05 means that normality is achieved (Can, 2013, p. 89). The Cronbach Alpha coefficient was calculated to assess the reliability of the data obtained from the tendency scale for technology use in the course. Reliability in measurements is expressed by the reliability coefficient. The reliability coefficient usually takes a value between 0 and +1, and the closer it gets to 1, the more it means that the reliability increases (Can, 2013, p. 340). To determine the general level of prospective teachers' inclination towards using technology in the classroom, the responses to the scale were analyzed using descriptive statistics. The analysis focused on the affective and behavioral tendencies dimensions, as well as the overall scale averages.

Descriptive statistics were used to analyze the data obtained from the closed-ended questions in the questionnaire. Content analysis was conducted for the answers to the open-ended questions, themes were determined in line with the coding, frequency, and percentage distributions, and sample sentences were included.

Content analysis was applied by listing the opinions of prospective music teachers (n=88) on the advantages of technology use within the scope of teaching practice courses, the difficulties encountered in using technology, and their suggestions regarding the use of technology to make the practice lessons more effective and efficient. In the content analysis process, the stages of coding the data, finding the categories, organizing the data according to the codes and categories, defining and interpreting the findings were followed (Yıldırım & Şimşek, 2021, pp. 251-257).

At the stage of coding the data, considering whether the statements of the prospective teachers were clearly expressed in line with the purpose of the research, the opinions that were the same in meaning were combined with the same code. At the stage of identifying categories, the researchers determined the similar and common features in the expressions of the prospective teachers.

After the categories were determined, both researchers independently matched student opinions and categories. The reliability of the qualitative data analysis was calculated using Miles and Huberman's coding control reliability formula [Reliability = consensus ÷ (consensus + disagreement) × 100], which involved determining the number of agreements and disagreements among the researchers regarding the identified categories. Coding control provides internal control and, in addition to providing clarity in definitions, helps ensure reliability (1994, p. 64).

Consensus reliability values between researchers were calculated as 89% in the data on the advantages of technology use within the scope of the teaching practice course, 93% in the data on the difficulties encountered in the use of technology, and 89% in the data on the suggestions for the use of technology to make the practice courses more effective and efficient. Therefore, it can be said that qualitative data analysis is sufficiently reliable.

Findings

To determine the level of prospective music teachers' tendencies toward using technology in the lesson, the Tendency Scale for the Use of Technology in the Class was applied to the prospective teachers. The Kolmogorov-Smirnov normality test was used to test whether the data obtained from the scale showed normal distribution. According to the test, the data obtained from the tendency scale for the use of technology in the lesson show a normal distribution [p>.05].

The Cronbach Alpha coefficient was calculated to assess the reliability of the data obtained from the tendency scale for technology use in the course. The reliability coefficient of the tendency scale for the use of technology in the lesson, which consists of 16 items, is .96. This result shows that the measurement is quite reliable [.60 ≤ α < .90].

Table 2 shows the distribution of responses given to the scale of the tendency towards the use of technology in the course according to the dimensions of affective disposition, behavioral disposition, and general scale averages.

According to the data in Table 3, the tendency of prospective teachers to use technology in the course is related to the affective dimension, "Using technology in my course responsibilities/homework makes my job easier." the highest item (x̄: 4.22), "I learn better in lessons where technology is used." item (x̄: 3.35) has the lowest mean. Regarding the behavioral dimension, the item "I better listen/follow the lessons where technology is used" is the highest (x̄: 3.45), and "I attend the lessons where technology is used more." item (x̄: 3.29) has the lowest mean.

The questionnaire, which was prepared to determine the technology usage status of prospective music teachers, was answered with the question "For what purposes do you benefit from technology in daily life?" The distribution of the answers provided to the question is given in Table 4.

According to the data in Table 4, prospective teachers use technology the most for communication (n=81), entertainment (f=77), and educational purposes (f=79) in their daily lives; they use it the least for making music (f=1).

Table 2. Distribution of responses to the scale of tendency towards technology use in the lesson

	n	$\bar{x}$	S
Affective disposition dimension	88	3.75	.77
Behavioral disposition dimension	88	3.37	1.14
Overall scale	88	3.63	.84

Table 3. Distribution of the answers given to the scale of the tendency towards the use of technology in the lesson according to the items

Scale Dimensions	Items	$\bar{x}$	S
Affective disposition dimension	I would like to use technology more in the lessons.	3.97	.88
	Lessons using technology are more fun.	3.82	.93
	Using technology in my course responsibilities/assignments makes my job easier.	4.22	.75
	I care more about the lessons where technology is used.	3.35	1.08
	I like communicating with instructors through the Internet.	3.70	1.00
	I learn better in classes where technology is used.	3.36	1.15
	I prefer classes where new/different technologies are utilized.	4.11	.77
	I like sharing information about classes with classmates online.	3.89	.97
	I prefer learning with technology.	3.55	1.12
	I would like technology to be used in every class.	3.57	1.15
	The use of technology in classes increases my interest.	3.71	1.06
Behavioral disposition dimension	I will continue to attend classes where technology is used more.	3.29	1.18
	I am more active in lessons where technology is used.	3.40	1.19
	I am more willing to attend classes where technology is used.	3.40	1.19
	I'm a better listener/follower of the lessons where technology is used.	3.45	1.22
	I attend classes where technology is used more prepared.	3.31	1.21

Table 4. Distribution of responses regarding the use of technology in daily life

Answers	f	%
Communication	81	33,20
Entertainment	77	31,56
Educational Purposes	79	32,38
Doing Research	2	0,82
Making Music	1	0,41
Trade, Financial Gain	2	0,82
Notation Writing, Composing Music	2	0,82
Total	244	100

Table 5. Distribution of answers regarding the use of technological tools and equipment in teaching practice courses

Answers	f	%
Smartboard	81	32,53
Projection	19	7,63
Speaker	53	21,29
Phone-Tablet	52	20,88
Computer	41	16,47
Piano - Electronic Musical Instruments	3	1,20
Total	249	100

Table 6. Distribution of answers given regarding the use of notation programs in teaching practice courses

Answers	f	%
Finale	66	38,82
Sibelius	23	13,53
Musescore	54	31,76
Autoscore	2	1,18
Overture	2	1,18
Flat	3	1,76
Mus2	19	11,18
Maestro	1	0,59
Total	170	100

Table 7. Distribution of responses regarding the use of digital audio and image processing software in teaching practice courses

Answers	f	%
Garageband	60	47,24
Adobe Audition	22	17,32
Noteflight	4	3,15
Hyperscore	5	3,94
Incredibox	4	3,15
Avid Pro Tools	1	0,79
Sound Forge Pro	2	1,57
Steinberg Cubase	5	3,94
Studio One	20	15,75
Bandlab	4	3,15
FL Studio	2	1,57
None/ I don't use	4	3,15
Total	127	100

The distribution of the responses to the question "Which of the following technological tools do you use in the preparation stage and classroom environment for Teaching Practice courses?" in the survey prepared to determine the technology usage status of prospective music teachers is presented in Table 5.

According to the data in Table 5, prospective teachers use the smart board the most (f=81) and the piano-electronic musical instruments (f=3) the least in the preparation phase for the teaching practice lessons and in the classroom environment.

The distribution of the responses to the question "Which notation software programs do you use/know?" in the survey prepared to determine the technology usage status of prospective music teachers is presented in Table 6.

According to the data in Table 6, prospective teachers use or recognize the Finale (f=66) program the most and the Maestro (f=1) program the least.

The distribution of the responses to the question "Which digital audio and video processing software programs do you use/know?" in the survey prepared to determine the technology usage status of prospective music teachers is presented in Table 7.

According to the data in Table 7, prospective teachers use or know Garageband (f=60) the most among digital audio and video processing software programs and use or know Avid Pro Tools (f=1) the least. In addition, 4 prospective teachers stated that they did not use or recognize any of the specified software.

The distribution of the responses to the question "Which music/aural education programs and online platforms do you use/know?" in the survey prepared to determine the technology usage status of prospective music teachers is presented in Table 8.

According to the data in Table 8, prospective teachers use or know Musicplay (f=27) the most among music/aural education programs and online platforms and use or know Harmonic Vision (f=1), QuaverMusic (f=1), MyEar Training (f=1) the least. In addition, 11 prospective teachers stated that they did not use or recognize any of the specified programs or online platforms.

The distribution of the responses to the question "Which notation, music, composition, and material sharing platforms do you use/know?" in the survey prepared to determine the technology usage status of prospective music teachers is presented in Table 9.

According to the data in Table 9, prospective teachers use or know YouTube (f=86) the most among notation, music, composition, and material sharing platforms, and use or know Gootar (f=1), Harmony Central (f=1), IMSLP (f=1), Myt (f=1) the least.

The distribution of the responses to the question "Which general educational technologies do you use or know?" in the survey prepared to determine the technology usage status of prospective music teachers is presented in Table 10.

According to the data in Table 10, prospective teachers mostly use Google Docs (f=59) among general educational technologies and are least familiar with Edmodo (f=2) and Screencastify (f=2). Additionally, 2 prospective teachers stated that they do not use or know any of the mentioned general educational technologies.

To determine the frequency of technology use in the practice school as part of the teaching practice course, prospective music teachers were asked to rate the questions based on a scale of 0 to 4, according to the frequency of use. 0 means never used, 1 means rarely used, 2 means sometimes used, 3 means usually used, and 4 means always used. The distribution of answers regarding the frequency of technology use in teaching

practice courses is given in Table 11. According to the data in Table 11, 31 prospective teachers stated that they rarely use music notation software in the practice school within the scope of the teaching practice course, while 2 of them stated that they always use it. 32 prospective teachers stated that they have never used digital audio and video processing software, while 5 of them stated that they always use it. 37 prospective teachers stated that they have never used music/aural education programs and online music platforms, while 4 of them stated that they always use them. 4 prospective teachers stated that they have never used music notation, music, composition, and material sharing platforms, while 32 of them stated that they always use them.

Additionally, 12 prospective teachers have never used general educational technologies, while 22 of them stated that they use them occasionally. The opinions of prospective teachers (n=88) on the advantages of using technology within the scope of the teaching practice course, the difficulties encountered in the use of technology, and their suggestions on the use of technology to make the practice courses more effective and efficient were listed and content analysis was applied. The categories and subcategories identified by the researchers are presented in Table 12.

According to the data in Table 13, prospective teachers have responded to the advantages of technology usage in the practice school within the scope of the teaching application course. The most common response was that it is facilitative and economical (f=25), while the least common responses were related to its facilitation of the teaching and learning process (f=11) and providing efficient learning (f=11).

The opinions of prospective music teachers regarding the difficulties encountered in using technology within the scope of the teaching application course are presented in Table14.

Table 8. Distribution of responses regarding the use of music/hearing education programs and online platforms in teaching practice courses

Answers	f	%
Musictheory.net	22	17,60
Musicca.com	15	12,00
Make Music	19	15,20
Teoria	3	2,40
Sibelius Ultimate	14	11,20
Ahenk	5	4,00
Harmonic Vision	1	0,80
iScore	16	12,80
Musicplay	27	21,60
Sight read	3	2,40
QuaverMusic	1	0,80
MyEar Training	1	0,80
None/ I don’t use	11	8,80
Total	125	100

Table 9. Distribution of responses regarding the use of musical notes, music, works, and material-sharing platforms in teaching practice courses

Answers	f	%
Youtube	86	26,71
Youtube Music	62	19,25
Spotify	69	21,43
Fizy	20	6,21
Shazam	50	15,53
Music Time	3	0,93
Apple Music	29	9,01
Gootar	1	0,31
Harmony Centra	1	0,31
IMSLP	1	0,31
Myt	1	0,31
Total	322	100

Table 10. Distribution of responses regarding the use of general education in teaching practice courses

Answers	f	%
Google Classroom	46	21,60
Google Documents	59	27,70
Teacher tube	6	2,82
Flip	4	1,88
Kahoot	35	16,43
Edpuzzle	6	2,82
Edmodo	2	0,94
Quizlet	9	4,23
Screencastify	2	0,94
EBA	44	20,66
None	2	0,94
Total	213	100

Table 11. Distribution of answers regarding the frequency of technology use in teaching practice courses

Technologies	Never Used		Rarely Used		Sometimes Used		Usually Used		Always Used	
	n	%	n	%	n	%	n	%	n	%
Note writing programs	25	28.41	31	35.23	23	26.14	7	7.95	2	2.27
Digital audio and video processing software	32	36.36	21	23.86	18	20.45	12	13.64	5	5.68
Music/hearing education programs and online music platforms	37	42.05	15	17.05	20	22.73	12	13.64	4	4.55
Note, music, work, and material-sharing platforms	4	4.55	15	17.05	15	17.05	22	25	32	36.36
General education technologies	12	13.64	17	19.32	22	25	21	23.86	16	18.18

Table 12. Categories and sub-categories were obtained from the answers regarding the use of technology in teaching practice courses.

Questions	Categories	Sub-Categories
Advantages of using technology	Advantages of the learning-teaching process	Enriching the learning-teaching process Facilitating the learning-teaching process Providing learning motivation Providing efficient learning
	General advantages of using technology	Providing time-saving Being facilitative and cost-effective
Challenges in the use of technology	Technological and technical hardware challenges	Problems with the internet connection, power outage Problems with technological hardware in the classroom environment Problems with accessing electronic resources Lack of information about technological and technical equipment Lack of school facilities
	Difficulties in the learning-teaching process	Interruption of the learning-teaching process with advertisements Distraction of students Preference for the traditional approach Problems with the reliability of the information
Recommendations on the use of technology	Recommendations on technological and technical equipment	Solving internet connection problems Provision/improvement of technological and technical equipment Providing economical technological equipment
	Suggestions on the learning-teaching process	Enrichment of technology-supported course content Effective/efficient use of technology in the learning and teaching process
	Recommendations for training on technology use	Providing training to prospective teachers and in-service teachers on the use of technology

Table 13. Distribution of responses regarding the advantages of using technology in teaching practice courses

	Categories	Sample answers	f	%
Advantages of the learning-teaching process	Enriching the learning-teaching process	When I need to make a video presentation, I can provide more examples (P11). It provides diversity in teaching methods, allows for fun activities during lessons, and increases adaptation by providing visual and sensory stimuli (P20). It appeals to students' perceptions in many ways and allows for examples to be seen from different angles (P26). ...I believe that it is quite advantageous for improvisation and being able to do fun activities (P30).	18	19.57
	Facilitating the learning-teaching process	Practically, it speeds up the flow of the lesson, which provides ease of learning for both me and the students (P15). Teaching through interactive whiteboards is much easier than writing everything on the board (P80). Being able to access a book from the internet when children have a shortage of books or materials prevents the child from falling behind (P81).	11	11.96
	Providing learning motivation	It attracts more attention and increases memorability (P34) Using technology in applied classes makes students more willing to participate in the lesson (P35) I think it is advantageous to access information or to attract students' attention visually that cannot be obtained from books (P41) The lesson becomes more interesting with technology (P44) Classes are more productive as it attracts students' attention (P66)	13	14.13
	Providing efficient learning	The lessons make the learned knowledge more permanent (P27) More consolidation is provided, for example (P39) I think children understand better (P73) I find it useful in terms of appealing to multiple senses (P81)	11	11.96
General advantages of using technology	Providing time-saving	Quick content sharing (P5) Instant access to information (P9) Finding and playing notes and compositions is easier and quicker (P21) I can use my time more efficiently (P48) Examples can be shown more quickly (P79)	14	15.22
	Being facilitative and economical	It provides convenience by showing and playing everything we cannot reach visually or auditorily (P31) It is more economical (P32) Since there was no piano in the school where I did my internship, I am currently opening a virtual piano from the smart board (P38) ...we are not wasting things like paper (P63)	25	27.17
		Total	92	100

The opinions of prospective music teachers about the advantages of using technology within the scope of the teaching practice course are listed in Table 13. According to the data in Table 14, prospective teachers have given the most responses regarding the difficulties encountered in the use of technology in the application school within the scope of the teaching practice course on internet connection problems (f=21), and the least responses regarding the reliability of information (f=1).

The views of prospective music teachers on the recommendations for using technology to make the application lessons more effective and efficient within the scope of the teaching practice course are included in Table 15. According to the data in Table 15, prospective teachers have provided the most suggestions regarding technology use to make their practical lessons more effective and efficient in the context of the teaching practice course, related to providing/improving technological and technical equipment (f=13), enriching technology-supported course content (f=13), and the least related to providing economical technological equipment (f=4) and ensuring efficient learning (f=11).

Table 14. Distribution of responses regarding the difficulties encountered in using technology in teaching practice courses

	Categories	Sample Answers	f	%
Technological and technical hardware challenges	Problems related to internet connection	There may be difficulties with the smart board or the internet in schools. (P6) The slowness or weakness of the internet... (P18) Insufficient internet speed... (P43) The smart board cannot be opened due to internet problems in schools. (P66)	21	28.0
	Power cut	…everything goes in case of a power cut (P55) Power cut… (P84)	3	4.0
	Problems with technological hardware in the classroom environment	Smart board's touch problem (P10) Cannot see the slide I prepared on the smart board (P11) Smart boards are commonly used in classrooms and unfortunately, they do not function properly (P19) Insufficient performance of hardware in meeting the function (P37)	15	20.0
	Problems with accessing electronic resources	…unable to access some applications (P25) ...the presence of internet restrictions... (P43)	12	16.0
	Insufficient knowledge related to technological and technical equipment	Unfamiliarity with technical equipment at a good level sometimes creates difficulties and affects this workflow (P15) I don't understand the use of technological devices (P28) Lack of technology and not knowing how to use music software properly (P80) I am not knowledgeable because I do not use it very often and I do not know how to use it properly. This is challenging (P88)		
	Lack of school facilities	The insufficient technological infrastructure of the school (P27) In music education, I can say that the requirement for the teacher to provide technological products other than smart boards is difficult (P30) ...the shortcomings of the school. The fact that there is no smart board in every classroom (P65)	10	13.33
Difficulties in the learning-teaching process	Interruption of the learning-teaching process with advertisements	"... online advertisements are among the encountered difficulties (P44) ... advertising problems when applied via YouTube (P50)"	3	4.0
	Distraction of students' attention	The distraction of focus and decrease in the workability of the lesson (P20) Students' thinking that technology is just for fun (P56) Faster deterioration of attention in the classroom (P79)	8	10.67
	Preference for the traditional approach	Our practice teacher's use of traditional methods (P26) Since the average age of teachers is quite high, they naturally have difficulties in using technology actively. This prevents us from taking full advantage of technology. (P72)	2	2.67
	Problems with the reliability of the information	I may not always have the right information (P69)	1	1.33
		Total	75	100

Table 15. Distribution of responses on recommendations for using technology to make teaching practice lessons more effective and efficient

	Categories	Sample Answers	f	%
Recommendations on technological and technical equipment	Solving internet connection problems	Better internet speed, better infrastructure, and unrestricted internet (P43) The internet strength and speed in schools being at a very good level (P66)	5	8.06
	Provision/improvement of technological and technical equipment.	...the equipment in the classroom can be improved (P38) ...there should be easily accessible information technologies in all institutions and classrooms (P48) Having smart boards and pianos (P73) There should be more access to electronic resources (P87)	13	20.97
	Providing economical technological equipment	Use more affordable and accessible technological devices (P33) Paid software for teachers can be made free... (P38) Free access to music applications on smart boards... (P70)	4	4.45
Suggestions on the learning-teaching process	Enrichment of technology-supported course content	Creating content consisting of applications and activities that appeal to students' interests and presenting them to students (P24) Preparing videos and visuals suitable for the content of the lesson (P55), Designing an application for music education (P78) Using educational examples that appeal to different age groups, such as books, notes, and supporting and complementary educational videos or audio files (P81)	13	20.97
	Effective/efficient use of technology in the teaching/learning process	Using technology for activities and resources to make the subject more interesting and increase the student's desire to learn (P20) Technology should be used efficiently and appropriately (P43) Using technology in a way that is appropriate for the subject and purpose of the lesson (P50)	12	19.35
Recommendations for technology-related education.	Providing education on technology use to prospective and in-service teachers	Seminars can be held or practical courses can be added to the curriculum for our university teachers and us prospective teachers to gain more knowledge about the relevant technological applications in our field and how they should be applied in classes. (P27) Technology should be used more effectively, and extra classes can be given to students regarding the programs used. (P34) Teaching teachers about simple-to-use programs could be one way to improve technology use. (P61) Information about technology should be given to subject teachers. (P71)	15	23.58
		Total	62	100

Conclusion, Discussion and Recommendations

The important conclusions reached in line with the research findings are as follows:

It has been concluded that the tendencies of the participant prospective music teachers regarding the use of technology in the lesson are generally at an above-average level.

When looking at the items of the Scale of Tendency towards the Use of Technology in the Classroom, which consists of 16 items, it is observed that the average of two items is at a good level: These are the items "Using technology in class responsibilities/homework makes my work easier" and "I want new/different technologies to be used in classes" which are located in the affective dimension of the scale. These results parallel the qualitative findings of the research, and although prospective teachers have a positive tendency towards the use of technology, it can be said that their implementation rates are low in accordance with the data on the frequency of technology use in practical classes.

It is noteworthy that the recognition and frequency of use of music/aural education programs and online platforms are below average among all technological software. It is observed that a significant portion, such as 42.05% of the participants, reported that they have never used this software. In a relevant study, Kürün (2017) emphasized the necessity of a license course content related to software for increasing the recognition and usage rates of software among music education students.

Among the most used or recognized technological tools in teaching practice classes, smart boards stand out first, followed by speakers and phones/tablets. In a study conducted with prospective science teachers' similar purposes (Çelik et al., 2021), it is observed that participants expressed that smart boards, phones/tablets, and computers should be among the technological equipment that should be present in an ideal classroom, and they argued that lessons could be more enjoyable and effective through these devices. In a study conducted with students in the primary school teaching and science teaching departments (Korkmaz & Korkmaz, 2015), it was found that participants had a positive view on the importance of using smart boards. In the same study, the emphasis on providing education on the use of smart boards in undergraduate courses gains meaning in this direction.

Based on the data gathered regarding the views of prospective music teachers on technology use in application school within the scope of the teacher training course, the prospective teachers emphasized the advantages of technology as a facilitator, being economical, and providing efficient learning. They also mentioned facing problems related to inadequate technological equipment and internet connection in the classroom and suggested that the technological equipment in the classrooms should be improved, the content of the lessons should be enriched with technology, and technology should be used effectively in the lessons. Furthermore, the most prominent suggestion was the necessity of training prospective and in-service teachers on the use of technology.

In his research, Haning (2016) stated that music education students are more open to receiving further education on technology, and emphasized the necessity of including technology usage in music education undergraduate programs and creating additional learning opportunities through various courses. Namdar and others (2017) have conducted research with music teachers for similar purposes, and among the recommendations of the participating teachers, the importance of providing seminars on technology use and necessary equipment for increasing the effectiveness of lessons stands out as important.

According to Lehman (2020), in parallel with the findings of this research on the difficulties encountered in using technology in music education, he emphasizes the problems music educators face in terms of materials, hardware, and administrative support and states that three issues will be particularly important in the future of education: financial resources, technology, and professional development. Stevens (2018), not only emphasizes the provision of technological equipment to schools but also mentions the importance of including music technology in prospective training and professional development programs. In addition, Stevens emphasizes the importance of teachers' competencies, orientations, and motivations in this process. To ensure a learning environment that utilizes information and education technologies, it is necessary for music educators and prospective teachers to undergo educational processes such as prospective and in-service training, and to continue their professional development afterward. One of the problems may be that students may not be sufficiently exposed to the pedagogical aspect and integration of information and communication technologies (ICT) during their prospective period (Brown & Warschauer, 2006). The difficult but necessary thing may be to move technology in music education from an "add-on" position to an embedded position in the curriculum (Wise et al., 2011).

Dorfman (2016), emphasizes the importance of collaboration between relevant institutions and teachers, as well as providing opportunities for in-service training, to reduce music educators' concerns about planning, collaboration, and support related to technology use and to help them establish a more comfortable relationship with technological equipment.

There is a strong connection between music and technology. Music educators who can bring this connection to the learning environment must also have a critical awareness of technology as an important part of their current social identity (Lines, 2015). In addition to individual efforts, institutional efforts are also necessary for the development of this awareness. Music educators who can use evolving technology correctly and efficiently

can shape the future of music learning and teaching and take it further.

Based on the research results, the following recommendations can be made:

- As part of the prospective training planning, elective or mandatory undergraduate courses can be created that focus on the effective use of various music software and technological equipment to utilize technology more effectively in practice schools.
- Seminars, workshops, and courses focused on the use of technology can be planned for undergraduate students studying in music education departments.
- During teaching practice courses, lesson plans focused on using technological equipment and software effectively and in parallel, with course content can be developed. ·
- In collaboration with schools and teachers where teaching practice courses are conducted, activities and in-service training sessions focused on the proper and efficient use of technology can be organized.

Genişletilmiş Özet

Giriş

İçinde yaşadığımız çağda en hızlı üretilen, en hızlı ulaşılan ve pek çok farklı kanal aracılığıyla erişilebilen ürünlerden birinin bilgi olduğu söylenebilir. Bunun başlıca nedenleri arasında, teknolojide yaşanan gelişmeler yer almaktadır. Günlük yaşamlarımızda da önemli bir alan kaplayan teknoloji, eğitim sisteminin yeniden yapılandırılması için teknolojiyi kullanma yönünde uzmanları, eğitimcileri ve öğrencileri temel inançları üzerinde tekrar düşünmeye yönlendirmektedir. İlgili donanımlar da, öğretmenlerin ve öğrencilerin eğitsel süreçlerde teknolojiden daha fazla yararlanabilmesi için önemli rol oynamaktadır (Basak, Wotto & Belanger, 2018, s. 191).

Bilimsel çalışmalara da sıkça konu olan ve farklı çalışma alanlarında araştırma bulgularıyla da desteklenen bir öneme sahip olan eğitimde teknoloji kullanımı, günümüz öğrencilerinin teknolojiyle iç içe yaşantısı düşünüldüğünde bir tercih değil gereklilik halini almaktadır. Tüm öğrenme alanlarında olduğu gibi çağdaş müzik eğitiminde de, özellikle son yıllarda ivme kazanan teknolojik gelişmeler ve Covid-19 pandemi sürecinin eğitim hayatına olumsuz yansımalarını azaltma çabasındaki teknolojik arayışlar, dijital öğrenme ortamlarını, araç-gereçlerini ve platformlarını daha da öne çıkarmıştır.

Bu doğrultuda bu araştırmanın amacı, müzik öğretmeni adaylarının teknoloji kullanımına yönelik eğilimlerini, "öğretmenlik uygulaması" dersi kapsamında okul ortamında yürüttükleri müzik dersi uygulamalarında teknoloji kullanım durumlarını ve buna yönelik görüşlerini ortaya koymaktır.

Yöntem

Karma yöntemin izlendiği bu araştırma, eş zamanlı çeşitleme desenindedir. Araştırmanın katılımcı grubunu Türkiye'deki 12 devlet üniversitesine bağlı müzik öğretmenliği programlarında öğrenimine devam eden, Öğretmenlik Uygulaması 1 dersini almış olan ve araştırmaya gönüllü katılım gösteren 58'i kadın, 30'u erkek toplam 88 öğrenci oluşturmaktadır.

Nicel verilerin toplanmasında Günüç ve Kuzu (2014) tarafından geliştirilmiş olan Derste Teknoloji Kullanımına Yönelik Eğilim Ölçeği kullanılmıştır. Ölçek, duyuşsal eğilim ve davranışsal eğilim boyutları olmak üzere 2 boyuttan ve 11 maddesi duyuşsal eğilim boyutunu, 5 maddesi davranışsal eğilim boyutunu ölçmeyi amaçlayan toplam 16 maddeden oluşmaktadır. Nicel verilerin bir diğer kısmı ve nitel veriler ise araştırmacılar tarafından geliştirilen çoktan seçmeli, derecelendirmeli ve açık uçlu soruların yer aldığı Öğretmen Adaylarının Öğretmenlik Uygulaması Dersinde Teknoloji Kullanım Durumlarına İlişkin Anket Formu aracılığıyla toplanmıştır. Toplam 15 sorudan oluşan formda, çoktan seçmeli ve derecelendirmeli olmak üzere 12 kapalı uçlu soru ve 3 açık uçlu soru yer almaktadır.

Öğretmen adaylarının derste teknoloji kullanımına yönelik genel eğilim düzeylerine ilişkin ölçekten elde edilen verilerin çözümlenmesinde verilerin normal dağılım gösterip göstermediğini bulgulamak amacıyla Kolmogorov-Smirnov testinden yararlanılmıştır. Derste teknoloji kullanımına yönelik eğilim ölçeğinden elde edilen verilerin güvenirliğini test etmek amacıyla Cronbach Alfa katsayısı hesaplanmıştır.

Anket formundaki kapalı uçlu sorulardan elde edilen verilerin analizi için betimsel istatistikler kullanılmıştır. Açık uçlu sorulara verilen yanıtlar için ise içerik analizi yapılmış, kodlamalar doğrultusunda temalar belirlenmiş, bunlara ilişkin sıklık ve yüzde dağılımlarına ve örnek cümlelere yer verilmiştir.

Sonuç

Araştırma bulguları doğrultusunda ulaşılan önemli sonuçlar şu şekildedir:

Katılımcı müzik öğretmeni adaylarının derste teknoloji kullanıma ilişkin eğilimlerinin genel olarak orta üstü bir seviyede olduğu sonucuna ulaşılmıştır. 16 maddeden oluşan Derste Teknoloji Kullanımına Yönelik Eğilim Ölçeği'nin maddeleri özelinde bakıldığında ise, iki maddenin ortalamasının iyi seviyede olduğu gözlemlenmiştir: Bunlar, ölçeğin duyuşsal boyutunda yer alan "Ders sorumluluklarında/ödevlerinde teknolojiyi kullanmak işimi kolaylaştırır." ve "Derslerde yeni/farklı teknolojilerin kullanılmasını isterim." maddeleridir. Bu sonuçlar, araştırmanın nitel bulgularıyla paralellik taşıyor ve öğretmen adayları teknoloji kullanımına yönelik olumlu bir eğilim içinde bulunuyor olsalar da, uygulama derslerinde teknolojiyi kullanım sıklıklarına ilişkin veriler doğrultusunda bunu eyleme geçirme oranlarının düşük olduğu söylenebilir.

Tüm teknolojik yazılımlar içinde özellikle müzik/işitme eğitimi programları ve çevrimiçi platformların tanınma

oranının ve kullanım sıklığının ortanın altında bir seviyede oluşu dikkat çekmektedir. Katılımcıların %42.05 gibi önemli bir kısmının bu yazılımları hiç kullanmadıklarını belirttikleri görülmektedir. İlgili bir araştırmada Öğretmenlik uygulaması derslerinde en çok kullanılan ya da tanınan teknolojik araç-gereçler içinde akıllı tahta ve daha sonra hoparlör ve telefon-tablet öne çıkmıştır.

Müzik öğretmeni adaylarının öğretmenlik uygulaması dersi kapsamında uygulama okulunda teknoloji kullanımına ilişkin görüşleri, teknolojinin her anlamda kolaylaştırıcı olma, ekonomik olma ve verimli öğrenmeyi sağlama avantajlarını vurgulamış; sınıf ortamında en çok internet bağlantısıyla ve teknolojik donanımların yetersizliği ile ilişkili sorunlara yönelik olmuştur. Katılımcıların önerileri, sınıflardaki teknolojik donanımların iyileştirilmesi, ders içeriklerinin teknolojik anlamda daha zengin hale getirilmesi ve teknolojinin derslerde verimli kullanılmasına yönündedir. Ancak en çok öne çıkan öneri, öğretmen adayları ve öğretmenlere teknoloji kullanımına ilişkin eğitim verilmesi gerekliliği olmuştur.

Tartışma

Araştırmanın müzik eğitiminde teknoloji kullanımına yönelik yaşanan güçlüklere ilişkin bulgularına paralel olarak Lehman da (2020), malzeme, donanım ve idari destek konularında müzik eğitimcilerinin yaşamakta olduğu sorunlara vurgu yapmakta ve geleceğin eğitiminde özellikle 3 konunun öne çıkacağını belirtmektedir: finansal kaynak, teknoloji ve mesleki gelişim. Yalnızca okullara teknolojik donanımların sağlanmasının değil, hizmet öncesi eğitimlerde ve mesleki gelişim programlarında da müzik teknolojisinin yer almasının bir gereklilik olduğu söylenebilir. Bunun yanında, öğretmenlerin bireysel yeterlik, yönelim ve motivasyonları da bu süreçte önem kazanır. Bilgi ve eğitim teknolojilerinin kullanıldığı bir öğrenme ortamının sağlanması için, öncelikle müzik eğitimcilerinin ve öğretmen adaylarının hizmet öncesi ve hizmet içi eğitim gibi eğitsel süreçlerden geçmeleri ve sonrasında da mesleki gelişimlerini devam ettirmeleri gerektiğinden söz edilebilir (Stevens, 2018). Çünkü sorunlardan biri, öğrencilerin hizmet öncesi dönemde bilgi ve iletişim teknolojilerinin (BİT) pedagojik yönüne ve entegrasyonuna yeterince maruz kalmayışı olabilir (Brown & Warschauer, 2006). Zor ancak gerekli olan şey, "müzik eğitiminde teknolojiyi 'eklenti' konumundan müfredata gömülü bir konuma taşımak" olabilir (Wise et al., 2011).

Dorfman (2016), ilgili kurumlar ve öğretmenler arasında işbirliğine ve hizmet içi eğitim olanaklarına önem verilmesinin, müzik eğitimcilerinin teknoloji kullanımına ilişkin planlama, işbirliği ve destek konularındaki kaygılarını azaltacağı ve teknolojik donanımlarla daha rahat ilişki kurabilecekleri görüşündedir.

Müzik ve teknoloji kuvvetli bir bağ içindedir. Bu bağı öğrenme ortamına taşıyabilecek müzik eğitimcilerinin ise, günümüzdeki toplumsal kimliklerinin önemli bir parçası olarak teknolojiye ilişkin eleştirel farkındalığı da önemli bir gerekliliktir. (Lines, 2015). Bu farkındalığın gelişimi için bireysel çabaların ötesinde kurumsal çabalar da gerekmektedir. Gelişen teknolojiyi doğru ve verimli şekilde kullanabilen müzik eğitimcileri, geleceğin müzik öğrenimi ve öğretimine yön verebilir, onu daha ileriye taşıyabilirler.

Öneri

Araştırma sonuçları doğrultusunda şu öneriler getirilebilir:

- Hizmet öncesi eğitim planlaması dâhilinde farklı müzik yazılımlarının ve teknolojik ekipmanların kullanımına ilişkin, uygulama okullarında teknolojiden daha etkili şekilde yararlanmaya odaklı seçmeli ya da zorunlu lisans dersi içerikleri oluşturabilir.
- Müzik eğitimi bölümlerinde öğrenim gören lisans öğrencilerine yönelik teknoloji kullanımı odaklı seminer, atölye ve kurslar planlanabilir.
- Öğretmenlik uygulaması derslerinde, ders içerikleriyle paralel ve onları zenginleştirecek şekilde teknolojik donanım ve yazılımlardan yararlanmaya odaklı ders planlamaları yapılabilir.
- Öğretmenlik uygulaması derslerinin yürütüldüğü okul ve öğretmenlerle işbirliği içinde, derslerde teknolojinin doğru ve verimli kullanımına dönük çalışmalar, hizmet içi eğitimler yapılabilir.

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