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Abstract

Technology integration is the use of appropriate technology in line with the objectives set in the learning-teaching process. Teachers who carry out learning and teaching activities in schools have a great importance in technology integration. In this study, it was aimed to investigate the music teachers' perceived self-efficacy for technology integration. Technology integration self-efficacy perceptions of music teachers were compared based on the variables of gender, age, school type and level. The participants of the research consisted of 216 music teachers working in different cities in Turkey. Personal information form and perceptions of self-efficacy for technology integration scale were used in the research. The research findings indicated that music teachers' perceived self-efficacy for technology integration were moderate. In addition, their perceived self-efficacy differed based on gender, age and school type. In general, male music teachers and the teachers working with younger students and in private schools had significantly higher perceived self-efficacy for technology integration.

Introduction

Art teachers help their students develop in all learning areas, especially in equipping themselves with artistic and aesthetic sensitivity, artistic knowledge, skills and values. In addition, students should try to develop their aesthetic and artistic potential, values, interests and attitudes and to ensure that they are active in their artistic activities and processes at a universal level (Brewer, 1999; Galbraith, 1997; Kara, 2020a; Muijs et al 2014; Unrath & Kerridge, 2009; Unrath, Anderson & Franco, 2013; Stokrocki, 1986; Wright & Leong, 2017).

Today, the methods and techniques used in traditional education have been replaced by the methods and techniques suitable for contemporary education supported by technological tools and equipment. Teacher and subject-centred approaches have been replaced by student and practice-centred approaches. The tools and materials developed by using instructional technologies were combined with student-centred methods and techniques to make the subjects more meaningful for learners. The inadequacy of traditional teaching has led to the search and implementation of new approaches by educational scientists because the "information society" seeks alternative approaches to traditional teaching (AlAhmad, 2021; Alan, 2019; Bas & Kivilcim, 2018; Hebecci & Alan, 2017; Kibici, 2022a; Woods et al 2021). In the century we live in, the accuracy of information changes in a very short time. In order to keep up with this change, it is necessary to train creative thinkers

instead of individuals with template thinking. In addition, there are individual differences in education. The way each student acquires musical knowledge and skills may differ. Thus, it is recommended to use technology effectively in music teaching at primary and secondary school levels (Alan & Sünbül, 2010; Kibici, 2022b).

According to Fu (2013), technology integration is a powerful tool of change and learning can take place anywhere and anytime. In addition, these environments are student-centred environments that provide social learning and self-management as well as providing one's own learning. When the literature is reviewed, it is seen that the factors affecting technology integration can be classified under five main headings. These are (a) hardware and network infrastructure, (b) support, (c) teacher's competence and education, (d) perceptions and attitudes, and (e) time and heavy workload (Abu Karsh, 2018; Almekhlafi & Almeqdadi, 2010; Chen, 2010; Fu, 2013; Inan & Lowther, 2010; Liang, 2021; Peled & Perzon, 2021; Sang, Valcke, vanBraak & Tondeur, 2010; Teo et al, 2008; Teo, 2011). The integration process not only requires the teacher to play an active role in the classroom, but also provides convenience to the teacher in terms of making students understand the process easier (Şendurur & Arslan, 2017).

With the contribution of technological applications in music education; different kinds of information can be blended and it is possible for different cultures to interact with each other in the digital world. Visual and audio materials can be used as a whole with such applications. In this way, it is possible to reach musical goals easily for a short time. Making the music lesson easily applicable with instructional technology applications, integrating it into existing teaching processes and interacting with it will make significant contributions to this field (Beckstead, 2001; Cain, 2004; Kaleli, 2021; Kemp, 1986; Kibici, 2022b; Kilincer, 2021; Kim, 2013; Koh, Chai & Tsai, 2013).

In music education, teachers largely carry the burden of teaching practices based on instructional technologies. Examining the competences, skills and experiences of music educators working at different school levels in Turkey is critical for understanding the changing and evolving needs of music education. It has been found that teacher competence is considered as an important concept that represents the professional identity of teachers and teacher candidates (Hebebe, Bertiz & Alan, 2020; Kara, 2020; Yeşilyurt, 2011). An individual's self-efficacy belief determines the time, effort and effort he or she will spend to achieve a task (Schunk & Pajares, 2009; Schunk & Zimmerman, 2006; Yurt, 2014). Therefore, the efficacy beliefs held by teachers against the tasks they need to accomplish in and out of the classroom can determine their performance.

Individuals with high self-efficacy beliefs towards the teaching profession believe that they can demonstrate the necessary behaviors for effective teaching. These individuals are competent in choosing and applying appropriate teaching methods that will increase the success of students (Akar, 2011). Professional self-efficacy of teachers; It has been stated that it is closely related to classroom management skills, subject area knowledge, ability to choose effective methods and techniques, ability to use instructional technologies, student success, time allotted for teaching, effort spent for students' success, and the level of motivating students (Corry & Stella, 2018; Dellinger et al 2008; Kaleli, 2020; Kurt, 2012; Leslie, 2011; Ünlü et al 2008; Woolfolk & Hoy, 1990).

In the literature, there are various studies investigating the effect of bringing developing technologies into the classroom on learning (Goos & Bennison, 2008; Kaleli, 2020; Koyuncuoğlu, 2021; Liao, 2007). It is clear from

these studies that the use of technology in education can be used for various purposes, from teachers' keeping records of student to the evaluation of students. However, considering the integration of technology into education, it is seen that this is a dynamic, complex and somewhat slow process (Harris & Hofer, 2009; Harris, Mishra & Koehler, 2007). Teachers, students, institutional policies and technology itself, etc. are all involved in the process. The fact that there are different variables, including teachers, students, institutional policies and technology itself, etc., is an element that increases this complexity. In addition, it is necessary to realize that teachers' ability to use technology and their ability to use technology pedagogically are different from each other. As a matter of fact, it has been found that teacher candidates studying at education faculties in the USA attach more importance to developing their technological knowledge rather than developing their Technological Pedagogical Content Knowledge (Kariuki & Duran, 2004). It can be stated that a similar approach is valid for Turkey as well. From this point of view, it is stated that in recent years, research has focused on how teachers will improve their technological knowledge and how they use technology in the classroom to ensure permanent learning among students (Kaya & Yılayaz, 2013). However, many of these studies (Roblyer, 2006; Zhao & Cziko, 2001) offer some principles on how teachers can improve themselves in order to transfer technology into practice in the classroom. In addition, it can be stated that the studies conducted to determine teachers' self-efficacy perceptions of technology integration are not at a level to meet the needs. Successful technology integration should not be seen as a mechanical and one-way process, but rather as a multi-faceted and mutual interaction, in terms of individual, behavior and environment, by adapting to technology at an individual and institutional level. Self-efficacy of teachers should also be considered as an important factor in the management of this process. In Turkey, it is stated that there are problems in technology integration competencies of teachers in general and music teachers in particular. For this purpose, it was aimed to examine the technology integration skills of music teachers based on the variables of gender, age, school type and level.

Method

This research paper began with the identification of the focused problem first. Basic theories, research and literature were reviewed in the process of determining the problem of secondary school and high school music teachers' technology integration skills. After deciding on the research topic " self-efficacy for technology integration" in general terms, the literature was reviewed to determine the boundaries of the content, and a framework was created based on the sub-questions related to the research. As a result of these processes, a comparative survey model was used to investigate the technology integration self-efficacy of secondary and high school music teachers based on some variables. Within the framework of this model, firstly, participant music teachers' perceptions of technology integration self-efficacy were described, and these were analysed comparatively based on gender, school type and age.

Participants

The participants were determined online due to the Covid-19 Pandemic. First of all, an online questionnaire form was prepared, in which voluntary participation in the study was approved and started. Personal Information Form and self-efficacy for technology integration scale were added to this file. The participants,

who taught music lessons in private or public schools, graduated from education faculty and could use computers and mobile phones, were selected for this study. The online scale link was shared with the social media groups of secondary and high school music teachers. The questionnaire was shared online for 1 month. Thus, data were obtained from 222 teachers who taught music lessons in secondary and high schools. Within the scope of the data obtained from the demographic information form, it was understood that 6 of the participating music teachers did not graduate from the relevant field, so their answers were excluded from the analysis. Therefore, the study was conducted with 216 secondary and high school music teacher participants based on the principles of convenience sampling. The distribution of demographic data of music teachers is given in Table 1.

Table 1. Distribution of Demographic Data of Music Teachers

Gender	Frequency	%
Male	95	44.0
Female	121	56.0
Age		
20-29	64	29.6
30-39	42	19.4
40-49	70	32.4
50 - Upper	40	18.5
School Type		
State School	135	62.5
Private School	81	37.5
School Level		
High School	101	46.8
Secondary School	115	53.2
Total	216	100.0

Measuring Tool

In this study, a personal information form and a Likert type scale were used to measure secondary and high school music teachers' perceived self-efficacy for technology integration. Personal Information Form was used as a data collection tool in order to obtain information about teachers' gender, seniority, age, etc. In addition, the Technology Integration Self-Efficacy Scale, which was developed by Wang, Ertmer and Newby (2004) and adapted into Turkish by Ünal and Teker (2018), a 5-point Likert scale with 19 items in total was used. According to Yurt and Sünbül (2014), the Cronbach Alpha (Alpha: α) value should be 0.70 or higher for the scales to be reliable. Since the reliability coefficient of the scale used was greater than 0.70, it could be stated that the scale was reliable and served the purpose of the research. The lowest score that could be obtained from the scale was 19, and the highest score was 95. It can be interpreted that the higher the scores obtained from the scale show the higher technology integration self-efficacy perception, while the lower the scores indicate the lower technology integration self-efficacy perception.

Data Analysis

Before the analysis of the data obtained from the technology integration self-efficacy scale, it was examined whether the data followed normal distribution or not, considering the kurtosis and skewness coefficients. Thus, it was seen that the kurtosis and skewness values of the dependent and independent variables of the study were between -2 and +2, and it was assumed that the scores of the technology integration self-efficacy scale followed a normal distribution. In the analysis of the data, t-test was used to determine technology integration self-efficacy perceptions of the music teachers participating in the research based on gender, school type and level, and ANOVA (one-way analysis of variance) was used to determine the technology integration self-efficacy perceptions of the participants based on the variable of age.

Findings

Findings Related to the First Sub-Question

The first sub-question of the study was "What is the level of music teachers' perceived self-efficacy for technology integration?" The data obtained from the scale for this question were analysed with descriptive analysis techniques. Table 2 shows the mean values and standard deviations of the data obtained from the participants' scores on technology integration self-efficacy scale. According to the analyses, the participants mean score in 'Self-Efficacy for Teaching Computer Technologies' dimension of the scale was 3.45 ± 0.71 , their mean score in 'Self-Efficacy for Using Computer Technologies' dimension of the scale was 3.30 ± 0.55 and the total mean score in 'Self-Efficacy for Technology Integration' was 3.37 ± 0.46 . These findings indicated that the participating music teachers' perceptions of self-efficacy for technology integration were moderate.

Table 2. Descriptive Analysis of Music Teachers' Perceived Self-efficacy for Technology Integration

	N	Minimum	Maximum	Mean	Std. Deviation
Self-Efficacy for Teaching Computer Technologies	216	1	5	3.45	0.71
Self-Efficacy for Using Computer Technologies	216	2	5	3.30	0.55
Self-Efficacy for Technology Integration	216	2.1	4.5	3.37	0.46

Findings Related to the Second Sub-Question

The second sub-question of the study was "Do music teachers' perceived self-efficacy for the technology integration differ based on gender?" The data obtained from the scale to answer this sub-question were analysed with the independent sample t-test. Table 3 shows that there was no significant gender-related difference in the 1st factor and music teachers' self-efficacy perceptions of technology integration total mean scores ($p > 0.05$). However, in the second dimension of the scale, a significant difference was found between the mean scores on "Self-Efficacy for Using Computer Technologies" based on the variable of gender. Male music teachers' scores on self-efficacy of Using Computer Technologies were significantly higher.

Table 3. Music Teachers' Perceived Self-Efficacy for Technology Integration based on Gender

	Gender	N	Mean	Std. Deviation	t	p
Self-Efficacy for Teaching	Female	121	3.54	0.71	1.73	0.08
Computer Technologies	Male	95	3.37	0.70		
Self-Efficacy for Using	Female	121	3.18	0.48	-2.85	0.00
Computer Technologies	Male	95	3.39	0.58		
Self-Efficacy for	Female	121	3.36	0.44	-0.35	0.73
Technology Integration	Male	95	3.38	0.48		

Findings Related to the Third Sub-Question

The third sub-question of the study was “Does the music teachers’ perceived self-efficacy for technology integration differ based on school type?” The data obtained from the scale to answer this question were analysed with the independent sample t-test. Table 4 shows that music teachers’ perceived self-efficacy for technology integration differed significantly in both sub-dimensions and total scores based on school type. Regarding the mean scores of the groups, self-efficacy for technology integration perceptions of music teachers working in private schools was significantly higher.

Table 4. Comparison of Music Teachers' Perceived Self-Efficacy for Technology Integration based on School Type

School Type	School Type	N	Mean	Std. Deviation	t	p
Self-Efficacy for Teaching	State School	135	3.27	0.66	-4.87	0.00
Computer Technologies	Private School	81	3.73	0.68		
Self-Efficacy for Using	State School	135	3.20	0.51	-3.71	0.00
Computer Technologies	Private School	81	3.48	0.57		
Self-Efficacy for	State School	135	3.24	0.39	-6.18	0.00
Technology Integration	Private School	81	3.60	0.48		

Findings Related to the Fourth Sub-Question

The fourth sub-question of the study was “Does music teachers’ perceived self-efficacy for technology integration differ based on School Level?” The data obtained from the scale to answer this question were analysed with the independent sample t-test. Table 5 shows that music teachers’ perceived self-efficacy for technology integration did not show a significant difference based on the grade level ($p > 0.05$). Self-efficacy for technology integration of the secondary and high school music teachers participating in the research were at a similar level.

Table 5. Comparison of Music Teachers' Perceived Self-Efficacy for Technology Integration based on School Level

	School Level	N	Mean	Std. Deviation	t	p
Self-Efficacy for Teaching	High School	101	3.53	.72	1.62	0.11
Computer Technologies	Secondary School	115	3.37	.69	1.62	0.11
Self-Efficacy for Using	High School	101	3.31	.53	0.12	0.90
Computer Technologies	Secondary School	115	3.30	.56	0.12	0.90
Self-Efficacy for Technology	High School	101	3.42	.42	1.32	0.19
Integration	Secondary School	115	3.34	.49	1.33	0.18

Findings Related to the fifth Sub-Question

The fifth sub-question of the study was “Does music teachers’ perceived self-efficacy for technology integration differ based on age?” To answer this question, the data obtained from the scale were analysed with the One-way Analysis of Variance. Table 6 shows music teachers’ mean scores in perceived self-efficacy for technology integration scale based on age. According to One-Way Analysis of Variance, it is seen that there was a significant difference depending on age in the mean scores in perceived self-efficacy for technology integration ($p < 0.05$). According to the Post Hoc Analysis, it was found that music teachers under the age of 40 had higher perceived self-efficacy for technology integration than their colleagues over the age of 40.

Table 6. Music Teachers' Perceived Self-Efficacy for Technology Integration based on Age

	Age	N	Mean	Std. Deviation	F	p
Self-Efficacy for Teaching Computer Technologies	20-29	64	3.70	0.55	6.10	.000
	30-39	42	3.53	0.72		
	40-49	70	3.20	0.80		
	50 and over	40	3.38	0.61		
Self-Efficacy for Using Computer Technologies	20-29	64	3.61	0.58	17.49	.000
	30-39	42	3.39	0.56		
	40-49	70	3.18	0.45		
	50 and over	40	2.93	0.30		
Self-Efficacy for Technology Integration	20-29	64	3.65	0.45	18.47	.000
	30-39	42	3.46	0.45		
	40-49	70	3.19	0.38		
	50 and over	40	3.16	0.34		

Discussion

Today, in almost all public and private educational institutions, lessons are carried out with technological support. However, the scope, functions and dimensions of these technologies differ from one institution to the

next. The use of technology in teaching lessons requires music teachers to use new pedagogical approaches. Thus, the ability of music teachers to integrate technology is important. Research findings showed that the participants' perceived self-efficacy for technology integration were moderate. These findings were similar to the findings of the studies conducted by Dođru (2020), Kaleli (2021), Kara (2021), and Kibici (2022b). According to Angeli and Valanides (2005), there are problems in teachers' ability to integrate technology into their fields and learning-teaching process. However, if the teacher teaches the lessons with technological support and adopts pedagogical approaches suitable for this technology, the efficiency of the lesson will increase significantly.

Another finding of the study is related to music teachers' perceived self-efficacy for technology integration based on gender. The analyses revealed that a significant difference was found in terms of "Self-Efficacy for Using Computer Technologies" based on gender. In the study, it was found that male music teachers' perceived self-efficacy for using computer technologies was significantly higher. These findings were similar to the findings of Dođru (2020), Gudek (2019), Koyuncuođlu (2021), Margrett and Marsiske (2002) and Sieverding and Koch (2009). According to Cassidy and Eachus (2002), the difference in self-efficacy may be due to the fact that male students use the computer for a longer period of time and for different purposes than female students. Another finding of the study was related to music teachers' perceived self-efficacy for technology integration based on age. According to the analyses, a significant difference was found in all dimensions of perceived self-efficacy for technology integration based on age. The study found that technology self-efficacy perceptions of music teachers under the age of 40 were significantly higher than their older colleagues. This finding was similar to the findings of the studies conducted by Çetin and Beledemir (2014), Dođru (2020), and Kibici (2022). Similarly, the study conducted by Çetin and Belemir (2014) on primary school teachers, it was found that both seniority and age, as variables, were effective on computer perceptions of self-efficacy. Younger teachers had higher levels of perceived self-efficacy. Various reports have suggested that technology integration skills are lower in older teachers than other age groups, and younger teachers are more proficient than other age groups (Anabousy & Tabach, 2018; Area-Moreira et al, 2016; Gómez et al, 2010; Hsu & Chen, 2018; Koh et al., 2013; Peled & Perzon, 2021).

Another finding of the study relates to music teachers' perceived self-efficacy of technology integration based on school type and level. A significant difference was found in all dimensions of technology integration self-efficacy based on school type, but no significant difference was found by school level. It was found that music teachers working in private schools had significantly high level of perceived self-efficacy for technology integration. There are studies reporting that the teachers working in public schools have a low level of proficiency in using technology in education. It is similar to the findings of the study conducted among subject and art teachers by Dođru (2020), Kibici (2021) and Kayaduman at al. (2011). Kayaduman at al. (2011) found that teachers working in public schools had a lack of proficiency in information and communication technologies. According to Liang (2021), this situation negatively affects teachers' competencies in technology integration. Siefert et al. (2019) reported that teachers rarely use multimodal technology to provide students with productive and meaningful learning experiences in public schools. It is reported that especially teachers in public schools have an understanding that technology integration will increase their workload (Hedayati &

Marandi, 2014; Raman & Yamat, 2014) and cause technical problems (Bueno Alastuey, 2011; Comas-Quinn, 2011). For this reason, it is thought that such perceptions have an important place in the low technology self-efficacy of music teachers working in public schools.

Conclusion

In this study, in which music teachers' perceived self-efficacy for technology integration was investigated, it was found that the participants had a moderate level of perceived self-efficacy. Comparative analyses indicated that music teachers' self-efficacy for technology integration differed according to gender, age and school type variables. Within the scope of this study, when the study groups were investigated, it was seen that female teacher had the same level of perceived self-efficacy for technology integration as their male colleagues. In addition, perceived self-efficacy of music teachers over the age of forty and working in public schools were low for technology integration. Some suggestions can be made based on the results obtained from this research: Music teachers can be informed about the latest technologies by organizing in-service training programs. The factors underlying the music teachers' inadequacy in technology can be investigated with qualitative research methods. It is thought that with the widespread use of online environments for teaching purposes, teachers' competencies of technology integration may change. Thus, the fact that music teachers use online environments more will both improve their technology competencies and provide a more interesting and fun music learning environment for students.

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