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Examining music teachers' self-confidence levels in using information and communication technologies for education based on measurable variables

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Rapid developments and innovations in technology have impact on individuals. The use of technology for one's daily life has become a necessity; therefore, the development and popularization of Information and Communication Technologies (ICTs) is use as a tool for solving educational problems. Because educational technologies play a major role both in learning and teaching, it is undoubtedly required that music teachers have the knowledge and skills of using these technologies. Teachers should use technologies that are appropriate to the course objective, and they should be used to make students understand the course material better, and form permanent knowledge. For that reason, this study aims to determine music teachers' self-confidence levels in the use of information and communication technologies in education based on variables analyzed with a descriptive screening model. For data collection, a 5-point Likert-type scale was used. In conclusion, this study did not find a significant difference in terms of gender and age variables. However, professional seniority, having a personal computer or not, and having access to internet at home or not, all had a significant effect on self-confidence.

Key words: Music teacher, information and communication technology, self-confidence.

INTRODUCTION

In the 21th century, people live in an information age characterized by rapid changes and developments in information and communication technologies (ICTs). This necessitates that societies need to adapt rapidly to those changes and developments that are leading to a knowledge explosion.

The information produced generates new technologies that enable information to be spread more rapidly and easily. ICT includes all kinds of visual, auditory, printed, and written instruments that allow access to and produce information (Çavaş et al., 2004). In this respect, ICT is of great importance today (Zyad, 2016).

Innovations and rapid developments in information and communication technology affect the educational field, as they do all other fields. Therefore, utilizing ICT in an educational field or in many other fields during the

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learning-teaching process has demanded significant innovation, and music and music education is among those fields. Recent developments in music technology have offered new opportunities for teachers and students. For instance, using software programs in music lessons provides new methods and makes important contributions to students in individual and group activities through helping them improve their skills in composing and creativity (Robyler and Edwards, 2000).

The dissemination and application of educational innovations largely depend on teachers' adoption of these innovations. Therefore, ICT not only helps students a more rapid and easy access to information throughout their education, but also provides them with richer learning environments (Sirkemaa, 2001).

In this respect, ICT's contributions to the education is an undeniable fact (Uşun, 2000), and the relationship between education and technology is in a continuous state of change and development (Watson, 2001). Therefore, it can be possible for individuals to make information transfer, to access information and to evaluate information in a more rapid and easy way (Mooij, 2007). Bulman and Fairlie (2015) placed an emphasis on ICT for the improvement of the education system.

Today, individuals' need for ICT have gained more importance than ever. One of the duties of education is to raise individuals who can use technology productively (Christanse, 2002). In this respect, teachers have enhanced duties: they should have relevant knowledge, skills, and qualifications for the use of ICT (Christanse, 2002).

In addition, it has been stated that having qualifications for use of ICT is not always considered only as an advantage, but that it is regarded as a significant loss if teachers do not have these qualifications (Roussos, 2007). Undoubtedly, to achieve efficient use of ICT in schools, teachers must first be educated in ICT (Aslan and Zhu, 2015). Because teachers have necessary technical competences in this issue and know how to use these technologies, it is important for teachers to see that students use ICT for educational purposes in a productive way. Erdoğdu and Erdoğdu (2015) reported that teachers' use of ICT in education enabled students to be more successful and made positive contributions to their learning.

Giving weight to the ICT investments is important for improving the quality of education. A study indicated that many countries worldwide have made investments for ICT to improve, develop, and update education that is provided to their younger generations. In addition, it has been emphasized that developed countries such as Canada, England, and the United States gave computer to students in a ratio of one for every 10 students (Hepp et al., 2004). Thus, many countries make an investment that shows they regard ICT an important tool for education. Another study showed that, especially in primary and secondary school levels, state-sponsored configurations have been made since 1980s for the effective use of ICT in educational institutions (Visscher et al., 2003).

Checchi et al. (2015) suggested that ICT courses should be included in the curriculum, and ICT should be integrated into the education programs. Even though investments in ICT have been made in Turkey, teachers cannot integrate ICT into educational environments, cannot use the technology for the purpose of increasing learning, and do not feel ready to make progress in these directions (Brush et al., 2003; Prestridge, 2007).

Studies have also emphasized that inadequate pre-service education received by teachers is the primary reason hampering teachers' ICT use. These results are important because they are clear signs that teachers cannot use technology effectively in educational environments (Acuner and İpek, 2011). A study emphasized the importance of training teachers in other for them to have the ability to use ICT (Gill et al., 2014).

In addition to the presence of information and communication technologies in schools, teachers' self-confidence in ICT, as well as their knowledge, skills, and competencies, is important for integrating ICT into teaching environments (Papanastasiou and Angeli, 2008). Ertner's 2005 study emphasized the importance of internal factors such as attitude and self-confidence, as well as external factors such as the school climate and support in the integration of ICT into educational environments (Ertmer, 2005).

Analysis of studies in the literature has revealed that the importance of appropriate knowledge, skills, and competence for the effective use of ICT is under discussion (Ertmer, 2005). The recent study of Kılıç (2015) indicated that teachers use technology in their classes more as their self-confidence regarding the use of ICT increases, and that this understanding helps them to improve their self-confidence. Roussos (2007) found that when teachers do not have knowledge, skill, and experience regarding ICT use, their self-confidence levels and, at the same time, their ICT use rates decrease.

Studies conducted on ICT have emphasized that both gender (Keser et al., 2015; Sezer, 2015), and experience (Kazu and Erten, 2014) are important factors for the development of self-confidence. Shashaani and Khalili (2001) reported that the rate of ICT use increases as self-confidence levels increase. Therefore, those persons having higher self-confidence regarding the use of ICT make more effort to learn, whereas those with low self-confidence have more resistance to ICT use (Scherer, 2015).

It has been seen that determining teachers' self-confidence levels regarding the use of ICT during the educational process is an important matter in terms of providing the effective use of the ICT in the learning-

teaching process. Moreover, the present study is important because it acts as a pioneer for further studies about similar issues. Although there are limited studies determining teachers' self-confidence levels regarding ICT use, no studies have been conducted that actually evaluate music teachers' self-confidence levels regarding ICT use.

Thus, determining the variables that affect the self-confidence level will contribute to reveal the relevant measures that can be considered in the integration process for these variables. The present study will show that music teachers' higher self-confidence levels regarding the use of ICT will be beneficial for the field in terms of that teachers' ability to improve their skills, follow current issues, and, in their professional life, improve their students' abilities. In this regard, the present study aims to examine music teachers' self-confidence levels regarding using information and communication technologies in education in terms of clearly stated variables. This study, with this basic aim, sought answers the following research questions:

Do music teachers' self-confidence levels regarding using ICT

1. Differ by gender?
2. Differ by possession of a personal computer?
3. Differ by having had internet access at home?
4. Differ by age?
5. Differ by a teacher's professional seniority?
6. Differ by computer usage hours?

METHODOLOGY

Type of the study

In accordance with the purpose of this study, descriptive scan model was used. Most of the studies conducted within the scope of quantitative research approaches about educational sciences generally used descriptive scanning model (Cohen et al., 2013).

Participants

The study group comprised 278 (146 females and 132 males) music teachers working in different regions of Turkey. The participants were specified using an easily accessible case sampling method, one of the non-random sampling methods. This easily accessible case sampling method provides speed and practicality for researchers because in using this method, researchers prefer a case that is nearby geographically and easily accessible (Yıldırım and Şimşek, 2008). The teacher-participant sample included 97 teachers (35%) from the Aegean region, 89 (32%) from the Marmara region, and 92 teachers (33%) from other regions of Turkey.

Instruments

This study used a personal information form, and a scale developed to determine self-confidence about the use of information and communication technologies in education.

Personal information form

The personal information form comprised two parts. In the first part, there were questions about personal characteristics such as gender, age and professional seniority. The second part was about computer experience, and consisted of questions regarding internet access at home, whether the participant had a personal computer, and their hours of computer usage.

The self-confidence scale for the use of information and communication technologies in education is a 5-point Likert-type scale developed by Papanastasiou and Angeli (2008), and adapted for Turkish use by Tezci (2010) to determine self-confidence regarding the use of information and communication technologies. This scale was reviewed by three language experts working in the English language teaching field. Tezci (2010) adjusted this scale by adding three new items. The final version of the scale comprised 11 items. Participants' answers indicated their agreement levels: 1=Strongly disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4= Agree, 5=Strongly Agree.

For validity and reliability analysis, Tezci (2010) administered the scale to 272 primary school teachers (class and branch teachers) working in the Balıkesir Province. After Tezci (2010) administered the scale, Kaiser-Meyer-Olkin (KMO) and Bartlett's test values were examined for the suitability of data for analysis. This examination found the KMO value and the Bartlett test value to be significant at the level of 0.928 and 0.000, respectively.

This study determined that results were sufficient for performing a principal components analysis of the results. That analysis revealed that all items of the scale gathered under one factor and found that the total explained variance of eleven items was 62.249%. For correlations between items, the lowest value was between items 11 and 10 (0.259), and the highest value was between items 7 and 8 (0.785). The Cronbach's Alpha reliability coefficient of this scale was 0.921. Therefore, both opinions of the experts and data obtained from the pre-application of the study confirmed that the scale is appropriate for collecting data in terms of validity and reliability. In this sense, this study found the reliability of the scale to be 0.88.

Data analysis

In comparisons between two variables, this study used the unrelated (independent) samples t-test, when variables were homogeneous, and the Mann-Whitney U test, when variables were not homogeneous, to determine whether there were self-confidence differences between music teachers' opinions in terms of gender, personal computer, and internet access at home. For unrelated samples, in comparisons over more than two variables such as age, professional seniority, hours of computer usage, this study used the one-way variance analysis (ANOVA) when variables were homogenous, and the Kruskal-Wallis H test was used for variables that were not homogeneous. Cohen's d coefficient was calculated to determine the effect size of the difference where differences were found.

RESULTS AND FINDINGS

The independent groups t-test analysis was performed because variables in this study were homogeneous in

Table 1. t-test analysis results.

Independent variable	Group	N	$\overline{X}$	SD	t	sd	p	Cohen's d
Gender	Female	146	2.68	0.46	-1.469	0.276	0.469	-
	Male	132	2.73	0.42				
Personal computer	Yes	210	2.78	0.43	7.864	0.276	0.00*	0.724
	No	68	2.32	0.52				
Internet access at home	Yes	194	2.78	0.41	6.502	0.276	0.00*	0.611
	No	84	2.41	0.43				

terms of music teachers' gender, having a personal computer, and having had internet access at home. This study used Cohen's d in the analysis to calculate the effect size of difference. Analysis results obtained regarding the specified variables are shown in Table 1.

Table 1 shows that there was no statistically significant difference between music teachers' self-confidence levels regarding the use of ICT by gender (t =-1.469, *p>.05*). In other words, self-confidence levels of female teachers ($\overline{X}$ =2.68) and male teachers ($\overline{X}$ =2.73) were close. Analysis of music teachers' self-confidence levels regarding the use of ICT according to the status of having a personal computer did not find a statistically significant difference (t=7.864, *p<.05*). Gil-Flores et al. (2017) found no significant difference between teachers' levels of self-confidence in the use of ICT and their genders. This finding supports the results of the present study.

Teachers having a personal computer ($\overline{X}$ =2.78) had more self-confidence than those who did not have a personal computer ($\overline{X}$ =2.32). When music teachers' self-confidence levels regarding the use of ICT were examined according to the status of having Internet access at home, it was found no statistically significant difference (t=6.502, *p<.05*). A previous study supports this finding (Huang et al., 2016).

This study found that self-confidence levels of participants having Internet access at home ($\overline{X}$ =2.78) were greater than those who did not have internet access ($\overline{X}$ =2.41). In addition, this study showed that the effect size between means in terms of having a personal computer and having Internet access at home was moderate and higher. These results revealed the importance of considering the effect of having a personal computer and Internet access at home on self-confidence. Erdoğdu and Erdoğdu (2015) stated that those who had internet access in their homes had higher level of self-confidence. This finding is parallel to the results of the present study.

This study also compared music teachers' self-confidence levels in terms of age, professional seniority, and hours of computer use. To determine whether there was a statistically significant difference between variables, this study used the one-way variance analysis (ANOVA) for data analysis, when variables were homogeneous. Moreover, when a significant difference was found through data analysis, to determine between which groups this difference existed, this study performed a Tukey analysis and examined the effect size. Analysis results obtained regarding the specified variables are shown in Table 2.

As it is seen in Table 2, this study revealed that music teachers' professional seniority (F(3,274)=14.221, *p<.05*) and their hours of computer use (F(3,274)=162.164, *p<.05*) had a statistically significant effect on self-confidence. These findings showed that the effect size of the difference between means in terms of teachers' professional seniority was at medium level, whereas the effect size of the difference between means, in terms of the hours of computer use variable, was found to be very high.

Akgül et al. (2015) emphasized that teachers' levels of self-confidence in the use of ICT were higher than those of teachers who had lower levels of professional seniority. Another study showed that individuals' increased hours of computer use resulted in their positive attitudes towards computers and allowed them to more self-confident (Mumcu and Dönmez, 2014).

In addition, this study showed that music teachers' age (F(3,274)=.548, *p>.05*) had no statistically significant effect on their self-confidence levels.

DISCUSSION AND CONCLUSION

The present study shows that music teachers' self-confidence levels did not have a statistically significant difference in terms of the gender variable, that is, that gender has no effect on self-confidence. Because the rate of teachers' use of ICT has gradually increased, it is suggested that any difference related to gender has

Table 2. One-way variance analysis results.

Variable	Groups	N	$\overline{X}$	SD	Mean of squares (S)	F	p	Cohen's d	Tukey
Age	a) 20-29	126	2.78	0.51	0.124	0.548	0.612**	-	-
	b) 30-39	82	2.66	0.58	0.246	-	-	-	-
	a) 40-49	24	2.58	0.38	-	-	-	-	-
	d) 50 years or above	46	2.79	0.52	-	-	-	-	-
Professional seniority	a) 1-5 years	100	2.82	0.48	3.264	14.221	0.00*	0.264	a>b, c, d
	b) 6-10 years	61	2.68	0.46	0.211	-	-	-	-
	b) 11-19 years	61	2.62	0.44	-	-	-	-	-
	d) 20 years or above	56	2.58	0.42	-	-	-	-	-
Hours of computer usage	a) 1-2 h	74	2.54	0.37	22.886	162.124	0.00*	.848	d>c>b, a
	b) 3-6 h	111	2.57	0.35	0.136	-	-	-	-
	b) 7-10 h	50	2.86	0.32	-	-	-	-	-
	d) 11 h or more	43	3.81	0.35	-	-	-	-	-
p<.05*;p>.05**	-	-	-	-	-	-	-	-	-

gradually decreased thereby.

Thus, this result can be explained both that female and male teachers are directed to computer-related jobs and that they are supported for studies regarding tools about information and communication technologies. Moreover, it is suggested that this finding may arise from the fact that both females and males have been interested in using information and communication technologies from their childhood years.

Roussos (2007) stated in his study that gender is not a significant factor in determining self-confidence levels. In the literature, there are similar findings (Karadeniz and Vatanartıran, 2015; Şad and Nalçacı, 2015). However, there are studies that have shown a significant relationship between gender and self-confidence scores (Akgül et al., 2015; Gönen and Kocakaya, 2015).

Music teachers' self-confidence levels differed statistically significantly concerning having a personal computer: having a personal computer is important for further development of self-confidence levels. Therefore, this result makes it necessary to consider the effect of personal computers on self-confidence. Moreover, it also shows that the effect size of the difference between means, the importance of this difference, and the necessity of taking this difference into account. In the final analysis, the present study revealed that regarding teachers' self-confidence level, among those teachers who had a personal computer, the level of ICT use was higher than among those who did not have a personal computer. This finding is largely in agreement with the results of other studies (Tezci, 2010; Menzi et al., 2012; Gürbüztürk et al., 2015; Şad and Nalçacı, 2015).

In this study, music teachers' self-confidence levels regarding using ICT was statistically significantly different depending on the status of having had Internet access at home; other studies support this result (Menzi et al., 2012; Mumcu and Dönmez, 2014). Furthermore, the present study showed that there is no statistically significant difference between music teachers' self-confidence and their age. A similar study did not find significant differences between teacher age and self-confidence levels (Roussos, 2007). These previous findings support the findings of the present study.

Another finding of the present study was that music teachers' self-confidence statistically significantly differed in terms of the professional seniority variable: music teachers with lower

professional seniority years had higher levels of self-confidence. It is likely that teacher who had recently started their careers followed new technologies more effectively with their knowledge and experiences. That is in agreement with studies conducted (Tezci, 2010; Akgül et al., 2015). Akgül et al. (2015) stated that young people had more chance to have an interaction with technology compared to the previous generation.

Chen (2008) reiterated that self-confidence levels of teachers, who had recently started their careers, regarding use of ICT was higher; these results are in line with findings of the present study. Rowand (2000) emphasized that teachers with lower professional seniority years use the Internet more often and mostly to reach information or to share information with their colleagues. Therefore, these results provide evidence that newly hired teachers had access to computer training during their undergraduate studies; therefore, they have a better cognitive background related to computer use, they have had more opportunities to use a computer; and they are more interested in computers.

Based on study findings, music teachers' self-confidence differed statistically significantly in terms of the hours of computer use variable. Therefore, if teachers have a personal computer, it is expected that they access desired information whenever they want or need to, depending on their computer use frequency and hours.

Wilfong (2006) reported that self-confidence level increases as the frequency of ICT use increases. A study in the literature showed that the effect size of the difference between means was quite high, indicating that emphasizing practice rather than theory is the important way to increase the information and communication technologies use by teachers. Çevik Kılıç (2015) stated that the qualifications for use of ICT should be reviewed and the deficiencies in this issue should be explored. Mumcu and Dönmez (2014) emphasized that the more frequently individuals used computer, the more proficient they would feel themselves.

The present study shows that music teachers' self-confidence regarding the use of ICT is an issue that should be emphasized. Therefore, improving teachers' self-confidence has equal importance as making investments in technology. In this sense, it can be assumed that music teachers will make more of an effort to create an effective learning environment thanks to their higher levels of self-confidence regarding the use of ICT. Özüt and Tuncer (2012) also discussed the fact that teachers can be more efficient in most fields related to their jobs by proper and appropriate use of ICT, and especially in educational-instructional processes.

Thus, with rapid technological changes and developments experienced in today's world, it is essential for music teachers to combine and integrate their knowledge and experiences with technological learning environments. In other words, self-confidence should be taken into consideration during the period where ICT use is being integrated with traditional teaching practices throughout the learning-teaching process. In this respect, it is necessary and important to provide opportunities for teachers to gain an increased knowledge level regarding effective ICT use in classrooms during learning-teaching processes. In the light of these findings, the following recommendations are offered:

1. Seminars and in-service training activities should be organized for music teachers to improve their self-confidence regarding the use of ICT.
2. With semi-structured interviews, music teachers' self-confidence levels regarding using ICT should be examined.
3. Further studies should be conducted to discuss other variables that also affect the use of ICT.
4. To increase the use of ICT, it may be appropriate to provide time for more practice rather than introducing more theory.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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