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Relationship between pre-service music teachers' personality and motivation for computer-assisted instruction

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The main purpose of this study was to examine the relationship between pre-service music teachers' personalities and their motivation for computer-assisted instruction (CAI). The 'Big Five' Model of Personality served as the framework. Participants were 83 pre-service music teachers in Turkey. Correlation analysis revealed that three dimensions of personality (Extroversion, Openness and Conscientiousness) were positively related to participants' motivation for CAI. Stepwise regression analysis revealed that only Extroversion and Openness dimensions made a significant contribution to the prediction of motivation. These results suggest that pre-service music teachers who see themselves as extroverted, sociable, organised, careful and disciplined tend to be more motivated to use CAI than those who see themselves as introverted, reserved, disorganised, careless and impulsive.

Keywords: personality; music education; computer-assisted instruction; Big Five Model; motivation

Introduction

Extensive and effctive use of Information and Communication Technologies (ICT) in education is among the fundamental educational objectives of all European countries including Turkey. A report prepared by the European Schoolnet (Balanskat, Blamire, and Kefala 2006) examined the effect of ICT on schools in Europe. The report highlights four main points about the issue: (1) students, teachers and parents believe that ICT has a positive influence on learning; (2) most schools in most countries are in the early phase of ICT use; (3) there are certain barriers to ICT adoption; and (4) teachers' motivation is a critical factor in ICT adoption, but it is often neglected.

In a recent study carried out with 1429 teachers in 69 schools in 35 cities in Turkey, Goktas, Yildirim, and Yildirim (2008) found that 54% of in-service teachers rarely or never used the computer labs in their schools, while 35% had never integrated ICT into their classes. Goktas, Yildirim, and Yildirim (2009) conducted another study using the same participants and found that most of the teachers perceived themselves as incompetent in the use of ICT.

In Turkey, various efforts have been made to enhance teachers' competency in ICT use in education. Since motivation is a critical factor in the success of ICT

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adoption (Balanskat, Blamire, and Kefala 2006), a number of researchers measured teachers' motivation and their results demonstrated that Turkish teachers in general have a positive view towards ICT in Education (Celik and Bindak 2005; Deniz 2005; Erkan 2004). However, such studies were mostly conducted with elementary school teachers. Studies on secondary school teachers including music teachers have been scarce.

Information and Communication Technologies (ICT) in music and music education

Technology occupies an important place in music education. Researchers in this field have focused their research on two aspects: (1) developing various kinds of software for computer-assisted instruction (CAI); and (2) measuring the effectiveness of CAI in music education. For example, Chan et al. (2006) developed software titled 'Teach Me Piano Deluxe' and investigated its effectiveness in developing students' various music skills. They found that the students improved their music reading of (staff) notation and rhythmic skills and suggested that 'such potential improvement in practical skills may, in turn, enable pupils to approach music-based activities such as: composing, performing or listening in the classrooms, with greater confidence, a deeper level of understanding, and appreciation' (391). CAI was also found to contribute to rhythmic performance (Smith 2009), the quality of learning (Ho 2004), practical skills (Chan et al. 2006) and instrument playing skills (Orman 1998). Therefore, researchers have mainly turned their attention towards students, underlining that personal differences among students (e.g. learning style) should be taken into account when designing software programmes; and they have investigated how these influenced the development of students' music skills.

Teachers play a key role in CAI's effectiveness (Kidd and Song 2005) as it is teachers who decide whether CAI will be used in the classroom. Thus, teachers including music teachers should have high motivation towards CAI in order that their students fully benefit from it. However, we failed to identify any study investigating whether teachers and pre-service teachers are ready and motivated to use CAI in their classroom.

Motivation

Motivation, by definition, is a 'force that energizes, sustains, and directs behaviour toward a goal' (Pintrich and Schunk 2002 as cited in Eggen and Kauchak 2004, 349). Motivation can be examined in two broad categories: extrinsic motivation and intrinsic motivation. Extrinsic motivation is 'the motivation to engage in an activity as a means to an end, whereas intrinsic motivation is the motivation to be involved in an activity for its own sake' (Pintrich and Schunk 2002 as cited in Eggen and Kauchak 2004, 391). For example, extrinsically motivated pre-service music teachers may study hard for a music test in order to receive a good grade, whereas intrinsically motivated pre-service teachers may study hard for a music test because he/she likes the course content.

Different psychological perspectives explain motivation in different ways. For example, while the behavioural perspectives stress rewards and punishments as main keys in increasing motivation, cognitive perspectives claim that people's thoughts guide their motivation. Goal setting is an important construct in many

cognitive-based motivation theories. Having a goal reflects one's determination to strive towards a particular outcome or perform a particular activity (Lent, Brown, and Hackett 1994) and gives a framework within which individuals interpret and react to events (Dweck and Leggett 1988). By setting goals, people 'help to organize and guide behaviour, to sustain it over long periods of time in the absence of external reinforcement and to increase the likelihood that the desired outcomes will be attained' (Lent, Brown, and Hackett 1994, 84). Different types of goals are identified in the literature, one of which is choice goals. Choice goals deal with people's plans, aspirations and determinations towards specific activities.

Goals are influenced by several cognitive factors including self-efficacy, outcome expectations and interests (Lent, Brown, and Hackett 1994; Sahin 2008). Using a path analysis technique, Sahin (2008) examined the influence of cognitive variables on Turkish faculty members' intentions (goals) regarding the use of educational technology in the classroom and found that cognitive variables (self-efficacy, outcome expectations and vocational interests) are interrelated and each had an influence on intentions.

Besides cognitive variables, trait variables (like personality) play an important role in human motivation. For example, students with extrovert personalities tend to be more motivated to learn in classroom activities when they are asked to collaborate with the others. On the other hand, the introverts tend to be more motivated when they are asked to carry out the classroom activities independently (Santrock 2006).

Personality in music literature

Personality occupies a remarkable place in the literature on music. Most of the studies on personality deal with the personality of musicians. Using the Vocational Preference Inventory, Teachout (2001) examined the relationship between personality and the teaching effectiveness of music student teachers on the basis of Holland's Theory and found that music student teachers are first and foremost artistic, and to a substantial but significantly lesser degree they are social and investigative; and that none of the personality dimensions significantly contributed to teaching effectiveness. Other researchers used different theoretical approaches and assessment tools, such as Myers-Briggs Type Indicator (MBTI; Kramer and Conoley 1992) and the Sixteen Personality Factor Questionnaire (16 P-F; Kemp 1982).

Kemp (1996) enhanced our understanding of musicians' personalities, and much of his work can be reviewed in his book, 'The Musical Temperament: Psychology and Personality of Musicians'. In his studies, Kemp used Raymond Cattell's Sixteen Factor Personality Questionnaire to assess musicians' personalities. He noted that 'Certainly, I wish to take the view here that the musician's development is a product of the kind of person that he or she is' (15). This statement suggests that personality might play an important role in a musician's development. As technology now has an important role in the development of musicians and in training music teachers, it would be useful to determine the motivation of pre-service music teachers towards technology and ascertain whether this motivation is influenced by personality.

Based on the Big Five Model of Personality, this study aims to investigate the overall motivation levels of pre-service music teachers' motivation for CAI and its relation to personality. This model was chosen as a theoretical framework for three reasons: first, the model has gained wide acceptance in the last two decades;

secondly, several studies showed its validity (e.g. Costa 2000); and thirdly, it has received little attention in music literature. We believe that selection of this model will contribute to the literature on music since it offers a different perspective regarding the effect of personality on music-related behaviour.

Theoretical framework: Big Five Model of Personality

By its definition, personality 'is a coherent and settled form of relationship that an individual established with his/her internal and external environment and distinguishes him/her from other individuals' (Cuceloglu 2008, 404). In the definition, the concept of coherency means 'whether the individual's behaviour changes in similar situations in time' and the term 'settled' means that personality is a system consisting of numerous units, each of which develops interrelated patterns.

Norman (1963) conducted research using the factor analysis in statistics and found that human personality can be analysed under five factors: Extroversion, Neuroticism, Openness, Conscientiousness and Agreeableness. These factors eventually became known as the 'Big Five' (Goldberg 1981). It is important to note that Big Five structure 'does not imply that personality differences can be reduced to only five traits. Rather, these five dimensions represent personality at the broadest level of abstraction, and each dimension summarizes a large number of distinct, more specific personality characteristics' (John and Srvastave 1999, 109).

Several research studies revealed that personality was related to a variety of vocational and academic behaviours including job performance (Barrick and Mount 1991), job satisfaction (Judge, Heler, and Mount 2002) and academic performance (Paunonen and Ashton 2001; Ridgell and Lounsbury 2004). In a correlational study, Busato et al. (2000) found that achievement motivation was significantly related to Conscientiousness ($r = 0.57$), Extroversion ($r = 0.22$), Agreeableness ($r = 0.13$) and Openness ($r = 0.14$).

Research questions

Based on the Big Five Model of Personality, this study aims to investigate the overall levels of pre-service teachers' motivation towards CAI and their relation to personality. To help meet this aim, two research questions were addressed.

(1) What are the overall levels of pre-service music teachers' motivation (as assessed by their choice goals) towards CAI?
(2) Is there a significant relationship between pre-service teachers' personality and their motivation towards CAI?

Method

Participants

The participants included 83 pre-service music teachers (52 female and 31 male) enrolled in the department of music education in a university in Western Turkey. Thirty-four per cent of the participants were first-year undergraduates ($n = 28$), 29% were in their second year ($n = 25$), 23% third year ($n = 18$) and 14% fourth year

($n = 12$). The participants were asked to complete a survey during a regular class session in the final week of the semester. Participation was voluntary. The researcher explained the purpose of the study to the participants and those who were willing to participate signed a consent form and completed the survey.

Instruments

The instrument (Music Education Personality Profile Test) used in this study consisted of three sections: (1) Demographic Information; (2) Motivation for CAI Scale; and (3) Adjective-based Personality Test.

Based on the Intrapersonal Technology Integration Scale (Niederhauer and Perkmen 2008), the Motivation for CAI Scale is designed to assess participants' motivation for CAI in the classroom. It consists of three questions: (1) 'I plan to use CAI in my future classroom activities'; (2) 'I plan to use a variety of educational software to help my students understand the subject matter better'; and (3) 'I plan to increase my knowledge about CAI to become a better teacher'. Item ratings were added up and divided by three (the number of questions in the test) to calculate the total motivation score for CAI. Scores on each item and overall scale ranged from 1 to 5 with higher scores indicating higher motivation.

The Adjective-based Personality Test (Bacanli, Ilhan, and Aslan 2007) was used in this study to examine the participants' personality in five dimensions. The dimensions are Neuroticism (seven items), Extroversion (nine items), Openness (eight items), Agreeableness (nine items) and Conscientiousness (seven items). This test consists of 40 pairs of opposite adjectives (e.g. patient–impatient and quiet–talkative). The participants were asked to indicate for each dimension the extent to which they agree with the left or right half of the item responding on a seven-point scale ranging from 1 to 7. Table 1 provides an example of a pair of opposite adjectives for each dimension. For instance, the second item in Table 1 is intended to assess personality in the 'Extroversion' dimension. If an individual believes that 'talkative' is a very appropriate adjective that describes himself or herself, he/she received the maximum score (7 points) for this item.

Bacanli, Ilhan, and Aslan (2007) conducted a factor analysis to demonstrate the construct validity of the test. Using a sample of 285 students, they found that each item loaded on their respective factor and the five-factor solution accounted for 52% of the total variance of the test. In addition to construct validity, they also performed an internal consistency analysis to examine the internal consistency of the scale. They found Cronbach alpha coefficients of 0.73 for Neuroticism, 0.89 for Extroversion, 0.80 for Openness, 0.87 for Agreeableness and 0.80 for Conscientiousness. These coefficients showed high internal consistency for each dimension in the test. We used Bacanli's personality test in our study as he is a leading scholar of guidance and psychological counselling in Turkey and the scale he developed has been proved in terms of validity and reliability.

Data analysis

Descriptive statistics were calculated to address the first research question in the study: *What are the overall motivation levels of pre-service teachers' motivation towards CAI?* A correlation analysis was conducted to address the second research

Table 1. Examples of the items in the Adjective-based Personality Test.

	Very appropriate (1)	Considerably appropriate (2)	Slightly appropriate (3)	Neither appropriate nor inappropriate (4)	Slightly appropriate (5)	Considerably appropriate (6)	Very appropriate (7)	
Patient	○	○	○	○	○	○	○	Impatient
Quiet	○	○	○	○	○	○	○	Talkative
Incurious	○	○	○	○	○	○	○	Curious
Selfish	○	○	○	○	○	○	○	Altruistic
Disorganised	○	○	○	○	○	○	○	Organised

question: *Is there a relationship between pre-service teachers' personality and their motivation towards* CAI?

Findings

Reliability analysis

Cronbach's alpha values showed a fairly high reliability for the Adjective-based Personality Test used in this study. Internal consistency of the entire test was 0.83 with sub-test consistencies of 0.75 for Neuroticism, 0.82 for Extroversion, 0.76 for Openness, 0.80 for Agreeableness, and 0.82 for Conscientiousness. Cronbach's alpha was 0.80 for the Motivation for CAI Scale.

Descriptive statistics

After establishing the internal consistency of the Adjective-based Personality Test and Motivation for CAI Scale, descriptive data were calculated for all variables in the study. Table 2 presents the mean, standard deviation, minimum and maximum scores for all survey items in the Motivation for CAI Scale. In general, pre-service teachers' motivation was high ($M = 4.53$, SD $= 0.60$).

Table 3 presents the mean, standard deviation, minimum and maximum scores for all dimensions in the 'Adjective-based Personality Test'. In general, the participants' scores in the Extroversion ($M = 5.47$, SD $= 1.01$), Openness ($M = 5.87$, SD $= 0.86$), Agreeableness (M $= 5.47$, SD $= 1.08$) and Conscientiousness ($M = 5.53$, SD $= 1.14$) dimensions were fairly high. In contrast, they scored low in the Neuroticism ($M = 3.77$, SD $= 1.27$) dimension of personality. A minimum score of 3 in the Extroversion and Agreeableness dimensions suggests that there seems to be no pre-service teacher in the study who sees himself/herself extremely introverted and disagreeable.

To address the second research question (*Is there a relationship between pre-service teachers' personality and their motivation towards CAI?*), Pearson correlations were calculated. The findings presented in Table 4 revealed that motivation was positively related to Extroversion ($r = 0.43$, $p < 0.01$), Openness ($r = 0.33$, $p < 0.01$)

Table 2. Descriptive statistics for motivation towards computer-assisted music instruction items.

			Range		
Item	*M*	SD	Minimum	Maximum	Possible
1. I plan to use computer-assisted instruction in my future classroom activities.	4.70	0.55	3	5	1–5
2. I plan to use a variety of educational software to help my students understand the subject matter better.	4.60	0.56	3	5	1–5
3. I plan to increase my knowledge about computer-assisted music instruction to become a better teacher.	4.29	0.94	1	5	1–5
Overall motivation	4.53	0.60	2	5	1–5

Table 3. Descriptive statistics for personality dimensions.

Dimension	*M*	SD	Range		Possible
			Minimum	Maximum	
1. Neuroticism	3.77	1.27	1	7	1–7
2. Extroversion	5.47	1.01	3	7	1–7
3. Openness	5.87	0.86	2.7	7	1–7
4. Agreeableness	5.47	1.08	3	7	1–7
5. Conscientiousness	5.53	1.14	1.8	7	1–7

and Conscientiousness ($r = 0.42$, $p < 0.01$). The other two personality dimensions were not correlated with motivation for CAI.

Stepwise regression analysis was conducted to examine the relative contribution of personality dimensions to predicting motivation. The findings revealed that only Extroversion and Conscientiousness dimensions made a significant contribution to the prediction of motivation. These two dimensions accounted for 22% of variation in motivation (see Table 5). This result indicates that both Extroversion and Conscientiousness offer useful and non-redundant information to predict motivation towards CAI.

Discussion

The main objective of the study was to examine pre-service music teachers' motivation for computer-assisted music education and its relation to personality. To begin with, the findings revealed that the vast majority of pre-service teachers in the current study were shown to have high motivation towards CAI, indicating that they plan to use CAI in their future classroom activities and to consider using different types of educational software to help their students learn the subject matters related to music. This result is in parallel to the results of the study by Goktas, Yildirim, and Yildirim (2008), which demonstrated that Turkish teachers have positive attitudes towards ICT, and of European Schoolnet's study (Balanskat, Blamire, and Kefala 2006), showing that the teachers in Europe believe in the benefits of ICT in education.

It is important to note that we measured students' motivation by examining their choice goals. Although goal is a strong indicator of human motivation for some theories (e.g. Goal Theory), other variables (e.g. self-efficacy, expectations and

Table 4. Correlations among variables.

Variable	1	2	3	4	5	6
1. Neuroticism	–	0.13	–0.08	–0.07	0.04	–0.09
2. Extroversion		–	0.54**	0.24*	0.59**	0.43**
3. Openness			–	0.50**	0.43**	0.33**
4. Agreeableness				–	0.35**	0.14
5. Conscientiousness					–	0.42**
6. Motivation						–

*$p < 0.05$; **$p < 0.01$.

Table 5. Stepwise regression predicting motivation.

Variable	R	R^2 change	F-change
Extroversion	0.43	0.18	17.94**
Conscientiousness	0.47	0.04	4.32*

*$p < 0.05$; **$p < 0.01$.

values) also play an important role in human motivation. Having a clear goal does not necessarily reflect one's self-efficacy (Bandura 1986). Thus, it would be useful for further research to consider other motivational factors (e.g. self-efficacy) concerning motivation for CAI.

The relationship of Extroversion, Openness and Conscientiousness to motivation was noteworthy. These dimensions of personality were significantly related to motivation. Moreover, two dimensions of personality (Extroversion and Conscientiousness) emerged as predictors of motivation towards CAI. This result reveals that pre-service music teachers who see themselves as extroverted, sociable, organised, careful and disciplined tend to be more motivated to use CAI in the classroom than those who see themselves as introverted, reserved, disorganised, careless and impulsive.

Technology is an ever-changing and evolving field. Individuals need to have an Openness to innovation to keep up with the changes and developments in this field. Accordingly, we found in our study a positive correlation between Openness to experience and motivation for CAI. Another important point is that the teaching profession involves a social environment. Thus, sociable and extrovert individuals tend to be more motivated towards the teaching profession. Therefore, whether or not technology is used in the classroom, we can expect that extrovert students will be more motivated for teaching. As a parallel finding of our study, we found a positive correlation between Extroversion and CAI. We also found a moderate correlation between Conscientiousness and CAI. This result is consistent with a study by Busato et al. (2000) which found a similar relationship between motivation and Conscientiousness.

Studies so far conducted on CAI in music education have investigated software development and the impact of the developed software upon various music skills of students; and studies on personality have been mainly concerned with what kind of personalities music teachers and musicians have. This study offers an opportunity for a simultaneous examination of personality and CAI.

One of the main goals of teacher education programmes is to help pre-service teachers to use ICT in their teaching and to develop motivation towards CAI pre-service teachers is important for the success of CAI and achieving the desired success in ICT Integration in Education. Therefore, it will be useful to identify the factors that affect pre-service teachers' motivation levels. As this study has demonstrated, pre-service teachers' personalities are correlated with their motivation towards CAI in music instruction. Certainly, motivation is influenced by a variety of factors, one of which is personality as a trait variable. Thus, as human personality does not easily change, future researchers may simultaneously examine trait variables like personality and state variables like self-efficacy and investigate which variables are better predictors of motivation for CAI.

Notes on contributors

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