



A multivariate comparison of computer anxiety levels between candidate and tenured school principals [☆]

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ABSTRACT

School administrators should be able to follow technological advancements and promote the role of leadership with regard to technology in their institutions. However, affective factors such as computer anxiety might hinder administrators' roles in this process. Therefore, this study investigated multivariate differences between candidate and tenured administrators on computer anxiety levels, after accounting for differences in age. The sample of the study included 216 candidates and 368 tenured school principals. The Computer Anxiety Scale and a set of demographic questions were used to collect the data. One-way multivariate analysis of covariance (MANCOVA) was performed on three dependent variables that are the three dimensions of computer anxiety (i.e., Affective Anxiety, Damaging Anxiety, and Learning Anxiety). Independent variable had two levels (i.e., candidate versus tenured administrators) and age was used as a covariate. Results showed multivariate significant differences. Candidate administrators reported higher levels of affective and learning anxiety compared to their tenured colleagues. We conclude that the sample of the study had accessibility and familiarity with computers; yet, showed different experiences. Finally, refinement is still needed in the area of computer anxiety and its relationships with other variables among educational administrators.

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1. Introduction

With the more extensive use in all levels of education (Durnell & Haag, 2002; Imhof, Vollmeyer, & Beierlein, 2007), issues related to computers are more focus of interest among researchers. It is predicted that the more people use computers in their daily lives, the higher number of people will face difficulties with computers (Beckers & Schmidt, 2001). In this context, the construct of computer anxiety has been studied since the beginnings of the 80s, mostly focusing on the non-cognitive factors such as attitudes, previous experiences with computers, trait anxiety, or personality traits (Brosnan, 1999; King, Bond, & Blanford, 2002; Namlu & Ceyhan, 2002).

Even though it has been studied for an extended period of time by now, there is still no consensus in the literature regarding the definition of computer anxiety (Beckers, Wicherts, & Schmidt,

2007). According to a commonly used definition, computer anxiety is the fear and apprehension felt by an individual when considering the utilization of computer technology or when actually using it (Maurer, 1983). A review of the literature showed that the most definitions of computer anxiety include a fear component (Chua, Chen, & Wong, 1999). Computerphobia (Rosen, Sears, & Weil, 1987), computer apprehension (Anderson, 1996), computer resistance (Bohlin & Hunt, 1995), and technophobia (Brosnan, 1999) are some of the other terms used interchangeably with computer anxiety.

Computer anxiety has been conceptualized as a multi-dimensional construct, including psychological, operational, and socio-logical components (e.g., Beckers & Schmidt, 2001; Beckers et al., 2007). Beckers and Schmidt (2001) suggest a six-factor computer anxiety model as computer literacy (basic computer skills); self-efficacy on learning how to use computers; physical awareness while using computers (e.g., breathing or sweating); attitudes toward computers; positive belief regarding the benefits of computers to society; and negative beliefs. According to Torzkadeh and Angulo (1992), there are three dimensions of computer anxiety: psychological, operational, and sociological (p. 278).

The psychological dimension includes psychological and emotional characteristics such as attitudes toward computers, self-perceptions, self-efficacy, personality types, or avoidance (Goldstein,

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Dudley, Erickson, & Richer, 2002). The operational dimension includes immediate factors that result from computers or computer courses such as computer classes, teachers, nature of computers, previous experiences, the frequency of use, the age of starting to use computers, and owning a personal computer (PC; Gordon, Killey, Shevlin, Mcilroy, & Tierney, 2003; Namlu & Ceyhan, 2002). The sociological dimension includes factors such as gender, age, ethnicity, academic major, nationality, or parents' socio-economic status (SES).

One's age is related to computer anxiety (Ayersman & Reed, 1996; Henderson, Deane, & Ward, 1995; Reed & Overbaugh, 1993; Weil & Rosen, 1995). Rosen and Weil (1995) found that older students experienced more computer anxiety than their younger counterparts, whereas Laguna and Babcock (1997) found the contrary. Henderson et al. (1995) call such findings as "a common over-generalization." Beckers and Schmidt (2003) conclude that it is difficult to pinpoint whether age or experience was the major cause of computer anxiety; nonetheless, it has been constantly found to be an important factor in age-related computer anxiety literature.

Owning a PC at home (ownership) and the frequency of computer use were found to be two of the operational components of computer anxiety (e.g., Brosnan, 1999; Keser, 2001; Rosen & Weil, 1995; Üstündağ, 2001). For example, Arıkan (2002) found that those individuals who owned a PC at home showed less anxiety related to computers. Similarly, Chua et al. (1999) and Chou (2003) found that computer usage was negatively related to computer anxiety. With a group of Turkish college students, Namlu and Ceyhan (2002) found that 19.8% of the students had a PC at home and those who had a PC showed significantly lower levels of computer anxiety compared to those who did not have one. In addition, they found that as the frequency of computer use increased, computer anxiety levels decreased. Finally, Baloğlu and Çevik (2008) concluded that argued that factors such as owning a PC at home or the frequency of computer use might confound computer anxiety.

The usage of computers in all levels of education has increased in recent years (Durndell & Haag, 2002; Selwyn, 2000) and it is expected, more than ever, that schools equip students with positive attitudes to follow the ever-changing technological advancements (Erdoğan, 2002). In this vein, one of the most important responsibilities lies on school administrators who should be able to follow the technological advancements and promote a leadership role with regard to technology in their institutions (Çelik, 2003). According to Karlı (2006), effective schools should incorporate a strong information technology infrastructure and administrators should create an atmosphere where computer literate individuals are educated. When administrators are not trained using up-to-date technology or do not have the knowledge and/or skills on constantly advancing technologies, they might, consciously or not, develop a negative attitude towards these technologies. Therefore, it is not surprising that researchers continue to find higher levels of anxiety among computer users (e.g., Baloğlu and Çevik, 2008). Thus, it becomes important to pinpoint the negative experiences such as computer anxiety that might hinder administrators' ability to use and/or promote technology.

Computer anxiety can be a barrier on the basic computer literacy or skills and school administrators with higher levels of computer anxiety might experience difficulties (Alkan, 1998; Teker, 1987). Howard (1986) investigated 111 administrators' attitudes toward computers and anxiety levels. The results showed that administrators' computer anxiety levels were lower and most administrators had positive attitudes towards computers; however, in the same time study, participants indicated negative experiences with software and hardware. Bozionelos (2001) investigated the prevalence of computer anxiety via an experimental study among 228 principals and assistant principals, 67 college graduates, and 220 students. Results showed that higher than 20% among principals and higher

than 40% among college students showed serious computer anxiety indications. Similarly, Üstündağ (2001) studied interests in computers, computer anxiety levels, and attitudes towards computers in education among 367 teachers and 39 administrators in Turkey. He found that ownership and computer competency levels significantly affected the administrators' computer anxiety levels.

It can be said that school administrators should be able to integrate and adapt to technology; however, factors such as anxiety might negatively affect this process. Therefore, the purpose of this study was to investigate the correlates of computer anxiety among a group of candidate and tenured Turkish school administrators. More specifically, two questions were addressed in the study: "What are the levels of computer anxiety among candidate and tenured school administrators in Turkey?" and "Is there any statistically significant difference on the levels of computer anxiety between candidate and tenured school principals, after adjusting for the effects of age?"

2. Method

2.1. Sample

Two independent samples were used in the study: candidate and tenured school principals. Graduate students from educational administration departments across the country are classified as "candidate school principals" because they pursue towards a degree in educational administration with an intention to be employed as school administrators in future. On the other hand, school administrators who are already employed in schools and fulfilled the tenure requirements for the job are classified as "tenured school principals."

The sample of candidates was selected from the graduate students of educational administration department throughout Turkey. Tenured school administrators were selected from among those principals who were employed in schools associated with the Ministry of National Education (MNE) in the mid-northern part of the country. There were a total of 850 candidate principals and 675 tenured principals in the population. From this population, 216 candidates and 368 tenured school principals voluntarily responded to the study.

In terms of gender, 110 (50.9%) candidates were men and 106 (49.1%) were women. Candidates' ages ranged from 21 to 64 ($M = 28.82$; $SD = 5.40$). More than half of the candidates were single ($n = 124$, 57.30%). Most candidates were doing their practicum at the time of the administration ($n = 206$, 95.4%). Among tenured school administrators, most were 353 men (95.9%) and only 15 were women (4.1%). Tenured administrators' ages ranged from 24 to 62 ($M = 42.86$; $SD = 8.07$). Most administrators were married ($n = 354$, 96.5%). Among the tenured administrators, there were 130 principals (35.3%) and 238 assistant principals (64.7%). Demographic information on candidate and tenured administrators was summarized in Table 1.

2.2. Instruments

The Computer Anxiety Scale (CAS; Ceyhan & Gürçan-Namlu, 2000) and a personal information sheet were used to collect the data. The CAS is a 28-item, 4-point Likert type self-report instrument that assesses computer anxiety levels with three subscales: Affective Anxiety (13 items), Damaging Anxiety (9 items), and Learning Anxiety (6 items). The Affective Anxiety subscale was developed to measure negative emotions such as fear, worry, and anxiety towards computers and includes items such as "I try to avoid computers as much as possible because I do not feel myself close to them." The Damaging Anxiety subscale is supposed to measure the fear of damaging computers and/or the work being done on computers

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