

Attitudes of Egyptian Teachers towards Computers

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Abstract

Appraisal of teacher attitudes towards computers has gained importance following the widespread availability of microcomputers in schools all around the world. This study aims at investigating Egyptian teachers' attitudes towards computers in terms of gender and years of teaching experience. Attitudes of a sample of 118 public school teachers, 53 (45%) male and 65 (55%) female, were assessed using 'The Attitude Towards Computer Instrument' (ATCI), developed by Shaft et al (2004), which is a Likert type instrument with three factors of affective, cognitive, and behavioral. The gathered data were analyzed using an analysis of variance (ANOVA). Findings showed that the Egyptian public school teachers' attitudes towards computers are positive. There were no significant differences in terms of gender and teaching experience. Recommendations for further research are provided.

Keywords: *Attitudes towards computers; ATCI; Teachers' attitudes; Egyptian teachers; Microcomputers in schools*

Introduction

Throughout the world there is awareness of the fundamental role of new information and communication technologies (ICTs) in the field of education. Theoretical and empirical studies have considered the importance of ICTs in the process of teaching and learning. Recently, the Ministry of Education in Egypt has also put great efforts and major financial investments to implement ICT into teaching and learning environments. The philosophy of the Ministry of Education (MOE) in Egypt regarding the use of technology in schools comes from the common believe that technology can make education and learning scientific, understandable, efficient, effective, and interesting. A special unit within the MOE, called the Technology Development Center (TDC), has been formed to coordinate the MOE's effort to infuse technology into schools (Warschauer, 2004).

In 1994, the TDC within the MOE planned for many ambitious projects to introduce computers into schools to modernize the education system. A great project was launched to equip every school with the latest desktop technology. Most of primary schools, all preparatory and secondary schools were provided with multimedia rooms and computer labs. Multimedia rooms have 2 to 3 computers, with LCD panels, large screens, and collections of curriculum-based courseware, and teachers were asked to bring in their classes on a regular basis. Computer labs were equipped with ten to twenty computers. These computers are used for teaching courses in computing (operating systems, computer applications, and programming languages).

Evaluation studies and reports showed that the multimedia rooms and computer labs are rarely used by teachers, and administrators do not encourage or support teachers and students to use them to enhance their teaching and learning (Warschauer, 2003a). Although MOE has invested a lot in equipping schools with computers, this investment has not been complemented by the development of appropriate human and social resources. Much greater emphasis should be placed on the development and evaluation of human and social resources through implementation of long-term teacher training programs and community involvement (Warschauer 2003b). Despite the expansion of ICT in Egyptian schools, the body of empirical research investigating the use of computers in classrooms and its relationship with other variables is still relatively small.

Actually, the user's acceptance is considered an important element in the successful implementation of technology in the instructional/educational setting, and which is greatly influenced by the users' attitudes towards technology. Moreover, Myers & Halpin (2002), Yildirim (2000), and Teo (2008) believe that attitudes towards computers and trust in using them in education are two major predictors for teachers' future use of technology in classrooms. Levin and Wadmany (2006–2007) emphasize the importance of a clear focus on teachers' attitudes, values, and beliefs as a primary focus in supporting teacher learning. A negative attitude may lead to computer resistance (Sheiderman, 1980), a phenomenon that can be found among experienced as well as inexperienced users (Negron, 1995). A negative attitude may even lead to defamation or sabotage of computer technology (Gibson & Rose, 1986). Gaining an appreciation of the teachers' attitudes towards computers use may provide useful insights into technology integration, and acceptance as well as usage of technology in teaching and learning.

Aiken (1996) conceptualizes an attitude as a "learned predisposition to respond positively to certain objects, situations, institutions, concepts or persons." As implied in this definition, attitudes possess cognitive (beliefs, knowledge, and expectations), affective (motivational and emotional), and performance (behavior or actions) components. A person's attitude toward a computer is influenced by a variety of aspects, e.g., computer liking, computer confidence, computer anxiety or comfort (Delcourt & Kinzie, 1993), achievement (Bandalos & Benson, 1990), usefulness, and value (Pelton & Pelton, 1996), age and gender (Colley & Comber, 2003; Kutluca, 2010), subject area and years of computer use (Teo, 2008), levels of technology use in classrooms (Al-Zaidiyeen et al., 2010) and self-efficacy (Rovai & Childress, 2002).

Chen and Chang (2006) indicate that attitudes, skills, and practice are interrelated variables. Their results also suggest that aspects of teacher technology competence vary according to number of teaching years, home computer access, and length of in-service training. In most cases, many of these factors interact with one another to impact on attitudes towards computers. However, the effect of gender on the formation of a person's computer attitudes is still a matter of debate and research findings are inconsistent. Previously, several studies have addressed this factor and revealed that males have a more positive attitude towards computers compared to females (Krendl 1989; Loyd 1987).

On the contrary, Barrier and Margavio's study (1992) showed that males attitude towards computer was more negative than that of females. Surprisingly, Yildirim's study (2010) which investigated 120 pre-service teachers' attitude towards computer showed no gender differences in attitude towards computer. Kay (1990) has stated that gender-related studies have produced conflicting results. Thus, understanding gender-based attitudinal difference is likely to have an important implication.

The relationship between years of teaching experience and computer attitude has not been given much consideration. In the Egyptian context, the only study (Sadik, 2006) which proved that more experienced teachers showed more positive attitudes towards computers. Accordingly, the researcher believes that there is a need for more studies to explore the relationship between years of teaching experience and attitudes towards computers.

More specifically, there are several studies conducted in Egypt and other countries in the region investigating the attitudes of teachers towards computers in schools. These studies may provide useful findings for better understanding the situation in Egypt.

Abdulkafi (2006) explored the attitude of high school English as Foreign Language (EFL) teachers in Syria toward ICT and investigated the relationship between computer attitude and five independent variables: computer attributes, cultural perceptions, computer competence, computer access, and personal characteristics (including computer training background). The findings suggest that teachers have positive attitude towards ICT in education and their attitudes were predicted by computer attributes, cultural perceptions, and computer competence. Moreover, the results clearly emphasized the importance of teachers' vision of technology itself, their experience in using it, and the cultural conditions surrounding its introduction into schools, on shaping teachers' general attitude towards technology and its subsequent diffusion in their educational practice.

Saracaloglu et al. (2010) analyzed the attitude of 419 candidate teachers towards computer in terms of various variables. Data were collected through two data gathering instruments. The study revealed that attitude of students towards computer was "very positive".

Al-Zaidiyeen et al. (2010) investigated the level of ICT use for educational purposes by teachers in Jordanian rural secondary schools; the study demonstrated the importance of teachers' attitude towards the use of ICT for educational purposes. A questionnaire was used for data collection and it was distributed among 650 teachers in Jordan. The survey included questions concerning the level of ICT use as well as questions related to the attitude of teachers towards the use of ICT. The findings revealed that teachers' level of ICT use for educational purpose was low although their attitude towards the ICT use was positive.

Cavas et al. (2010) study explored Turkish primary science teachers' attitudes towards ICT in education and (then) the relationship between teachers' attitudes and the factors related to teachers' personal characteristics (gender, age, computer ownership at home, and computer experience). The instrument (STATICTE) was developed by researchers and administered to 1071 science teachers. The results indicated that the Turkish science teachers have positive attitudes toward ICT; no gender differences have been traced in their attitudes towards ICT but differences were found in terms of their age, their computer skills (experience) and their ownership of computers at home.

The present study aims to find out computer attitudes of Egyptian teachers based on gender and teaching experience at different public schools in Egypt. In accordance with this objective, the study specifically focuses on the following research questions: (1) According to the attitude towards Computer Instrument (ATCI) and its subscales, what is the overall profile of Egyptian teachers' attitude towards computers; (2) Is there a difference on computer attitude in terms of gender; and (3) Is there a difference on computer attitudes according to years of teaching experience of teachers?

Methods

Research Model

Survey methodology was used in this study. This methodology helps researchers to obtain general results about the sample (Karasar, 2005). One of the main reasons employing survey methodology was that it could enable the researcher to go to the field and to collect data on the topic in question from a small sample of the population in a short period. As Robson (1997) stated surveys are often cross-sectional studies. That is, the focus is on the make-up of the sample and the state of affairs in the population at just one point in time. Researchers also suggest that it is convenient to carry out a survey study when the researcher has time and resource problems (Cohen et al. 2000). The survey in this study included a section assessing the independent variables; gender, teaching experience and dependent variables; attitude towards computer.

Sample

The participants in this study are 118 teachers at governmental secondary schools in Egypt. According to gender variable, 53 (45%) male and 65 (55%) female teachers participated in this study. Concerning the teaching experience variable, 27 teachers have less than 10 years (22%), 21 have more than 10 years (18%), 29 have more than 15 years (25%), and 41 have more than 20 years (35%). Table 1 illustrates the demographic of the sample as Table 2 shows the years of teaching experience.

Table1. Demographics of the Sample

Sex	Number	Percentage
Male	53	44.9
Female	65	55.1
Total	118	100.0

Table 2: Years of Teaching Experience

Teaching Experience	Frequency	Percentage
1- 10 years	27	22.0
11-15 years	21	17.8
16-20 years	29	24.6
20+ years	41	34.7
Total	118	100.0

Data Gathering

Data were collected from all participants during the first semester of the academic year 2010. Before distributing all questionnaires, the researcher introduced the topic of the research to

the participants who volunteered to respond to the questionnaire after being assured that data collected from them will not be used for teacher evaluation.

The tool used for collecting data required for this study is a questionnaire that consists of two parts. The first part provides information about the participants' demographic background: gender, teaching experience and the subject they teach. The second part is 'The Attitude towards Computer Instrument (ATCI), developed by Shaft et al. (2004). The ATCI is relatively short so as not to be tiresome for the participants. ATCI was developed using the semantic differential which is especially suited to assessing basic attitudes (Mehling, 1959) and has yielded consistently high reliability and validity scores across applications (Miller, 1964).

The items were randomly distributed throughout the ATCI, and four items were reverse scaled to limit response bias. Reverse scaling was accomplished by switching the anchors within an item so that a positive response became a low score (rather than a high score). Reverse scaling decreases the likelihood that a participant will select a response (usually high or low) and give that answer for every item. When using the instrument, the researcher recodes the score associated with reverse scaled items such that all positive responses are counted as a high score. The semantic differential format allows the reverse scaling to be removed by switching the anchors on those items per the preferences of the researcher.

ATCI is an eight-item scale that consists of three components of computer attitudes. The first component is the 'Affective' aspect which is composed of two items (2 and 7) and measures feelings towards computer, the 'Cognitive' aspect which is composed of two items (1 and 4) that measures the individual's beliefs about the usefulness of computers, and the 'Behavioral' aspect which is subdivided into two components, ease of use (3 and 6) and productivity (5 and 8). The total score of the eight items gives the general attitude towards computers.

Data Analysis

Responses of public school teachers to the questionnaire were statistically analyzed according to gender and teaching experience variables via SPSS software. The means (\bar{X}) and standard deviation (SS) scores were computed for each attribution. In the study, some parametric techniques such as t-test; one-way analysis of variance (ANOVA) based on the significance level of $\alpha=0.5$ were used to test the significance of the differences. In order to determine sources of the differences on means found in ANOVA, Scheffe test was used as a multiple comparison test.

Findings

Attitude towards computer was measured in terms of the Affective, Cognitive, and Behavioral subscales in the ATCI (Shaft et al. 2004). All 118 participants responded to all items in ATCI and no missing data were found in the questionnaire.

Table 3 presents the participants' mean scores with the standard deviations of the three subscales. The participants scored the lowest on the Affective aspect (mean = 8.47) followed by the cognitive aspect (mean = 10.37). The mean scores for the behavioral aspect is (mean = 15.46).

The means suggest that participants were more positive about their behavior towards computers than their perceptions of the affection of the computer and their cognition of the computer. At the global level, the overall computer attitude is well above the mid-point of the scale (28.00) and this finding indicated that participants generally held a positive attitude towards the computer.

Table 3. Mean Scores and Standard Deviations

	n	\bar{x}	SS
ATCI	118	31.73	5.51
Affective	118	8.47	2.51
Cognitive	118	10.37	2.97
Behavioral	118	15.46	3.31

In order to determine any gender differences in the attitude scores among teachers in public schools, an independent-samples t-test was conducted. The independent-sample t-test scores can be seen in Table 4.

Table 4. Gender Differences in Computer Attitudes

Subscale	Gender	n	Mean	SD	df	t
Affective	Male	53	5.17	3.161	116	2.294
	Female	65	6.49	3.078		
Cognitive	Male	53	10.55	3.154	116	0.658
	Female	65	10.18	2.828		
Behavioral	Male	53	15.60	2.970	116	0.406
	Female	65	15.35	3.594		
ATCI	Male	53	31.32	5.079	116	0.694
	Female	65	32.03	5.871		

The independent-sample t-test scores show no significant gender differences ($t=-0.690$; $p>0.05$) among the teachers' attitude towards computer. Based on scores, female teachers have a relatively higher ($\bar{x}=32.03$) attitude towards computers than males ($\bar{x}=31.32$). Also in terms of sub-scales, female teachers have a more positive attitude in the affective aspect ($\bar{x}=6.49$) than male teachers ($\bar{x}=5.17$).

To investigate the relationship between teachers' attitude towards computer and years of teaching experience, scores for years of teaching experience were categorized into four levels: from 1 to 10, from 11 to 15, from 16 -19, and from 20+ years of teaching experience. The ANOVA tests were used to analyze the differences among the four groups and their computer attitude.

The findings showed that teachers' attitude towards computer on the cognition aspect were affected by their teaching experience. Through a series of Scheffé tests (post hoc tests), it can

be concluded that in terms of teaching experience, there is no significant difference between the teachers' attitude towards computer (Table 5 & &).

Table 5. Descriptive Statistics on Teaching Experience

	From 1 to 10 Years (n= 27)		From 11 to 15 Years (n= 50)		From 16 to 19 Years (n= 78)		From 20+ Years (n= 41)	
	×	SS	×	SS	×	SS	×	SS
ATCI	32.25	6.32	31.51	4.77	30.62	5.42	32.42	5.62
Affective	18.14	2.39	8.45	2.73	9.07	2.58	8.27	2.37
Cognitive	9.29	3.11	10.58	2.92	9.59	2.92	11.69	2.4
Behavioral	15.92	3,31	15.25	2.62	14.66	3.24	15.93	3.91

Table 6. Summary of One-way ANOVA on Class Level

	Source	Sum of Squares	df	Mean Square	F
Affective	Between Groups	67.659	3	22.553	2.318 not sig
	Within Groups	1109.121	114	9.729	
	Total	1176.780	117		
Cognitive	Between Groups	107.382	3	35.794	4.410 sig
	Within Groups	925.373	114	8.117	
	Total	1032.754	117		
Behavioral	Between Groups	26.959	3	7.986	.813 not
	Within Groups	1260.405	114	11.056	
	Total	1287.364	117		
ATCI	Between Groups	41.614	3	13.871	.449 not
	Within Groups	3520.590	114	30.882	
	Total	3562.203	117		

Conclusions and Recommendations

The findings of this study indicate that teachers' attitude towards computer at governmental schools is relatively high and that no significant gender differences exist among them. This suggests that both Egyptian male and female teachers at governmental schools have the same perception about computer.

Concerning gender differences in teachers' attitude towards computer, Shapkaa & Ferrarib, (2003) reports displayed some differences while others like Gressard and Loyd (1986), Woodrow (1992) did not display any significant gender differences. However, results of other studies showed that female teachers manifested higher levels of anxiety in their attitude towards computers more than male teachers (Sadik, 2005; Samak, 2006).

According to North and Noyes (2002), using ICTs is widely perceived as a masculine activity and their research provided evidence for a correlation between gender and technophobia (cited in

Samak, 2006). Female teachers have been found to be more anxious and less confident computer users in most of the studies than male teachers. Research on gender and computing has often reported, though not conclusively, that male teachers have more experience and make more use of computers (Balka & Smith, 2000; Brosnan & Lee, 1998). Research on computer self-efficacy in general also revealed that males on average tend to acquire computer self-efficacy faster than females (Todman, 2000).

Gender differences in teachers' attitude towards computer are almost absent in the present study and this conforms to previous research that revealed the change of female computer users' attitude. For example, females today appear to be more comfortable when using computers than before and this may have resulted in lessening the barriers perceived by females in the lack of training opportunities for them (Ray & Harris, 1999). Moreover, North and Noyes (2002) believed that the increased use of computers in teaching and learning at schools - similar to the situation at Egyptian schools - has diminished gender differences among teachers' attitude towards computer.

In terms of teaching experience, results prove that there are no significant differences among teachers' attitude towards using computer at governmental schools. This result does not support Sadik's study (2006) which indicates that teachers who have longer teaching experience are more likely to appreciate the importance of computer use in schools. However, this can be attributed to the attitude of the Egyptian Ministry of Education, which has encouraged the use of computers in teaching at schools as an effective method to provide a high quality of education for students. This can be exemplified in providing in-service computer programs to most of the teachers of all levels at the governmental schools in Egypt regardless to their teaching experience.

More studies are needed to investigate teachers' attitudes towards computers in terms of years of teaching experience, subject matters, teachers' monthly income, self-efficacy and in-service training programs attended. In addition, some research may tackle the relationship between teachers' attitudes and students' attitudes towards computer in Egyptian schools at different levels. Ministry of Education in Egypt is requested to provide more in-service training for teachers, on using technology in the classroom and to support them with more effective instructional materials and teaching models. In addition, courses related to instructional media and technologies at the Faculties of Education should be re-constructed and made obligatory if possible.

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