A Study To Assess Teacher Educators' Attitudes Towards Technology Integration In Classrooms

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The aim of this study was to assess the teacher educators' attitudes towards technology integration in classrooms. 21 teacher educators from a teacher education college of north India participated in this study. The data were collected with the help of a Teacher Educators' Attitude towards ICT Scale containing forty items. The results show that most of the teacher educators have positive attitudes towards the general role that information and communication technology can play in education and in the educational process. The findings also reveal that no gender differences exist on attitudes towards ICT in teacher training. Further analysis shed light on differences in attitudes with respect to age.

KEYWORDS: Attitude Towards Technology, Technology Integration, Teacher Education

INTRODUCTION AND BACKGROUND

Advances in technology have caused vital changes in many domains of societal and individual life. As such, technology has also influenced the way education at all levels was done. As an innovative tool, technology has played a central role in improving teaching and learning in light of educational reforms around the globe (Kahveci, Sahin and Genc, 2011). Numerous scholars argue that integrating technology and education can enhance teaching and learning activities in ways that can support student-centered teaching with more active

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student involvement in the learning process (Alexander, 1999; Beal, 2000; Cajas, 2001; Cope and Ward, 2002; Edelson, 2001; Jarvela, Bonk, Lehtinen and Lehti, 1999; Jonassen, Hernandez-Serrano and Choi, 2000; Lancashire, 2000; Scheffler and Logan, 1999).

For educational practices to benefit from technology in an optimum way, a number of factors need to be taken into consideration. Two of these are technological infrastructure and teachers, the implementers of curricula (Erkan, 2003). Similar to Erkan's assertion, Chai and Khine (2006, as cited in Teo, Chai, Hung and Lee, 2008) argue that teachers' technology use is influenced by factors which can be classified in two broad categories, external environmental factors and the personal teacher characteristics. Also, according to Chou (2003) the two among the several factors of limited or no use of computers and Internet are lack of knowledge and skills as well as insufficient technological equipment. On one hand, in recent years, technology and computers require lesser financial resources, thus spreading at faster rates (Cepni, Tas and Kose, 2006; Newhouse and Rennie, 2001). On the other hand, teachers have always been the central agents in the utilization of any reform-based innovation. As Arslan (2003) underscores, a school with an adequate technological base may not succeed to provide technology supported education if teachers are not willing to do so and do not carry a positive attitude toward using technology in their teaching.

If the goal is to promote technology enhanced education, it is of primary importance to investigate what teachers perceive of technology and its use in education, what their knowledge and skills are or what skills they need to further develop (Kahveci, Sahin & Genc, 2011). Sadik (2006) in his study in Egypt reported that the more positive teachers' attitudes were toward technology the more likely they were to integrate it in classroom.

Various studies conducted in different countries on teacher attitudes, including Turkey, revealed positive attitudes toward technology and computers (Cagiltay, Cakiroglu, Cagiltay, and Cakiroglu, 1998; Hong & Koh, 2002; Ng and Gunstone, 2003). A number of scholars concluded that attitudes were more strongly influenced by prior computer experiences than by gender (Badagliacco, 1990; Levin and Gordon, 1989). Hong and Koh (2002) and Sadik (2006) also established a gender relationship with positive attitudes toward computers in favour of males. Others reported that computers have not been used by teachers for professional purposes as much as for other personal interests (Toprakci, 2005).

The excess of studies conducted on teacher characteristics including perceptions, beliefs and attitudes indicate the primacy of understanding what drives teachers to integrate technology in their teaching. In contemporary society, issues related with providing sound technology infrastructure in schools have almost faded out as the costs have become more affordable in

recent years with policy makers attending to these issues more closely.

The teacher factor is yet to be resolved, thus continuing to draw the attention of educational researchers, teacher educators, curriculum developers and stakeholders in promoting educational reform. Various studies conducted in various settings continue to add to the literature on technology integration by rendering perspectives on the complex issue of teacher characteristics, influential in technology use. Uncovering common patterns related with the teacher factor may enable taking joint action or simply, be inspiring and directive for those responsible from transforming education in their own contexts.

There is the need therefore for research position on this study. Previous studies have investigated age and ICT-related behaviours of teachers in primary and secondary schools; few have carried out this study on teachers of teachers whose behaviours would model that of their trainees. It is on this note that the present study seeks to investigate the influence of age on ICT-related behaviours of teacher educators. Also, there is dearth of studies on gender and ICT-related behaviours of teacher educators in India, so the researcher was interested to take up this study.

REVIEW OF RELATED LITERATURE

The success of any initiatives to implement technology in an educational programme depends strongly upon the support and attitudes of teacher educators involved. It has been suggested that if teachers believed or perceived proposed computer programme as fulfilling neither their own or their students' needs, they are not likely to attempt to introduce technology into their teaching and learning. Among the factors that affect the successful use of computers in the classroom are teachers' attitudes towards computers (Huang and Liaw, 2005). Attitude, in turn, constitutes various dimensions. Some examples of these are perceived usefulness, computer confidence (Rovai and Childress, 2002), training (Tsitouridou and Vryzas, 2003), gender (Sadik, 2006), knowledge about computers (Yuen, Law and Chan, 1999), anxiety, confidence, and liking (Yildirim, 2000).

In support of the importance of teachers' attitude towards computer use, Zhao, Tan and Mishra (2001) provided evidence to suggest that the attitudes of teachers are directly related to computer use in the classroom. For example, teachers often view the computer as a tool to accomplish housekeeping tasks, manage their students more efficiently, and to communicate with parents more easily. The success of student learning with computer technology will depend largely on the attitudes of teachers, and their willingness to embrace the technology (Teo, 2006). Gaining an appreciation of the teachers' attitudes towards computer use may provide useful insights into technology integration

and acceptance and usage of technology in teaching and learning.

In many developed countries, nearly all schools are equipped with the infrastructure to conduct ICT mediated teaching and learning. Positive teacher attitudes towards computing are critical if computers are to be effectively integrated into the school curriculum. A major reason for studying teachers' attitude towards computer use is that it is a major predictor for future computer use in the classroom (Myers and Halpin, 2002). Khine (2001) studied 184 pre-service teachers and found a significant relationship between computer attitude and its use in the institution. This finding was corroborated by Yuen and Ma (2001) who, using the Chinese Computer Attitude Scale for Teachers (CAST), found that 216 secondary teachers in Hong Kong had reported the instructional use of computers and their results revealed that affective attitudes, general usefulness, behavioural control, and pedagogical use to be significant in determining the use of ICT. Kumar and Kumar (2003) reported that most teachers believe that the amount of computer experience has a positive effect on attitude towards computers. Jackson, Ervin, Gardner and Schmitt (2001) indicated that female users, compared with males, are more inclined to hold negative reactions to computers and such differences may have resulted in the different ways of using computers. Using technology enables pre-service teachers to arrange their environment and adjust their instructional strategies (Zhang and Espinosa, 1997). On the part of teacher educators, there is a need to understand the dimensions that influence pre-service teachers' attitudes towards computers as a means for effective development of teacher training curriculum that will prepare teachers to face the challenges in the information age (Fisher, 2000).

Research results in some developed nations revealed narrowing gaps across age groups in ICT related behaviours. For example Helpguide (2004) found that older Americans are exhibiting better computer behaviour than in the former years. This position finds support in Luchetta (2000) but this narrowing gap across age groups in ICT related behaviour is not a global trend, for example, examining Norway's situation, Hernes, Hestman and Haeland (2000) observed that the share of teachers who state that they have a good command of the use of the Internet is negatively correlated with age. About 77% of the teachers who are 25 years or younger stated that they have a good command of the use of Internet, compared to 25% of the teachers who are 56 years or older. Also around 63% of the teachers who are 25 years or younger versus only 32% of the teachers who are 56 years or older have a positive attitude towards the use of the Internet in their own teaching. This is also consistent with the findings of Liang and Chao (2002) as they obtained that Taiwan younger teachers were the more literate on Internet.

Also, it is usual to consider the issue of gender in the context of ICT-related behaviours of teacher educators. For example, Chua, Chen and Wong (1999)

and Coffin and Mackintyre (2000) in their meta-analyses on the relationships between computer anxiety, computer attitudes, computer self efficacy and computer experience stated that most findings usually reinforce the gender effects and suggested that greater levels of computer experience are associated with lower computer experience and more positive computer attitudes. Females usually also have more negative attitudes towards computers (Durndell and Thompson, 1997) and greater computer anxiety (McIlroy, Bunting, Tierney and Gordon, 2001) than males. Research on computer self-efficacy in general also revealed that males on average tend to acquire computer self-efficacy faster than females (Todman, 2000).

OBJECTIVES OF THE STUDY

The study has the following objectives:

1. To study the attitude of teacher educators towards ICT.
2. To study the attitude of teacher educators towards ICT in relation to their gender.
3. To study the attitude of teacher educators towards ICT in relation to their age.

HYPOTHESES

1. Teacher educators do not have positive attitude towards ICT.
2. There is no significant difference in the attitude of teacher educators towards ICT in relation to their gender.
3. There is no significant difference in the attitude of teacher educators towards ICT in relation to their age.

METHODOLOGY

SAMPLE

Twenty one teacher educators (7 males and 14 females) were selected from one of the prestigious institutes of teacher education in North India. The sample selection made use of cluster sampling procedure.

TOOL USED

The study made use of one research instrument namely Teacher Educators' Attitude towards ICT Scale developed by Sharma, 2010. This scale comprised of 40 items under five subscales namely Curiosity to Use Technology, Potential to Use Technology, Comparative Use of Technology, Innovativeness and Role in Improvement. The items were scored as Strongly agree =5, Agree = 4, Not sure= 3, Disagree =2, Strongly disagree = 1. The overall score yields teacher educators' ICT attitude. The scale was found to be reliable (Cronbach's

reliability co-efficient on the overall scale measured 0.86) and valid.

PROCEDURE

The research instrument was administered on the teacher educators. The data were collected personally by the researcher. The purpose of the research and instructions were made clear to the teacher educators.

RESULTS

The resulting data were analysed using percentages and analysis of variance. The results have been explained under the below mentioned headings.

TEACHER EDUCATORS' ATTITUDE TOWARDS ICT

To determine the teacher educators' attitude towards technology, responses of teacher educators on Attitude Scale were tabulated and analysed with the help of spss. The total mean scores as well as scores in subscales have been summarised in table 1.

TABLE 1

Mean Value of Teacher Educators' Scores with respect to Subscales of Attitude Scale

Sub Scale	N	Mean	Std Deviation
Curiosity to Use	21	4.07	0.49
Potential of Technology	21	4.06	0.47
Comparative Use of Technology	21	4.16	0.42
Innovativeness	21	4.07	0.41
Role in Improvement	21	4.20	0.49
Overall Attitude	21	4.01	0.33

Results as presented in Table 1 reveal that in each sub scale the mean value of scores lies in between 4 and 5. This may imply that, most of the teacher educators strongly agree/agree with the items given in the Attitude Scale. Overall attitude of teacher educators was found to be positive towards the use of technology. Hence, the research hypothesis no. 1 is rejected.

Teacher Educators' Attitude towards ICT with respect to their Gender

In order to find out if there are any gender differences on the Attitude Scale, the data was analysed using One Way ANOVA, the results of which are presented in Table 2.

Table 2

One Way ANOVA Summary of Scores of Teacher Educators on Attitude towards ICT Scale with respect to their Gender

Sub Scale	Gender	N	Mean	S.D.	F
Curiosity to Use	Male	7	4.05	0.51	0.02
	Female	14	4.08	0.51	
Potential of Technology	Male	7	3.97	0.60	0.42
	Female	14	4.11	0.41	
Comparative Use of Technology	Male	7	4.20	0.43	0.09
	Female	14	4.14	0.44	
Innovativeness	Male	7	4.00	0.47	0.35
	Female	14	4.11	0.38	
Role in Improvement	Male	7	4.26	0.60	0.13
	Female	14	4.18	0.45	
Overall Attitude	Male	7	4.08	0.41	0.06
	Female	14	4.12	0.29	

Results in Table 2 reveal that neither on sub scales nor on the total attitude value, there are significant differences with respect to gender of teacher educators. This may indicate that male and female teacher educators do not differ significantly with respect to their attitude towards technology. In the light of the present finding, the research hypothesis no. 2 has been accepted.

Teacher Educators' Attitude Towards ICT with Respect to their Age

To know if there were any differences on the attitude of teacher educators towards ICT with respect to their age, the data was statistically analysed, the results of which are presented in Table 3.

Table 3

One- Way-Anova Summary of Scores of Teacher Educators on Attitude Towards ICT Scale with Respect to their Age

Scale	Age (years)	N	Mean	S.D.	F
Curiosity to Use	<=31	7	3.96	0.48	0.35
	32 – 38	6	4.06	0.48	
	39 – 45	8	4.18	0.55	
Potential of Technology	<= 31	7	3.79	0.35	3.20*
	32 – 38	6	4.31	0.26	
	39 – 45	8	4.11	0.58	
Comparative Use of Technology	<= 31	7	3.97	0.35	0.98
	32 – 38	6	4.26	0.45	
	39 – 45	8	4.25	0.45	

Innovativeness	<= 31	7	4.08	0.47	0.63
	32 – 38	6	4.21	0.44	
	39 – 45	8	3.96	0.33	
Role in Improvement	<= 31	7	4.19	0.51	1.95
	32 – 38	6	4.50	0.39	
	39 – 45	8	4.00	0.47	
Overall Attitude	<= 31	7	3.98	0.27	1.07
	32 – 38	6	4.24	0.28	
	39 – 45	8	4.11	0.38	

*Significant at 0.05 level.

Table 3 shows that teacher educators belonging to the three age groups i.e.<=31, 32-38 and 39-45 years did not differ with respect to their curiosity to use technology, comparative use of technology, innovativeness, role in improvement and overall attitude. However, they differed significantly at 0.05 level of significance with respect to potential to use technology. This means that significant differences do exist among teacher educators belonging to different age groups with respect to potential to use technology. Hence, the research hypothesis 3 is partially accepted.In order to explain as to which group significantly differs from the other groups, the significance of differences were computed by determining multiple comparisons by Dunnett T3 post hoc test as presented in Table 4.

Table 4

Multiple Comparisons Showing Group Differences among Teacher Educators of Different Age Groups on Teacher Educators' Attitude towards Technology Scale

Dependent Variable	(I) Age (Banded)	(J)Age (Banded)	Mean Difference (I-J)	Std. Error
Potential of Technology	<= 31	32 – 38	-0.52*	0.17
		39 – 45	-0.31	0.25
	32 – 38	39 – 45	0.20	0.23

*Significant at 0.05 level.

The analysis of result as shown in Table 4 reveals that there is a significant difference in sub scale 2 (potential of technology) between 1st(<= 31 years) and 2nd (32-38 years) age groups. From this finding, it can be concluded that 1st group i.e. younger age group scored lower than the middle age group(2nd). This means that middle age group rated significantly higher for the potential of technology i.e. contribution/importance of technology.However, there are no significant differences emerged among 1st and 3rd ; 2nd and 3rd age groups.

DISCUSSION

Overall, the teacher educators showed positive attitude towards technology usage, as shown by the mean score for each subscale being 4.0 and above (on a 5-point scale). The overall positive level of attitude towards technology could be attributed to the availability and accessibility to computers and ICT equipment provided to the teacher educators at their college.

This study found no significant differences in the attitude towards technology of teacher educators with respect to their gender. This finding does not support past research which suggested significant differences in computer attitudes by gender (e.g. Margolis & Fisher, 2002; Markauskaite, 2006). For example, Houtz and Gupta (2001) found that males and females had rated themselves on their ability to use the computer in significantly different ways. Other studies have suggested that the masculine image of the computer has deterred females from benefiting from the technology and this has made them less confident or more anxious (Culley, 1988), resulting in females holding more negative attitudes to computers than males (Campbell, 1990). Consequently, female students tended to use computers less even when given equal access (Muira, 1987). The research on gender and computing has often reported, though not conclusively, that males have more experience and make more use of computers (Brosnan & Lee, 1998; Balka & Smith, 2000).

The lack of differences in computer attitude between genders in this study is consistent with research that revealed changing attitudes among female computer users. For example, females may have been socialised differently in today's computer generation to be more comfortable with computers and this may have resulted in lessening the barriers perceived by females, in the lack of training opportunities for them (Ray, Sormunen & Harris, 1999). To a large part, North and Noyes (2002) felt that increased use of computers for teaching and learning in schools has worked against the development of gender differences as reported in previous research, a situation consistent with the use of computers in the Singapore schools (Teo, 2006).

Next finding of this study revealed significant difference in attitude towards technology with respect to age of teacher educators. Younger age group scored lower than the middle age group. However, no significant differences emerged among younger and older; middle and older age groups. Research results insome developed nations revealed narrowing gaps across age groups in ICTrelated behaviours. Luchetta (2000)found that narrowing gap across age groups in ICT related behaviour is not a global trend, for example,examining Norway's situation, Hernes, Hestman and Haeland (2000) observed that the shareof teachers who state that they have a good command of the use of the Internet is negatively correlatedwith age. About 77% of the teachers who are 25 years or younger stated that they have agood command of the use of Internet, compared to 25% of the teachers who are 56 years or older.

Also around 63% of the teachers who are 25 years or younger versus only 32% of the teacherswho are 56 years or older have a positive attitude towards the use of the Internet in their ownteaching. This is also consistent with the findings of Liang and Chao (2002) as they obtained that Taiwan younger teachers were the more literate on Internet.

CONCLUSION

The study points out to the fact that almost all of the teacher educators were willing to use technology in their courses effectively as understood by their positive attitude towards ICT. Having so many academicians in a positiveattitude towards technology is a good thing for any institution and would be helpful in attaining effectiveintegration of ICT in the academic programme.The results showed that in general, all the teacher educators were in favour of using technology. This positive attitude is an important indicator of willingness and first step ineffective integration. As per the findings of present study, in the younger age group and middle age group, significant differences were observed with respect to potential in the use of technology. Younger group scored lower than middle age group. However, gender is not a determining factor in the attitudes towards technology in teacher training. The lack of ICT attitude differences between genders in this study is consistentwith research that revealed changing attitudes among female computer users. Forexample, females may have been socialised differently in today's computer generationto be more comfortable with computers and this may have resulted in lessening thebarriers perceived by females, in the lack of training opportunities for them (Ray, Sormunen & Harris, 1999).

Teachers are change agents in schools. They are key drivers who play crucial roles intechnology integration in the schools and classrooms. It is important for them topossess positive computer attitudes since attitudes has been found to be linked tousage and intention to use, variables that determine successful technology integrationin education. In other words, computer attitudes, whether positive or negative, affecthow teachers respond to technology in an instructional setting or learningenvironment. This in turn affects the way students react to computers in schools (Teo, 2006) and current and future computer usage. Despite the high level of technology inschools, the extent to which it is optimised depends on teachers having a positiveattitude towards it (Huang & Liaw, 2005). This study suggests a need for teachereducators to provide a conducive and non-threatening environment for pre-serviceteachers to experience success in using the computers, with a view to allowing pre-serviceteachers to gain competence and confidence in using computers for teaching and learning.

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