Knowledge of Computers among Prospective Teachers

Madhu Sahni*

ABSTRACT

The purpose of the present investigation was to assess the level of knowledge of computers among prospective teachers and to study the influence of type of college, gender, attitude towards computers and their various interactions on knowledge of computers among prospective teachers. The sample comprised 320 prospective teachers selected randomly from six B.Ed. colleges affiliated to M.D.U., Rohtak. Data were analysed by adopting the criterion Mean ± SD and using three-way ANOVA (2x2x2 factorial design) and t-test. Results indicated that (i) most of the prospective teachers got comparatively moderate level of knowledge of computers; (ii) there is significant independent effect of variables viz. type of college, gender and attitude towards computers on knowledge of computers among prospective teachers; and (iii) there is significant two factor and three factor interactive effect of variables on knowledge of computers among prospective teachers.

Introduction

In the present era, the development in various aspects of computer technology has reached beyond our imagination and expectations. As computer becomes part and parcel of our life, knowledge of computers is very much needed for everyone. Learning about computers is one of the major ways through which students acquire

* *Assistant Professor*, Vaish College of Education, Rohtak

experience with new Information Technology (IT). This is important because using computer and computer applications require a certain amount of basic knowledge and skills with regard to the functioning of computers and software packages. Hence, computer has become an unavoidable instrument now in all the field of human life.

In the field of education it has created revolution and is very useful in teaching-learning process and content of education. Therefore, computer literacy is very much required for teachers as well as students. Pelgrum and Plomp (2000) are of the view that students need to have certain generic knowledge (for example of hardware components and software packages) and should understand some basic principles of how to operate software packages and computer equipments of different types, such as how to switch on a machine, how to start a programme, how to store information, what is a mouse, etc.

Favourable attitude towards computers plays a very important role in making one really interested in it. Fishbein and Ajzen (1975) introduced a theory, which proposed that, computer attitude affect user's behavioural intentions (future desires) that in turn affect actual computer usage (experience). When there is clear linkage between the target action and any attitudes that are formed, the degree of predictability will be highest. So unless the teachers possess a favourable attitude towards computers, they may not be interested in it, which in turn will affect their knowledge of computers and also they will find learning with help of computer difficult, which in turn will affect students' learning. Reece and Gable (1982) noted that introducing computers into schools without developing students' positive attitudes towards computers would be a waste of time and money. On the other hand, having negative attitude towards computers may lead students to resist learning about computers and affect acceptance of technology use.

In this context, teacher education institutions, which have a responsibility to prepare teachers, cannot afford to take back seat. Looking to the technological competency to be developed on the part of the teachers the input of IT in education at pre-service level is introduced. So teacher educators are the central actors who hold the key to develop in the prospective teachers the appropriate knowledge of computers and essentials skills in working with them.

To fall in line with this, an attempt has been made to study knowledge of computers among prospective teachers. Keeping in view the importance of attitude in learning and fast opening self-financing colleges of education, type of college of education (self-financing/

government aided) and attitude towards computers are taken as independent variables.

Operational Definition of the Terms

Prospective Teachers: Pupil teachers or teacher trainees enrolled in B.Ed. course during the session 2008–2009.

Knowledge of Computers: Knowing about the various fundamental aspects of computers, the basic skills involved in the operation of computers, and the function of computer applications.

Attitude towards computers: Subject's feelings, beliefs and perceptions towards general computer use.

Type of college of Education: Government-aided colleges, which receive grant from UGC or self-financing colleges which don't receive any grant from UGC and are purely running on commercial basis.

Objectives

1. To study the level of knowledge of computers among prospective teachers.
2. To study the influence of type of college, gender, attitude towards computers and their various interactions on knowledge of computers among prospective teachers.

Hypothesis

There is no significant influence of type of college, gender, attitude towards computers and their various interactions on knowledge of computers among prospective teachers.

Tools Used

Following tests were used to obtain reliable data:
1. Computer Knowledge Test by Aziz (2004).
2. Computer Attitude Scale (CAS, 2005) by Loyd and Gressard.
3. Intelligence Test by S.M. Mohsin.
4. Personal Information Schedule (PIS) developed by investigator to get the information like gender, name of college, prior computer training, possession of PC at home, etc.

Sample and Procedure

Data were collected in July–Aug 2009, when the prospective teachers were ready to appear in B.Ed. final practical examination of information technology after taking theory exams. For collecting data, six colleges of education (three government aided and three self-financing) affiliated to M.D.U., Rohtak, were selected randomly from Haryana. Due to mushrooming growth of colleges of education in

Haryana, present state of affairs indicates that colleges of education have variance with a wide margin mainly on count of attending or non-attending prospective teachers. So it is worth mentioning that in these six colleges of education regularity of prospective teachers prevailed.

The investigator personally visited the colleges one by one. After rapport formation she administered the tools to all prospective teachers present on the day. After collecting the tools back, those cases were discarded who had computer training from computer institute or who had Personal Computer (PC) at their homes or who did not belong to moderate level of intelligence; as review suggested that students who own computer has more computer knowledge than those who do not (Al-Badar, 1993) and IQ has significant relationships to students' achievement regarding knowledge of computers (Tipton, 1991). Then on the basis of Mean and S.D., the prospective teachers of government-aided and self-financing colleges of education were divided into four parallel groups — males having favourable attitude towards computers, males having unfavourable attitude towards computers, females having favourable attitude towards computers and females having unfavourable attitude towards computers. From each of these groups, 40 prospective teachers were selected randomly, that is 40 from each combination group. In this way final sample comprised 320 prospective teachers as given in Table 1.

Table 1
Distribution of Sample

Type of College	Male Prospective teachers (160)		Female prospective teachers (160)	
Governmnet Aided (160)	Having favourable attitude (40)	Having unfavourable attitude (40)	Having favourable attitude (40)	Having unfavourable attitude (40)
Self-financing (160)	Having favourable attitude (40)	Having unfavourable attitude (40)	Having favourable attitude (40)	Having unfavourable attitude (40)

(*Note* : N = 320)

Statistical Techniques Employed

To find out the level of knowledge of computers among prospective teachers criterion of Mean±SD was applied to scores of knowledge of computers. In order to study the influence of type of college, gender, attitude towards computers and their various interactions on

knowledge of computers three way ANOVA (2×2×2 factorial design) was employed. The first independent variable type of college (A) varied in two ways — Aided (A_1) and Self financing (A_2); the second independent variable gender (B) varied in two ways — Males(B_1) and Females (B_2); and the third independent variable attitude towards computers (C) varied in two ways — favourable (C_1) and unfavourable (C_2). In case of significant main effects as well as interactions, the ANOVA was supplemented by *t*-test.

Analysis and Interpretation

In pursuance of the objectives data were analysed and interpreted under the following heads:

1. *Level of knowledge of computers among prospective teachers*

320 subjects were classified into three groups by adopting the criterion of Mean ±SD to their score value in computer knowledge test as follows:

Table 2
Classification of Subjects into Three Groups on the Basis of their Score in Computer Knowledge Test

Sr. No	Level of knowledge	Range of Scores	N (%)
1.	High	24 or above	64(20%)
2.	Moderate	17–24	172(54%)
3.	Low	17 or below	84(26%)

Results in Table 2 reveal that majority of prospective teachers had moderate (54%) followed by low computer knowledge (26%). A small percentage of subjects (20%) fell in the category of high computer knowledge.

2. *Influence of type of college, gender, attitude towards computers and their various interactions on knowledge of computers among prospective teachers*

The summary of ANOVA (2×2×2) is given in Table 3.

Table 3
Summary of 2×2×2 Factorial Design ANOVA of Knowledge of Computers

Source of Variance	d f	Sum of squares	Mean Squares	F-value	Remark
A	$df_A = 1$	$SS_A = 1730$	$MS_A = 1730$	$F_A = 455.26$	P<.01
B	$df_B = 1$	$SS_B = 720$	$MS_B = 720$	$F_B = 189.47$	P<.01

C	$df_C = 1$	$SS_C=556$	$MS_C=556$	$F_C=146.32$	P<.01
A×B	$df_{A\times B}=1$	$SS_{A\times B}=174$	$MS_{A\times B}=174$	$F_{A\times B}=45.79$	P<.01
B×C $df_{B\times C}=1$	$SS_{B\times C}=177$	$MS_{B\times C}=177$	$F_{B\times C}=46.58$	P<.01	
A×C $df_{A\times C}=1$	$SS_{A\times C}=23.21$	$MS_{A\times C}=23.21$	$F_{A\times C}=6.11$	P<.05	
A×B×C $df_{A\times B\times C}=1$	$SS_{A\times B\times C}=148.47$	$MS_{A\times B\times C}=148.47$	$F_{A\times B\times C}=39.07$	P<.01	
Within SS	$df_W=312$	$SS_W=1185.75$	$MS_W=3.8$		
Total	319	4714.68			

(*Note* : N = 320)

2.1 Knowledge of Computers by Type of College

From table 3 it can be seen that the F-value for type of college is 455.26, which is significant at 0.01 with df = 1/312 . It shows that type of college significantly influenced the knowledge of computers among prospective teachers. Thus the null hypothesis that there is no significant influence of type of college on knowledge of computers among prospective teachers is rejected. In order to interpret this, *t*-test was applied. The results for the same have been given in Table 4.

Table 4
Type of college wise Mean, SD and *t*-value of
Knowledge of Computers

Group	N	Mean	SD	t-value	Remark
A_1	160	21.76	3.95	6.53	P<.01
A_2	160	19.12	3.25		

From Table 4 it is evident that t-value is 6.53, which is significant at 0.01 level of significance. It indicates that the mean scores of knowledge of computers among prospective teachers of aided and self-financing colleges differ significantly. Thus, the null hypothesis that there is no significant difference in mean scores of knowledge of computers among prospective teachers of aided and self-financing colleges is rejected. Further, mean score of knowledge of computers among prospective teachers of aided colleges is 21.76, which is significantly higher than that of prospective teachers of self-financing colleges, whose mean score of computer knowledge is 19.12. It may therefore be said that knowledge of computers was found to be significantly higher in case of prospective teachers of aided colleges in comparison to prospective teachers of self-financing colleges.

2.2 Knowledge of computers by gender

The F-value for gender of prospective teachers is 189.47 (vide Table 3), which is significant at 0.01 level. It reflects that there is significant influence of gender on knowledge of computers among prospective teachers. Thus the null hypothesis that there is no significant influence of gender on knowledge of computers among prospective teachers is rejected. In order to interpret this t-test was applied. The results are as given in Table 5.

Table 5
Gender Wise Mean, SD and *t*-value of
Knowledge of Computers

Gender (B)	N	Mean	SD	t-value	Remark
Male (B$_1$)	160	21.93	4.26	7.48	P<.01
Female (B$_2$)160	18.94	2.64			

From Table 5 it is evident that t-value is 7.48, which is significant at 0.01 level of significance. It indicates that the mean scores of knowledge of computers among male and female prospective teachers differ significantly. Thus, the null hypothesis that there is no significant difference in mean scores of knowledge of computers among male and female prospective teachers is rejected. Further, mean scores of knowledge of computers among male prospective teachers is 21.93, which is significantly higher than that of female prospective teachers whose mean score of knowledge of computers is 2.64. It may, therefore, be said that knowledge of computers was found to be significantly more in case of male prospective teachers in comparison to female prospective teachers.

2.3 Knowledge of computers by attitude towards computers

The F-value for attitude towards computers of prospective teachers is 146.32 (vide Table 3), which is significant at 0.01 level. It may, therefore, be said that attitude towards computers significantly influenced knowledge of computers among prospective teachers. Thus, the null hypothesis that there is no significant influence of attitude towards computers on knowledge of computers among prospective teachers is rejected. In order to interpret this, *t*-test was applied. The results have been given in Table 6.

Table 6
Attitude towards Computers Wise Mean, SD and
t-value of Knowledge of Computers

Attitude towards Computer (C)	N	Mean	SD	*t*-value	Remark
Favourable (C_1)	160	22.76	3.28	13.68	P<.01
Unfavourable (C_2)	160	18.11	2.84		

From Table 6 it is evident that *t*-value is 13.68, which is significant at 0.01 level of significance. It indicates that the mean scores of knowledge of computers among prospective teachers having favourable and unfavourable attitude differ significantly. Thus, the null hypothesis that there is no significant difference in mean scores of knowledge of computers among prospective teachers having favourable and unfavourable attitude towards computers is rejected. Further, mean scores of knowledge of computers among prospective teachers having favourable attitude towards computers is 22.76, which is significantly higher than that of prospective teachers having unfavourable attitude towards computers whose mean score of knowledge of computers is 18.11. It may, therefore, be said that knowledge of computers was found to be significantly more in case of prospective teachers having favourable attitude towards computers in comparison to prospective teachers having unfavourable attitude towards computers.

2.4 Two Factor Interaction Effect on Knowledge of Computers

2.4.1 A x B Interaction

The F-value for the double interaction between Types of college and Gender (A x B) is 45.79 (vide table 3 for df= 1/312) is significant at 0.01 level, leading to inference that the two variables interact with each other. To investigate further, the interaction between type of college and gender, the t-ratios were computed. The results for the same have been given in Table 7.

Table 7
Significance of Difference of Mean scores of Knowledge of Computers among Different Combination Groups for Type of College x Gender

Group (Mean)	A_1B_1 (24)	A_1B_2 (19.51)	A_2B_1 (19.88)	A_2B_2 (18.36)
A_1B_1 (24)	-	8.63*	6.97 *	9.75*

A_1B_2 (19.51)	-	-	0.87	2.82*
A_2B_1 (19.88)	-	-	-	3.04*
A_2B_2 (18.36)	-	-	-	-

0.01 level of significance

Table 7 shows that male prospective teachers of aided colleges have more knowledge of computers (M=24) than female prospective teachers of aided colleges (M=19.51). Male prospective teachers of aided colleges are higher on knowledge of computers (M=24) as compared to male prospective teachers of self-financing colleges (M=19.88). Male prospective teachers of aided colleges have more knowledge of computers (M=24) as compared to female prospective teachers of self-financing colleges (M=18.36). Female prospective teachers of aided colleges (M=19.51) and male prospective teachers of self-financing colleges (M=19.88) yield comparable mean scores on knowledge of computers. Female prospective teachers of aided colleges have more knowledge of computers (M=19.51) than female prospective teachers of self-financing colleges (M=18.36). Male prospective teachers of self-financing colleges have more knowledge of computers (M=19.88) as compared to female prospective teachers of self-financing colleges (M=18.36).

Further, male prospective teachers of aided colleges have maximum knowledge of computers (M=24), while female prospective teachers of self-financing colleges have lowest knowledge of computers (M=18.36).

2.4.2 B × C Interaction

The F-value for the double interaction between Gender and Attitude towards computers (B×C) is 46.58 (vide table 3 for df = 1/312), which is significant at 0.01 level, leading to inference that the two variables interact with each other. To investigate further, the interaction between gender and attitude towards computers, the t-ratios were computed. The results for the same have been given in Table 8.

Table 8
Significance of Difference of Mean Scores of Knowledge
of Computers among Different Combination Groups for
Gender × attitude towards Computers

Group (Mean)	B_1C_1 (25)	B_1C_2 (20.52)	B_2C_1 (18.88)	B_2C_2 (17.35)
B_1C_1 (25)	-	11.79*	16.19*	17.98*
B_1C_2 (20.52)	-	-	6.07*	9.52*
B_2C_1 (18.88)	-	-	-	4.6*
B_2C_2 (17.35)	-	-	-	-

0.01 level of significance

Table 8 reveals that male prospective teachers having favourable attitude towards computers have more knowledge of computers (M=25) as compared to male prospective teachers having unfavourable attitude towards computers (M=20.52). Male prospective teachers having favourable attitude towards computers have more knowledge of computers (M=25) as compared to female prospective teachers having favourable attitude towards computers (M=18.88). Male prospective teachers having favourable attitude towards computers have more knowledge of computers (M=25) as compared to female prospective teachers having unfavourable attitude towards computers (M=17.35). Male prospective teachers having unfavourable attitude towards computers have more knowledge of computers (M=20.52) as compared to female prospective teachers having favourable attitude towards computers (M=18.88). Males having unfavourable attitude towards computers (M=20.52) are higher on knowledge of computers than female having unfavourable attitude towards computers (M=17.35). Female prospective teachers having favourable attitude towards computers have more knowledge of computer (M=18.88) as compared to female prospective teachers having unfavourable attitude towards computers (M=17.35).

Further, male prospective teachers having favourable attitude towards computers have maximum knowledge of computers and female prospective teachers having unfavourable attitude towards have minimum knowledge of computers.

2.4.3 A × C Interaction

From Table 3 it is evident that double interaction between Type of college and Attitude towards computers (A × C) is 6.11, which is significant at 0.05 level, leading to inference that the two variables interact with each other. To investigate further, the interaction between types of college and attitude towards computers, the t-ratios were computed. The results for the same have been given in Table 9.

Table 9
Significance of Difference of Mean Scores of Knowledge of Computers among Different Combination Groups for Type of College × Attitude towards Computers

Group (Mean)	A_1C_1 (23.81)	A_1C_2 (19.7)	A_2C_1 (21.71)	A_2C_2 (16.53)
A_1C_1 (23.81)	-	7.75*	4.27*	14.30*
A_1C_2 (19.7)	-	-	5.76*	8.51*
A_2C_1 (21.71)	-	-	-	16.71*
A_2C_2 (16.53)	-	-	-	-

0.01 level of significance

From Table 9, it is evident that prospective teachers of aided colleges having favourable attitude towards computers have more computer knowledge (M=23.81) than prospective teachers of aided colleges having unfavourable attitude towards computers (M=19.7). Prospective teachers of aided colleges having favourable attitude towards computers are higher on knowledge of computers (M=23.81) than prospective teachers of self-financing colleges having favourable attitude towards computers (M=21.71). Prospective teachers of aided colleges having favourable attitude towards computers have more knowledge of computers (M=23.81) than prospective teachers of self-financing colleges having unfavourable attitude towards computers (M=16.53). Prospective teachers of self-financing colleges having favourable attitude towards computers have more knowledge of computers (M=21.71) than prospective teachers of aided colleges having unfavourable attitude towards computers (M=19.7). Prospective teachers of aided colleges having unfavourable attitude towards computers have more knowledge of computers (M=19.7) than

prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 16.53). Prospective teachers of self-financing colleges having favourable attitude towards computers have more knowledge of computers (M = 21.71) than prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 16.53).

Further, prospective teachers of aided colleges having favourable attitude towards computers have maximum scores on knowledge of computers and prospective teachers of self-financing colleges having unfavourable attitude towards have minimum scores on knowledge of computers.

2.4.4 Three Factor Interaction (A × B × C) Effect on Knowledge of Computers

The F-value for the triple interaction between Type of college, Gender and Attitude towards computers is 39.07 which is significant at 0.01, level (vide Table 3), leading to inference that the three variables interact with each other. To investigate further, the interaction between type of college, gender and attitude towards computers, the t-ratios were computed. The results for the same have been given in Table 10.

Table 10
Significance of Difference of Mean Scores of Knowledge of Computers among Different Combination Groups for (Type of College × Gender × Attitude towards Computers)

Group	$A_1B_1C_1$ (27.48)	$A_1B_1C_2$ (20.53)	$A_1B_2C_1$ (20.15)	$A_1B_2C_2$ (18.88)	$A_2B_1C_1$ (22.53)	$A_2B_1C_2$ (17.23)	$A_2B_2C_1$ (20.9)	$A_2B_2C_2$ (15.83)
$A_1B_1C_1$ (27.48)	-	13.75*	19.91*	21.13*	14.42*	23.84*	19.91*	31.15*
$A_1B_1C_2$ (20.53)	-	-	0.73	3.02*	3.99*	5.85*	.72	9*
$A_1B_2C_1$ (20.15)	-	-	-	3.01*	6.60*	6.58*	2**	11.08*
$A_1B_2C_2$ (18.88)	-	-	-	-	9.12*	3.46*	4.87*	7.14*
$A_2B_1C_1$ (22.53)	-	-	-	-	-	12.51*	4.62*	18.27*
$A_2B_1C_2$ (17.23)	-	-	-	-	-	-	8.39*	3.12*
$A_2B_2C_1$ (20.9)	-	-	-	-	-	-	-	13.25*
$A_2B_2C_2$ (15.83)	-	-	-	-	-	-	-	-

Table 10 shows that Male prospective teachers of aided colleges having favourable attitude towards computers (M=27.48) are higher on knowledge of computers as compared to male prospective teachers of aided colleges having unfavourable attitude towards computers (M=20.53). Male prospective teachers of aided colleges having favourable attitude towards computers (M=27.48) have more knowledge of computers as compared to female prospective teachers of aided colleges having favourable attitude towards computers (M=20.15). Male prospective teachers of aided colleges having favourable attitude towards computers (M=27.48) are higher on knowledge of computers as compared to female prospective teachers of self-financing colleges having unfavourable attitude towards computers (M=18.88). Male prospective teachers of aided colleges having favourable attitude towards computers (M=27.48) are higher on knowledge of computers as compared to male prospective teachers of self-financing colleges having favourable attitude towards computers (M=17.23). Male prospective teachers of aided colleges having favourable attitude towards computers (M=27.48) have more knowledge of computers as compared to male prospective teachers of self-financing colleges having unfavourable attitude towards computers (M=17.23). Male prospective teachers of aided colleges having favourable attitude towards computers (M=27.48) are higher on knowledge of computers as compared to female prospective teachers of self-financing colleges having favourable attitude towards computers (M=20.9). Male prospective teachers of aided colleges having favourable attitude towards computers (M=27.48) are higher on scores of knowledge of computers as compared to female prospective teachers of self-financing colleges having unfavourable attitude towards computers (M=15.83). Male prospective teachers of aided colleges having unfavourable attitude towards computers (M=20.53) and female prospective teachers of aided colleges having unfavourable attitude towards computers (M=20.15) yield comparable mean scores on knowledge of computers. Male prospective teachers of aided colleges having unfavourable attitude towards computers (M=20.53) are higher on scores of knowledge of computers as compared to female prospective teachers of aided colleges having unfavourable attitude towards computers (M=18.88). Male prospective teachers of self-financing colleges having favourable attitude towards computers (M=22.53) have more knowledge of computers as compared to male prospective teachers of aided colleges having unfavourable attitude towards computers (M=20.53). Male prospective teachers of aided colleges having unfavourable attitude towards computers (M=20.53)

are higher on knowledge of computers as compared to male prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 17.23). Male prospective teachers of aided colleges having unfavourable attitude towards computers (M = 20.53) and female prospective teachers of self-financing colleges having favourable attitude towards computers (M = 20.9) yield comparable mean scores on knowledge of computers. Male prospective teachers of aided colleges having unfavourable attitude towards computers (M = 20.53) are higher on scores of knowledge of computers as compared to female prospective teachers of self-financing colleges having unfavourable attitude towards computers (M =15.83). Female prospective teachers of aided colleges having favourable attitude towards computers (M = 20.15) have more knowledge of computers as compared to female prospective teachers of aided colleges having unfavourable attitude towards computers (M = 18.88). Male prospective teachers of self-financing colleges having favourable attitude towards computers (M = 22.53) are higher on scores of knowledge of computers as compared to female prospective teachers of aided colleges having favourable attitude towards computers (M = 20.15). Female prospective teachers of aided colleges having favourable attitude towards computers (M = 20.15) are higher on knowledge of computers as compared to male prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 17.23). Female prospective teachers of self-financing colleges having favourable attitude towards computers (M = 20.9) have more knowledge of computers as compared to female prospective teachers of aided colleges having favourable attitude towards computers (M = 20.15). Female prospective teachers of aided colleges having favourable attitude towards computers (M = 20.15) are higher on knowledge of computers as compared to female prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 15.83). Male prospective teachers of self-financing colleges having favourable attitude towards computers (M = 22.53) are higher on knowledge of computers as compared to female prospective teachers of aided colleges having unfavourable attitude towards computers (M = 18.88). Female prospective teachers of aided colleges having unfavourable attitude towards computers (M = 18.88) are higher on knowledge of computers as compared to male prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 17.23). Female prospective teachers of self-financing colleges having favourable attitude towards computers (M = 20.9) have more knowledge of computers as compared to female prospective teachers of aided

colleges having unfavourable attitude towards computers (M = 18.88). Female prospective teachers of aided colleges having unfavourable attitude towards computers (M = 18.88) are higher on knowledge of computers as compared to female prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 15.83). Male prospective teachers of self-financing colleges having favourable attitude towards computers (M = 22.53) are higher on knowledge of computers as compared to male prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 17.23). Male prospective teachers of self-financing colleges having favourable attitude towards computers (M = 22.53) have more knowledge of computers as compared to female prospective teachers of self-financing colleges having favourable attitude towards computers (M = 20.9). Male prospective teachers of self-financing colleges having favourable attitude towards computers (M = 22.53) are higher on knowledge of computers as compared to female prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 15.83). Female prospective teachers of self-financing colleges having favourable attitude towards computers (M = 20.9) are higher on knowledge of computers as compared to male prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 17.23). Male prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 17.23) have more knowledge of computers as compared to female prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 15.83). Female prospective teachers of self-financing colleges having favourable attitude towards computers (M = 20.9) are higher on knowledge of computers as compared to female prospective teachers of self-financing colleges having unfavourable attitude towards computers (M = 15.83).

Further, male prospective teachers of aided colleges having favourable attitude towards computers have maximum scores on knowledge of computers while female prospective teachers of self-financing colleges having unfavourable attitude towards computers have minimum scores.

Findings

1. There is significant difference in knowledge of computers among prospective teachers with respect to type of college.
2. There is significant difference in knowledge of computers among prospective teachers with respect to gender.

3. There is significant difference in knowledge of computers among prospective teachers with respect to attitude towards computers.
4. There is significant difference in knowledge of computers among prospective teachers with respect to type of college and gender.
5. There is significant difference in knowledge of computers among prospective teachers with respect to gender and attitude towards computers.
6. There is significant difference in knowledge of computers among prospective teachers with respect to type of college and attitude towards computers.
7. There is significant difference in knowledge of computers among prospective teachers with respect to type of college, gender and attitude towards computers.

Discussion

Results of the present study indicate that only 20 per cent of the prospective teachers belong to high level of knowledge of computers. 54 per cent of them belong to moderate level and 26 per cent belong to low level of knowledge of computers. It means they do not know well even the various fundamental aspects of computers and the basic skills involved in the operations of computers. This is a question mark on the quality of education being provided in colleges and schools as prospective teachers would have to prepare their students to achieve success in the outside world.

Another finding of the present study is that knowledge of computers is significantly more in case of prospective teachers of aided colleges in comparison to prospective teachers of self-financing colleges. One of the possible causes for this could be that prospective teachers enrolled in aided colleges have to work harder, struggle more to be there and so they strive to achieve higher levels.

Further, the results also indicate that male prospective teachers have more knowledge of computers as compared to female prospective teachers. The study supports earlier findings that sex significantly affects the knowledge of computers (Baker,1986; Pelgrum and Plomp,2000). Further, these findings are in line with previous study (Palaigeorgiou et al., 2005) where it was observed that male members have more knowledge of computers, e.g. hardware computer, software package and basic principles how to operate software packages and different types of computer components, than the female subjects. However, on the other hand there are studies, which report no significant difference between males and females with regard to knowledge of computers (Al-Badar, 1993; Compton et al., 2003). The

tentative explanation of the present findings maybe put forward in the sense that computer knowledge and its use was thought to be a male domain. But there are also certain other factors which may determine the knowledge of computers among males and females.

Findings of the present study also reveal that prospective teachers having favourable attitude towards computers have more knowledge of computers than the prospective teachers having unfavourable attitude towards computers. That means attitude towards computers may enhance or impede learning process. The results are in consonance with the findings of S.R. and P.V. (2007) who reported significant and positive relationship between the knowledge of computers and the attitude towards computers of the higher secondary school teachers. Simonson et al. (1987) also concluded that the development and maintenance of positive attitude towards computers is crucial for computer literate person.

Regarding interactional effects, the joint effect of factors viz., i) type of college and gender ii) gender and attitude towards computers iii) type of college and attitude towards computers, and iv) type of college, gender and attitude towards computers is found significant on knowledge of computers. This joint effect of various interactions on knowledge of computers may be significant due to the reason that factors like type of college, gender and attitude towards computers exert significant independent contributing effect in determining the scores on knowledge of computers. Another probable reason for significant various interaction effects may be due to the two different ways in which each factor is varying viz., aided and self-financing colleges of education; males and females prospective teachers; and favourable and unfavourable attitude towards computers.

Educational Implications

1. Since development and maintenance of positive attitude towards computers are essential elements for better achievement in knowledge of computers, the negative attitude towards computers might lead to low achievement. So, it is important that attitudes of prospective teachers towards computers have to be influenced positively. For it, the personal experience of people with computers as well as subjective implications of computers for people need to be understood and managed.

2. In colleges of education, painstaking efforts should be made to develop in the prospective teachers the appropriate knowledge of computers and essentials skills in working with them. In this

context, special attention should be given to female prospective teachers and prospective teachers of self-financing colleges.

3. Teacher educators need to incorporate technology into their lesson plans in addition to teaching prospective teachers how to use computers so that it is woven into many curricular activities throughout the week. Some teachers are just not interested in using computer and are not going to change no matter what. It is important to build enough time into the daily schedule allowing teachers enough time to collaborate and to work with their students. Overall, the concern for introducing IT in education is not to develop technocrats but technopedagogs.

4. In teacher education institutions, syllabi followed shows less weightage to IT as far as content and marks are concerned. This aspect should be considered while redesigning the curriculum.

5. Apex agencies namely NCTE and NAAC should see that fast growing self-financing teacher education institutions have the professional feel and appeal.

REFERENCES

AL-BADAR, M. 1993. Predictors of success in self-instructional courses on microcomputer application software. (online) *Dissertation Abstracts International,* 5408A.2991. Abstract from: Ohio link file : Dissertation abstracts international item : AA19005361.

AZIZ, S. 2004. A study of I.C.S. students' knowledge, anxiety and attitude towards computers. *Unpublished Dissertation,* Lahore.

BAKER, J. 1986. Cognitive style, learning style, and aptitude: Predictors of achievement in computer - related courses. (online) *Dissertation Abstracts International,* 4710 A, 3737. Abstract from: Ohio link file : Dissertation abstracts international item : AA18703306.

COMPTON, D. M., BURKETT, W.H. AND BURKETT, G. 2003. No sex difference in perceived competence of computer use among male and female college students in 2002. *Psychological Reports,* 92(2), 503–511.

FISHBEIN,M. AND AJZEN, I. 1975. *Belief, attitude, intention and behaviour: An introduction to theory and research.* Addison-Wesley. Massachusetts.

LOYD,B.H., AND GRESSARD, C. 1985. The reliability and validity of an instrument for the assessment of computer attitudes. *Educational and Psychological Measurement,* 45(4), 903-908.

PALAIGEORGIOU, G.E., SIOZOS, P.D., KONSTANTAKIS, N.I. AND TSOUKALAS, I.A. 2005. A computer attitude scale for computer science freshman and its educational implications. *Journal of Computer Assisted Learning,* 21, 330-342.

PELGRUM, W.J., AND PLOMP, T. 2000. What do student know, learn and think about computers in IEA. Computer First Report Stage 11. http://

www.mscp.edte.untwent.u//sitems/extern/comped/fr2/chap4.htm., Retrieved October, 2008.

REECE, M.T. AND GABLE, R.K. 1982. The development and variation of a measure of general attitude towards computers. *Educational and Psychological Measurement,* 42(37), 913-916.

SIMONSON, M., MAURER, M., MONTAG, T.M., AND WHITAKER, M. 1987. Development of a standardized test of computer literacy and a computer anxiety index. *Journal of Educational Computer Research,* 3(2), 231-247.

RAJASEKAR,S. AND P.,VAIYAPURI RAJA. 2007. Higher secondary school teachers' computer knowledge and their attitude towards computers. *Journal of All India Association for Educational Research,* 19(1and2), 70-74.

TIPTON, M. 1991. The effect of ability, age, attitude and gender on students' achievement in the junior high computer literacy class. (online) *Dissertation Abstracts International,* 30-04A, 1016. Abstract from: Ohio link file: Dissertation abstracts international item : AA11347809.