

The Attitude of Teacher trainees towards the Teaching of Computer Education at B.Ed Level

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ABSTRACT

Tremendous changes are taking place in the world which certainly influence the system of education. So the teacher education too can not remain immune to these global changes. Information Technology (IT) is affecting us as teachers, as individuals and as a society. Digital learning has opened the doors of classroom and made knowledge accessible even for those sitting at home. The preparation of teacher has changed with the passage of time and with the change in expectations of the society. Teachers have always played a crucial role in preparing communities and societies towards exploring new horizons and achieving higher level of progress and development. The teacher educators occupy a pivotal position in the system of education. The success of any educational reform depends upon the quality of teachers and in turn the quality of teachers depends to a large extent on the quality of teacher education.

In view of the fact the computer education paper was introduced by the state of Andhra Pradesh (INDIA) as a compulsory paper in the common core curriculum for B.Ed course, for all the secondary teacher-training institutions in the state. The present researcher conducted a survey with a designed questionnaire to assess the computer usage and computer literacy and the attitude of teacher trainees towards the teaching computer education. The sample of 200 B.Ed. students from Government and Private Colleges of Education, comprises male and female, were included from the Kakatiya University region.

The present study has revealed that 80% of the computers in the college are in working condition but only 10% of them have access to Internet. The usage of computers (hours per week) by the teacher trainees were 1-2 hours (61%), 3-4 hours (32%) and 5-7 hours (7%). In the case of Internet, the trainees use per week 1-2 hours (22%) and 3-4 hours (8%). Only 10% of the teacher educators are qualified to teach computer education paper, the rest (90%) are computer operators / assistants. 70% of the students are relying on college computers and only 10% of the students are having computer at home. Majority of the trainees (86%) have expressed that computer syllabus is sufficient and computer projects given by the teachers are appropriate (70%). The projects of computers have developed interaction among the trainees, encouraging collaborative work/teamwork and learning by doing.

The major barriers identified by the trainees during the course were inexperienced computer faculty, inadequate computer systems, non-availability of Internet facilities and essential software. The allocated time for practicals and Internet was insufficient. Majority of the trainees (97%) agreed that the introduction of computer paper at B.Ed. level was necessary and their level of satisfaction was 80%. The students realised the importance of teaching computer education and its various topics were appropriate at B.Ed level. They were confident of using the computer for their classroom teaching and ready to integrating the computer knowledge in their teaching. Some suggestions were also made by the trainees to make the computer paper more appropriate in teacher education.

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Introduction

The world is changing so fast that past "truths" often mislead instead of providing help. No longer is it easy to apply past truths to the problems of the present and the future. Today's world "calls for new approaches to experience, both in acquiring it and in using what we already have" (Stevens, 1963, p. 56). Modern society is characterised by rapid change and technological advance. Perhaps never in the history of mankind have so many changes occurred simultaneously and with such acceleration over so broad a spectrum of man's affairs. Changes witnessed during the recent past are seen to represent an even greater acceleration compared to those of previous decades (Raina, 1989, p.43).

Mitchell (1993), explains the major global changes which will continue into the 21st century. He describes the "accelerating rate of change on a global scale", pointing to the rate of change of human invention, the speed of generation of new knowledge, human population growth and the evolution and speed of human transportation (see the graphical pictures in Fryer, 1996, p.6-7, fig.1.1 and 1.2). He argues that the explosion of new knowledge is now so great that most of the things that young children are currently learning will be obsolete by the time they grow up. We have never been in this situation before.

In this view of the future, traditional responses to the demand for education that are essentially quantitative and knowledge-based are no longer appropriate. It is not enough to supply each child early in life with a store of knowledge to be drawn on from then on. Each individual must be equipped to seize learning opportunities throughout life, both to broaden her or his knowledge, skills and attitudes, and to adapt to a changing, complex and inter-dependent world (UNESCO, 1996, p.85).

Toffler (1981) was interested in studying the effects of the social and cultural changes on various psychological, sociological and educational aspects. He explained the rapidly changing world as a sequence of "three waves" of civilization. The first wave related to the invention of *agriculture*. The second wave was the *Industrial revolution* and the third wave is the emergence of "the *electronic age, /electronic cottages/ the electronic world*". This third wave has affected the whole world; particularly the emergence of computers has penetrated everyone's life to a remarkable degree.

In this era of emerging technologies, the role of the teacher is more than that of a facilitator or guide. A more productive role will be that of co-learner-an expert guide who helps

students navigate the subjects being explored. Students need a learner facilitator to give and explain the wealth of information available online. Teachers are becoming more like facilitators or learning coaches, leaving students free to discover knowledge on their own i.e, learning by discovery and experimental learning (UNESCO,1998, p.94) .

The teacher educators should recognise the importance of the computer education and train teacher trainees to develop positive attitude and encourage a partnership with electronic education. These electronic shifts in education pose numerous challenges for the educator. In this context, teacher education curriculum should be restructured so as to meet these new challenges.

Use of computers in Education

Computer is a device that computes, especially a programmable electronic machine that performs high-speed mathematical or logical operations or that assembles, stores, correlates, or otherwise processes information. Computers perform many of the routine activities in today's society. Computers have entered all walks of human life across the world. They are being used in various fields including education. Computers were introduced into this field to make the Teaching Learning Process (TLP) easier and more effective. Instructional material can be prepared and stored within the computer in the form of programmes, which are carefully structured to teach specific lessons.

The computer can ease the load of administrative duties, leaving the teacher more time to concentrate on teaching. For example, the computer can be used to assist in building timetable; to monitor and schedule teaching resources; to build up and maintain comprehensive student records in order to provide a complete student profile; and to accumulate information for assistance with career guidance (Hunt and Shelley, 1989).

Computer is evolving into a tool to facilitate learning most of the educational properties of older technologies (books, radio, film strips, phonograph records, television) with at least equal if not greater convenience of use plus communication capabilities in addition (UNESCO, 1998, p.82). The UNESCO has identified 15 special properties of computers which enhance student learning processes on a number of orthogonal dimensions (p.89).

Use of Internet and e-mail in Education

The Internet is an international network connecting a large number of smaller networks that link computers at academic, scientific, governmental and non-governmental and commercial institutions. The best known part of Internet is the WWW (World Wide Web) which stores information in multimedia form – sounds, photos, videos, as well as text etc.,

The Internet is a giant network of computers located all over the world that communicate with each other. At various stops on the highway, there are “sights”- similarly, at various places on the Internet, there are repositories of software and other information that you can download for free. This is called *file transfer* (Fisher, 1993).

The use of the Internet deserves special mention here. It is the newest and in the world of educational computing, it is being promoted by many as the most powerful tool for learning ever invented. What makes it so powerful is that it allows the child or young person to freely search for educational material or useful information, as well as doing communication with all sorts of people in different parts of the planet.

The resources on the net are so large that even a well-established traditional library can not match the Internet. The latest books or information is available on the Internet and this can be accessed from anywhere in the world. Trainees, teacher educators, researchers and anybody can use it for that matter. “Knowledge webs” give people distributed access to experts, archival resources, authentic environments and shared investigations. Via information infrastructures, educators, and students can join distributed conferences that provide an instant network of contacts with useful skills (Sheela, 2005).

Electronic mail (e-mail) is the most commonly used service of the Internet. E-mail facilitates communication with people all over the world. It has made the geographical boundaries of nations shrink, as one can send mail to anyone connected to Internet wherever he/she is almost instantaneously. E-mail is mostly used for sending and receiving messages, scanned letters, text and image files, mails as attachments for the download, which reduces the postal delays and save time.

Survey Studies on the use of Computer and Internet and e-mails

Survey of literature regarding the computers, Rajasekar (2002) has studied that a large number of teachers have favourable attitude towards computers. In the subsequent study,

Rajasekar (2003) has investigated that, B.Ed. students have a favourable attitude towards computer more in the urban areas than in the rural areas.

According to NCES (2003) survey with 26,002 sample to examine the use of computers and the Internet by American children and adolescents between the age 5 and 17, about 90% of them use computers and about 59% use the Internet, usage of computer at school and home were 81% and 65% respectively. Although nearly all schools have Internet access they are more likely to access the Internet from their homes (78%) than schools (68%), the house is the most widely used internet access location, the group of children and the adolescents who access the internet at school are from poor families (52%), and their parents have not completed high school.

Intel Canada's "Teens, Education and Computer Use at Home survey 2002" was conducted by Ipsos-NPD Canada Inc. during the period July 23-August 1, 2002. 427 online surveys were completed with parents and their teen, ages 12-17 years, from across Canada. The results show that a computer with Internet access has become an invaluable homework-helping resource for Canadian kids. Teens with Internet access are now spending over half (57%) of their total homework time on the computer gathering information for school assignments and writing reports and papers. Although 76% of Canadian kids surveyed have to share a computer with others in the household, once they get online, Google, Yahoo and MSN are teens' preferred search engines, with Encarta, National Geographic, dictionary.com and NASA being favourite homework-helping web-sites. And while male teens are significantly more likely to have their own PC (29% compared with 20% for girls), girls still spend more time on their homework and more hours per week using the computer for homework assignments (Ralph Bond,2002).

Becker, Wong and Ravitz (1999), Teaching, Learning, and Computing (TLC- 1998) National Survey measured several aspects of computer use. Like teachers in other groups of schools, Co-NECT teachers had students use word processing more than any other type of software; in fact, their use of word processing was not substantially greater than teachers' use of that type of software in other school settings. However, Co-NECT teachers had students use five types of software substantially more than other teachers: spreadsheet/database software, the World Wide Web, presentation software, electronic mail, and multimedia authoring. They were more likely than other teachers to report "learning to work collaboratively" as an objective for their students' computer use (53% vs. about 25% nationally).

US Census Bureau (2000) reported on the bases of Current Population Survey (CPS) that more home Internet users, both Adults (above 18 years) and Children (below 18 years) sent or

received e-mail in 2000. They used this more than any other did on line activity. Among the children, 73% used e-mail and 68% used for research for school or to take course online. In the case of adults, 88 % used e-mail and 64% used for Information searches.

Sarsani and Laxma Reddy (2005) conducted a survey with a sample of 168, from the B.Ed colleges. It was found that the colleges did not have adequate resources. Where there were resources, they were not used optimally for various reasons. In majority cases, adequate number of computers were not provided. There was no Internet facility and the required software is not available. The instructional support was not adequate and experts were not invited to deliver lectures.

The majority of studies in India are related to computer and its applications in various fields but none of them has addressed the attitude of the teacher trainees towards the teaching of computers at B.Ed. level, particularly in the state of Andhra Pradesh. Hence, there is a need to explore the views of teacher trainees with regard introduction and teaching of computer education and its applications in teaching learning process.

Need and importance of computer education in Teacher Education

It is a known fact that no field is untouched by computers. Unless one has the ability to make use of computers in the respective fields, he/she is considered to be an illiterate, even though he/she is educated. He / she is known as an educated illiterate in the modern era. A computer literate is a person having a basic understanding of the computers and is able to use it for his own benefit.

The awareness of computer literacy among the students, teachers and parents is needed. Computer education has assumed immense significance in the education system of the country. Strengthening the pre-service teachers' content of knowledge as well as presenting the content in a way which helps them to discover how to turn the power of computer technology into teaching tools that captivate students, motivate them and ultimately move them towards greater learning.

Hence, computer education should form an integral part of the teacher education programme. Even though integration of computer education into the teacher education curriculum has started already it has not been implemented effectively in all the teacher education colleges. Hence, the present study attempts to assess the computer usage among teacher trainees, their computer literacy.

The findings of this research will be helpful not only to teacher educators, but also educational administrators and planners, and parents as well. The findings may be useful in suggesting desirable changes in teacher education curriculum, to develop positive attitudes among the teacher trainees, and suggest remedies for the present problems.

Introduction of Computer Education paper at B.Ed level

In India, Intel teach to the future was launched on 28th February 2000. It is a world-wide effort to help both in-service teachers and pre-service teachers integrate technology into the classroom. The programme enables pre-service teacher educators and teacher trainees to discover how to create technology enhanced units in collaborative teams and develop tools that motivate students and help them become self-directed learners. They will understand how to use powerful productivity software, multimedia tools, and the Internet to promote inquiry-based learning.

Teacher educators are provided with training and resources for use in their pre-service courses. Teacher trainees work in teams as they use technology to tap into vast reservoirs of information from the Internet and digital sources, and develop lesson plans that meet challenging standards while promoting critical thinking and helping students grow and succeed with the speed of technology. Strengthening the pre-service teachers' content knowledge as well as presenting the content in a way which helps them discover how to turn the power of computer technology into teaching tools to captivate students, motivate them, and ultimately move them towards greater learning (Intel, 2002, 2003).

Before 2001, the basic computer concepts such as peripherals / elements of computer, flow charts, loops, use of computers in education were included as one of the topics in the Educational Technology paper in the majority of the Universities syllabus. Apart from these topics, few universities included G.W. Basic and C-languages. Neither was practical work carried out by the teacher trainees seriously nor were qualified teachers appointed to teach computer concepts.

The curriculum makers and experts introduced the Educational Technology and Computer Education (50:50) at B.Ed. level in the year of 2002, keeping in view the above factors. The Andhra Pradesh State Council for Higher Education (APSCHE), Hyderabad has conducted seminars and meetings with experts from University departments, Colleges of Teacher Education and SCERT. They resolved that there was a need to introduce Computer

Education paper at B.Ed. level to over the competitive skills. The objectives of the theory component were:

- i) to acquire knowledge of the fundamentals of computers and operating systems,
- ii) to acquire necessary skills of handling Microsoft Office packages for the purpose of education in the institutions of learning,
- iii) to get familiar with new Internet technologies and their place in the field of education.

As far as the practical component is concerned the following objectives were formulated:

- i) to acquire various skills of handling the computer systems
- ii) to acquire knowledge of system software and its usage
- iii) to learn the uses of application software in the field of education
- iv) to generate new ideas for exploration and in-depth study through the project work
- v) to plan, execute and evaluate the project processes
- vi) to use multiples multimedia tools for making teaching learning processes effective
- vii) to learn how to use computers and software for the purpose of educational administration
- viii) to integrate new technologies with teaching learning processes
- ix) to work in groups to achieve the targets and showcase the performance

The main contents in computer education paper are the concepts of computers, operating systems, introduction to MS-Office- Word, Excel, Access, PowerPoint, Internet and e-mail, and use of MS-Publisher. In the projects / Practical work, creating documents, multimedia presentations, publications and WEB sites; using spreadsheets and databases are included.

As far as the computer training / orientations to the teacher educators working in colleges of education under the jurisdictional of Kakatiya University, Warangal (AP) India was concerned, the University and Intel Microprocessor Manufacturing Company conducted 3 and 2 programmes respectively.

The present study is to be carried out to assess the utilisation of computers as an instructional aid, as tool, tutor, and tutee.

Methodology

The questionnaire focussed on the students' background and their usage of computer and access to Internet and e-mail for their project work of computer education and other projects' work. It aimed at knowing the students' views on different topics of computer education. Furthermore, the study analyses the technical difficulties, expectations and suggestions for further development of the computer education paper. The researcher chose to construct a questionnaire including mainly fixed answers to tick. It is easy to mark answer but it does not

reveal deep insights of the respondents. To avoid such problems the option of 'other (specify)' was included to write their opinion freely. Some of the open-ended questions were also included. To establish the reliability and validity of the instrument various methods were applied. To establish the reliability and validity of the questionnaire were established by monitoring the clarity of directions and the wording of questions. The questionnaire contains of 18 items with both fixed and open-ended form items. The items are concerned with the following objectives:

1. To find availability of equipment and software at the college.
2. To find the place of working on computer and the project work of trainees.
3. To know the attitude towards the introduction of computer at B.Ed. level.
4. To establish the relevance of the B.Ed. Syllabus to the teacher education.
5. To know how far the projects are useful for trainees and to find out whether they would continue the experience in teaching (in future teaching).
6. To find out the barriers in the colleges in regard to the computer education paper.
7. To find the usage of computer and internet and their applications for the course work.
8. To explore the support expected by the teacher trainees to be fulfilled by the college during the course and reasons for not fulfilled their exceptions.

Sample:

The researcher selected a sample of 200 B.Ed students from the five B.Ed. colleges in Warangal district from each college 40 students were selected through random sampling techniques. The sample comprises 120 male and 80 female teacher trainees.

Data collection Procedure:

The researcher visited the colleges personally and gave the questionnaire by hand to the students in the college. The questionnaires were collected after the students marked their opinion for every item in the questionnaire.

Statistics used for the study:

The data was tabulated carefully and item-wise analysis was done using simple percentages because most of the items are multiple responses and open-ended type. The Chi-square (χ^2) test of equal probability was applied wherever necessary.

Results of the study:

The analysis was carried out on the basis of objectives of the study by employing appropriate statistical techniques. In each table the items were arranged in descending order and

not in the order followed in the questionnaire for clarity. Later the results were interpreted and conclusions were drawn.

Availability of Computers and access to the Internet at College and Home or Internet Centre for the teacher trainees

The responses given by the teacher trainees with regard to the availability of resources at college and home or Internet centre for the use of computer and Internet are presented in the table-1.

Table – 1: Availability of computers and access to Internet at college and home for the teacher trainees

S.No.	Particulars				%
1	A) Availability of computers at College				10 PCs**
	i) Working conditions				80%
	ii) Not working				20%
	B) Availability of Internet facilities at College				
	iii) Connected to Internet				10%
2	Availability of computers for students teachers at Home				10%
3	A) Use of Computers (hours per week)				Total
	i) College only				70%
	ii) College & Internet centre				20%
	iii) College & Home				10%
	B) Use of Internet (hours per week)				
	i) College only				10%
	ii) College & Internet centre				20%
	iii) College & Home				-
4	Computer faculty				
	i) Teacher Educators (with computer degrees)				10%
	ii) Computer Lectures / Computer Assistants (with computer degrees)				90%

** 10 Personal Computers in every College as directed by National Council for Teacher Education (NCTE) norms India.

The data reveals that every college has 10 computers, reason could be the condition stipulated by the National Council for Teacher Education (NCTE) that a college should have at least 10 computers for 100 students (i.e., 1:10). But 8 computers (80%) are in working condition

for every 10 computers in the colleges. Only one college (only 10%) is able to provide Internet facility for every 10 colleges under the Kakatiya university jurisdictional area.

The same table-1 shows that only 10% of students are having computers at their homes. It is also observed that 70% of the trainees are using computers at college only. The remaining trainees are using the computer at college and Internet centre; and college and home were 20% and 10% respectively. A 61% of trainees are working only 1-2 hours per week, and 32 percent are working 3-4 hours per week. Only 7 % of the trainees are working between 5-7 hours per week.

Regarding the usage of Internet, only 10 % of the trainees are using Internet at college and 20% of trainees are using at college and Internet centre. None of them are using Internet at college & home. As far as teaching faculty is concerned, only 10% of the teacher educators (having MA/MSc with M.Ed) are teaching the computer education paper remaining 90% are computer lecturers/computer assistants without teaching degrees.

Usage of Computers and access to Internet by the teacher trainees

The teacher trainees were asked about the use of computers and purpose of access to Internet benefits. The table-2 shows that, 82% of trainees are using computer applications such as word processor (MS-Word) and spreadsheet (MS-Excel) etc.,. Beside these data processing / problem solving (57%), Computer games and Audio / Video songs (57%) and to teach difficult topics in all subjects as teaching aid (50%). In addition, Graphical presentation of materials / demonstration of experiments; correspond with expert, authors, students from other schools, etc, via e-mail or Internet; and produce multimedia reports / projects are 39% each. Teacher trainees have also mentioned a few other uses of computers such as drill (or) practice (36%), drawing and painting (36%). A few of trainees (14%) expressed that computer could be used for demonstrations / simulations / stimulation / motivation.

Table – 2: The usage of computers by the teacher trainees for different purposes

S.No	I mostly use the computer for the following purposes	%
1.	Use of computer applications such as word processing (Word) spreadsheets (Excel) etc.	82
2.	For data processing / problem solving	57
3.	For computer games / Audio or Video songs	57
4.	To teach difficult topics in all subjects as teaching aid	50
5.	For graphical presentation of materials / demonstration of experiments	39
6.	To correspond with experts, authors, students from other schools, etc., via e-mail or Internet	39
7.	To produce multimedia Reports / Projects	39
8.	For drill (or) practice	36
9.	For drawing and painting	36
10.	For demonstrations / Simulation / Stimulation / Motivation	14

Table – 3: Access to the Internet by the teacher trainees for different purposes

S. No.	I mostly access to the Internet for the following purpose	%
1	To downloaded model lesson plans / Gathers information for planning lessons	50
2	For multimedia presentations for the classroom	32
3	For searching for computer project information or other project records of B.Ed.	32
4	To download Examination Results / Hall Tickets	21
5	For attended online Counselling	18
6	For chatting	18
7	To download instructional materials (i.e., handouts, tests, etc.)	14
8	For e-mail communication with classmates / other students / teachers	14
9	To download music / songs	11
10	To download the applications of admissions / Jobs	7
11	To download computer games	7
12	To download educational and other free software	7
13	To create / maintain own web site	4
14	To access research and best practices for teaching	4
15	To explore new knowledge / to know the latest developments on the globe	4
16	To download news and information	4

The responses given by the trainees towards the purpose of access to the Internet are presented in the table-3. Mostly the trainees used Internet for down loading model lesson plans / gather information for planning lessons (50%), multimedia presentations for the classroom (32%) and searching for computer project information or other project records of B.Ed (32%).

The trainees also used Internet to download exams results / hall tickets (21%), attended online counselling (18%), chatting (18%), downloaded instructional materials (ie-handouts, tests, etc) (14%), E-mail communicate with classmates / other students / teachers (14%), and download music / songs (11%). Very few of trainees (7% each) were downloaded application of admissions / jobs; computer games and educational and other free software. Only 4% of each were able to create / maintain own web-site, access research and best practice for teaching, to explore new knowledge / to know the latest developments on the globe and down load news and information.

Teacher trainees attitude towards the introduction of computer education and its relevance to the teacher education

From the table-4, it is quite clear that the majority of teacher trainees (97%) agreed that the introduction of computer education paper at B.Ed level was necessary. The χ^2 value 47.3 shows significant at 0.001 level.

Table-4: Teacher trainees' attitude towards the introduction of computer education paper in B.Ed course

S.No	Do you think that the introduction of computer education is necessary?	Yes – 97 % No – 03 % $\chi^2 = 47.3^{***}$
The reasons given by the teacher trainees for necessity of introduction of Computer education		%
1	As teaching aid to teach difficult topics	31
2	For effective teaching by using multimedia	28
3	Acquire new knowledge for competitive world	24
4	Data management – Students particulars/marks etc.,	10
5	Due to the Technology development/computer world	10
6	For the development of Nation	3.5
7	Preparation of Lesson plans / Teaching material	3.5

*** Significant at 0.001 level

They gave the reasons for introduction of computer that computers could be used as a teaching aid to teach difficult topics (31%), for effective teaching by using multimedia (28%), and acquire new knowledge for competitive world (24%). Responses which indicated the technology development / computer world and Data management – student particulars / marks etc., were 10% each. A very small percentage of them expressed that computer education helps the development of nation (3.5%) and preparation of lesson plans / teaching material (3.5%).

Only 3% teacher trainees said that computer education was not necessary because we could not use computers in our daily life and at school.

The table-5 shows that majority of the teacher trainees indicated that computer syllabus was sufficient (86%) and only 14% said that the syllabus was insufficient (14%). The χ^2 value 51.8 shows significant at 0.001 level. The computer projects given by the teachers in B.Ed course were more appropriate (70%) but 30% of them complained that the projects were not appropriate. The χ^2 -value (16.0) shows significant at 0.001 level. Regarding the contents included in the computer education paper majority of trainees (94%) expressed that contents were more relevant to teaching learning process. Only 6% of the teacher trainees said that the contents were not relevant. The trend of opinion was highly significant ($\chi^2 = 77.4$).

The teacher trainees were asked to write their priorities of the relevant topics, the results showed in the table-5 that MS-Word (86%) and MS-PowerPoint (86%) were placed first, MS-Excel (82%) was second; and MS-Access (14%) and MS-Publisher (4%) were placed third and fourth respectively.

Table-5: Teacher trainees' opinion towards the computer education syllabus and relevance to teaching learning process

S.No.	Students opinion	Response	%
1	Computer syllabus	Sufficient Insufficient $\chi^2 = 51.8^{***}$	86 14
2	Computer projects given by computer lecturers	Appropriate Inappropriate $\chi^2 = 16.0^{***}$	70 30
S.No.	Do you think that the contents included in the computer education paper are relevant to teaching learning process?	Yes No $\chi^2 = 77.4^{***}$	– 94 – 06
The topics which are more relevant			%
1	MS- Word		86
2	MS- Power Point		86
3	MS- Excel		82
4	MS- Access		14
5	MS- Publisher		4

*** Significant at 0.001 level

The table-6 shows that 56% of the teacher trainees expressed that time allocated for computer education was enough but 44% of the teacher trainees said that the time allocated was not enough. The Chi-square value 1.44, which is not significant even at 0.05 level. They

suggested that to reduce the syllabus in practicals (43%), practicals should be started from the beginning (35%), to reduce syllabus in theory (11%), and to reduce the project work (11%).

Table-6: Students opinion towards the time allocation for completion of computer education paper syllabus

S.No.	Do you think that the time allocated for computer education paper is enough to complete the syllabus?	Yes – 56 % No – 44 % $\chi^2 = 1.44^{\#}$
If No, what suggestions would you make		%
1	To reduce the syllabus in practicals	43
2	Practicals should be started from the beginning	35
3	To reduce the syllabus in theory	11
4	To reduce the project work	11

Not significant

The table-7 reveals that the project work of computer education paper is useful for the teacher trainees to improve student interaction / team work / collaboration of work (71%); learning by doing (71%); to share information / ideas/ resources with students and teachers (68%); purpose and use of software of MS-office (68%); and confidence in using computers and preparing seminar presentation etc., (64%). The project work is helpful to acquired computer skills (57%), to develop lesson plans and learning materials (54%) and fill up the gaps between theoretical concept and practical work (32%).

Table 7: The use of project work of computer education for teacher trainees

S.No	How far the Project work of Computer Education is useful for the teacher trainees?	%
1	To improve student interaction / team work / collaboration of work	71
2	Learning by doing	71
3	To share information / ideas / resources with students and teachers	68
4	Purpose and use of software packages of MS-Office	68
5	Confidence in using computers and preparing seminar presentations etc	64
6	Acquired computer skills	57
7	To develop lesson plans and learning materials	54
8	Fill up the gaps between theoretical concepts and practical work	32

Table-8 demonstrates a highly significant trend of opinion ($\chi^2 = 124.8$), 86% of the teacher trainees said that if computer facilities were available they would use computer for their teaching (in future teaching) based on their experience gained in the B.Ed. course. A very small

percentage of teacher trainees (7%) expressed that they used computers to some extent and 7% were not sure / doubtful.

Table-8: The teacher trainees' opinion on use of computer in their future teaching

S.No	If computer facilities are available, would you like to continue to use computers in your teaching (/ in future teaching) based on your experience gained at B.Ed level?	Response	%
1			Definite
		Some extent	- 7
		I am not sure / doubtful	- 7
		$\chi^2 = 124.8^{***}$	

*** Significant at 0.001 level

The teacher trainees were asked to identify from the list of possible barriers in using computers and Internet facilities in their colleges. The responses given by them are presented in the table-9. The major barriers found by the trainees were inexperienced computer faculty (82%), non availability of Internet facility in computer lab (79%), lack of time to learn / practice / plan ways to use computers or the internet (75%), and lack of good instructional software (71%).

Table-9: The barriers identified by the teacher trainees in using computers and Internet facilities in their colleges

S.No	Barriers identified by the teacher trainees in using computers and internet facilities in their colleges	%
1	Inexperienced computer faculty	82
2	No internet facility in the laboratory	79
3	Lack of release time for teachers to learn / practice / plan ways to use computers or the Internet	75
4	Lack of good instructional software	71
5	Not enough computers	68
6	Outdated, incompatible, or unreliable computers	68
7	Lack of time in schedule for students to use computers in the computer lab	68
8	Inadequate training opportunities	64
9	Lack of administrative support	61
10	Lack of technical support or advice	61

They also found barriers (table-9) such as outdated, incompatible or unreliable computers; inadequate computers; and lack of time scheduled for students to use computers in the computer lab were 68% each. Some more barriers experienced by the teacher trainees were inadequate training opportunities (64%), lack of administrative support (61%) and lack of technical support or advice (61%).

The teacher trainees were asked to write the support expected during the B.Ed course for computer education. The responses for support expected and the expectations that were not fulfilled during the course were analysed and presented in the table-10. The trainees expectations mainly were: daily practicals/ sufficient time for practicals (39%), facilities in computer lab / sufficient computers / essential software (25%); and Internet facilities and competent teaching faculty were 18% each. In regard to the expectations which were not fulfilled during the course were insufficient time for practicals (50%), lack of competent teaching faculty (29%) lack of systems to do practicals (25%) and no Internet access (21%).

Table-10: The support expected by the teacher trainees for the computer education paper

S.No	The support expected by the students for the computer education paper.	%
1	Daily practicals / sufficient time for practicals	39
2	Facilities in computer lab / sufficient computers / essential software	25
3	Internet facilities	18
4	Competent teaching faculty	18
S.No	The expectations which are not fulfilled by the students the computer education paper.	%
1	Insufficient time for practicals	50
2	Lack of competent teaching faculty	29
3	Lack of systems to do practicals	25
4	No Internet access	21

The table-11 presents that the teacher trainees agreement is highly significant at 0.001 level ($\chi^2 = 84.7$). For the purpose of analysis, the responses, fully satisfied (30%) and satisfied (50%) were combined as a measure of agreement. So that a total of 80% teacher trainees expressed their satisfaction, though 17% of teacher trainees expressed satisfied to some extent. A small percentage of trainees said that they were not satisfied (2%) and not at all satisfied (1%).

Table-11: The level of satisfaction of teacher trainees towards the introduction of the computer education paper

S.No.		Response	%
1.	To what extent you have satisfied with computer education paper introduced at your B.Ed level?	A. Fully satisfied	30
		B. Satisfied	50
		C. Satisfied to some extent	17
		D. Not satisfied	2
		E. Not at all satisfied	1
		$\chi^2 = 84.7^{***}$	

Suggestions to make computer education paper more appropriate in teacher education

The teacher trainees were asked to give suggestions to make the computer education paper more appropriate in teacher education. The suggestions have been summarised and presented in the table – 12 with percentages. Majority of the teacher trainees (72%) suggested the increase of the number of computers from 10 to 25 (1:10 to 1:4); and 70 % of trainees suggested the increase of lab facilities (eg. Internet software, uninterrupted power supply), a moderate percentage of trainees (57%) suggested the allocation of more time in the computer lab and 50% asked for appointment of experienced teaching faculty.

Table-12: Suggestions made by the teacher trainees to make the computer education paper more appropriate in teacher education

S.No	Suggestions made by students teachers to make the computer education paper more appropriate in teacher education	%
1	Increase number of computers from 10 to 25. (1:10 to 1:4)	72
2	To increase Lab facilities (internet, software, uninterrupted power supply)	70
3	Allocation of more time in the computer lab	57
4	Appointment of experienced teaching faculty	50
5	To appoint lab assistant / instructor	14
6	Replace the Ms-Dos from the syllabus	11
7	Inclusion of the web page designing programmes in the syllabus	7
8	Model Lessons with multimedia presentations must be prepared for the students teachers	7
9	Separate the Computer Education paper from Educational technology and Introduce as a separate paper.	7
10	Installation of virus Programmes	3
11	Seminar presentations by the trainees with multimedia.	3

The same table-12 reveals that 14% of trainees suggested the appointment of Lab Assistant / Instructor and 11% of trainees suggested that the MS-DOS be deleted from the syllabus. A small percentage of trainees suggested the inclusion of the web page designing, model lessons with multimedia presentations and introduction of computer paper as separate paper were 7% each. A very low percentage (3%) for each suggested that installation various programmes and seminars presentations by trainees with multimedia.

Conclusions and discussion:

The majority of the teacher trainees reported that 80% of the computers were in working conditions in the colleges. Now the ratio of computers and trainees increased from 1:10 to 1:12.5 causing the main barrier to the teacher trainees in doing their practicals and completing project work within the stipulated time. In this regard the trainees suggested, 25 computers could be provided in every college (1:4) to overcome the problem.

The majority of trainees (70%) are relying on the college computers and they do not have computers at home. The US-NCES (2003), US- Census Bureau (2000) and Intel Canada's studies revealed that almost all schools had computers and internet facilities; though the children were making use of home computers for their home work assignments. In some cases, the children were using Internet more at home than at school. Unfortunately, in India not only school children but also the teacher trainees were deprived of the facilities.

The time given for practicals in the laboratory and access to Internet were not sufficient to the trainees, the results indicated that the computers were not enough. There was lack of software and also Internet facilities in the colleges. These results are similar to the Sarsani and Laxma Reddy (2005).

The 90% of the faculty teaching computers do not have teaching degrees (B.Ed, or M.Ed) they may not be able to fulfil the curriculum demands of teacher education, as trainees reported that the teaching faculty was not competent enough. All the above problems were also reflected in the unfulfilled expectations of trainees and barriers identified by the trainees in colleges.

The results indicate that the introduction of computer education in teacher education is most necessary and the contents are more relevant to the teaching learning process. The level of satisfaction towards the introduction of computer education is very high. The trainees are confident of using computers and internet facilities mostly for teaching learning process, the projects help collaboration, learning by doing and purpose and use of software packages of MS-Office. In the MS-Office package teacher trains are mostly using MS-Word, MS-Power Point and MS-Excel. Similar results were found in Becker, Wong and Ravitz (1999), the Co-NECT teachers use the software such as word processors and spreadsheet / database software, the World Wide Web, presentation software, electronic mail, and multimedia authoring. The teacher trainees were unable to use WWW, e-mail and multimedia due to the lack of facilities at

colleges as well at homes. If the facilities are available the teacher trainees readily use computers in their teaching. In view of the above observations it is suggested that:

1. Every computer system in the college should be connected to Internet to download the information pertaining to student trainees course work.
2. The number of systems must be raised from 10 to 25 and practicals must be conducted daily in two batches, one in the morning (before commencement of theory classes) and another one in afternoon (after completion of theory classes). 100 trainees can be divided into two batches (50each) and as per the university norms two trainees have to carryout their project work collaboratively occupying 25 computers.
3. Qualified teaching faculty should be appointed to teach computer education paper.
4. Though the trainees agreed that the syllabus was sufficient and more relevant, due to lack of time for practicals the trainees suggested reduction of the syllabus in practicals. As suggested by some of the trainees the practicals could be started right from the beginning of the course.
5. Educational Technology and Computer education were included in one paper in B.Ed syllabus (50:50). The computer education paper could be introduced as a full-fledged paper by separating it from Education Technology.

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