



Evaluation Framework for ICT Use in Teacher Education **(A Case Study of the Colleges of Teacher Education)**

Dr. G. R. Angadi

Assistant Professor, BLDEA's JSS College of Education, P. G. Dept. of Studies in Education
and Research Centre, Vijayapur-586101, Karnatak, India

Abstract

In this study the researcher evaluated the overall use of ICTs Using the ICTs Competency Framework for Teachers (ICT-CFT) and to identified the strengths and weaknesses of ICT-CFT in evaluating ICT use in Colleges of Education and to improve the ICT-CFT to meet evaluation needs of ICTs in Teacher education as it is input for the study. The competency framework for teachers was then used to evaluate information and communication technology (ICT) used in pre-service teacher education that is B.Ed. to enable the investigator to identify its strengths and weaknesses. The framework is then improved towards a new framework that can be effectively used to evaluate information and communication technology use in pre-service teacher education. In this study the independent variables are derived from computer use within the institution, some other extraneous factor may have impact on the results. Those factors may be computer use at home, friend's home and cyber or internet centers by the respondents. It is an attempt has been made to hold these extraneous variables, but it is very difficult to determine at what extent which affect the result. This work contributes to the theory, practice and policy regarding ICT integration in education.

Keywords: Evaluation Framework, ICT Use in Teacher Education and ICT-CFT.

Introduction

There is an emerging broad consensus worldwide about the benefits that can be brought to school and teacher education through the appropriate use of evolving information and communication technologies. The range of possible benefits covers practically all areas of activity in which knowledge and communication play a critical role: from improved teaching and learning processes to better student learning outcomes, from increased student engagement to seamless communication with parents and from school networking and twinning to more efficient management and monitoring within the school. All in all, this is not surprising since the windows of opportunity that ICT offers for the development of knowledge economies and societies are open also for education. A number of issues may hinder schools and teachers in their efforts to fully benefit from these windows of opportunity. They may not be able to afford the equipment, they may lack access to the Internet, or suitable materials might not be available in their own language. However, a fundamental issue is whether teachers know how to use ICT effectively in their teaching. Clearly, the way ICT is used will depend on the subject being taught, the learning objectives and the nature of the students. Nonetheless, it is important to set out the basic principles which should guide the use of ICT in teaching, and this is what the UNESCO ICT Competency Framework for Teachers (ICT-CFT) project does. The Framework project draws attention to the many ways in which ICT can transform education. ICT offers



engaging and fast-evolving learning environments, blurs the boundaries between formal and informal education and prompts teachers to develop new ways of teaching and enabling students to learn. Ultimately, it requires education to re-think what skills and competencies students need to become active citizens and members of the workforce in a knowledge society.

ICT in teacher education

Computers and related technologies are increasingly influencing many aspects of our social and work lives as well as many of our leisure activities and they have the potential to transform the nature of education (UNESCO, 2002). Education, one of the man's oldest social activities, is slowly catching the wind of these new computer mediated technologies. These new technologies coupled with a worldwide challenge to educate all children, has led to a global reform and development of teacher education. Given that teachers act as the change agents for technology in education, it is essential that in-service and pre-service teachers have basic ICT skills and competencies (UNESCO, 2002). UNESCO (2000) emphasizes that teachers and school administration staff must be given training that enable them to integrate ICTs into their teaching programs.

India has placed considerable emphasis on the importance of ICT in its NME-ICT project; the MHRD has taken steps to support the implementation of the project nation wide. In addition, there are many other organizations involved directly with the ministry of human resource that continue to be active in implementing and supporting projects involving ICT in education. Information about some of these organizations has been synthesized later in the project.

Most of the significant developments that one can observe today can be attributed to the impact of Science and Technology. While the advantages of using modern tools and technological innovations in the day-to-day-life are well recognized, the corresponding changes in the use of new technologies, for teaching learning and governance of HEIs, leave much to be desired. Technological advancement and innovations in educational transactions have to be undertaken by all HEIs, to make a visible impact on academic development as well as administration. At a time when our educational institutions are expected to perform as well as their global partners, significant technological innovations have to be adopted. Traditional methods of delivering higher education have become less motivating to the large number of students. To keep pace with the developments in other spheres of human endeavor, HEIs have to enrich the learning experiences of their wards by providing them with the State of the Art educational technologies. The campus community must be adequately prepared to make use of the Information and Communication Technology (ICT) optimally. Conscious effort is also needed to invest in hardware, and to train the faculty suitably.

With the onset and proliferation of Information and Communication Technology (ICT), there is a growing demand that it be included in school education also. It has become more of a fashion statement to have computers or multimedia in schools, the result being that in spite of its potential to make learning liberating, its implementation is often not more than cosmetic. It is



also often touted as a panacea for shortage of teachers. These are detrimental to the learning of the child. Teacher education needs to orient and sensitize the teacher to distinguish between critically useful, developmentally appropriate and the detrimental use of ICT. In a way, ICT can be imaginatively drawn upon for professional development and academic support of the pre-service teachers.

Evaluation of ICT in education

Reviewed literature suggests that there has been substantial financial investment in computer use at all educational levels. The motivation for such investment is varied, but often justified in terms of the potential impact that computer use has to enhance students' learning (Twining, 2002). This situation, in which substantial amount of money are being invested in ICT in education but are not having substantial impact in schools is not sustainable. In order to justify continuity of investment, evidence needs to be found of ICT's use effectiveness, and ways need to be found to increase the impact of those investments. There is, therefore great need to enhance the impact of investing in computer use in education at all levels (Twining, 2002).

Evaluation frameworks

Current approaches to course evaluation particularly in higher education, still seem to follow the paradigm laid by Bloom (1970) when he defined evaluation as a process of determining the achievement of specific educational objectives. Illuminative evaluations use qualitative techniques to describe the impact of technology. Measuring the impact of technology is not the main concern. Rather, the goal of this type of evaluation is to uncover problems, issues or concerns. Participatory evaluations 'involve a partnership between evaluation personnel and different evaluation audiences'. Integrative evaluations are concerned with the goal of effectively integrating technology into a teaching and learning situation.

In this present study the use of ICTs Competency Framework for Teachers (ICT-CFT), to identify the strengths and weaknesses of ICT-CFT in evaluating ICT use in Colleges of Education and to improve the ICT-CFT to meet evaluation needs of ICTs in Teacher education as it is input for the study. The computer practice framework was then used to evaluate Information and Communication Technology (ICT) used in pre-service teacher education that is B.Ed. to enable the investigator to identify its strengths and weaknesses. The framework is then improved towards a new framework that can be effectively used to evaluate information and communication technology use in pre-service teacher education. In this study the independent variables are derived from computer use within the institution, some other extraneous factor may have impact on the results. Those factors may be computer use at home, friends home and cyber or internet centers by the respondents. It is an attempt has been made to hold these extraneous variables, but it is very difficult to determine at what extent which affect the result.

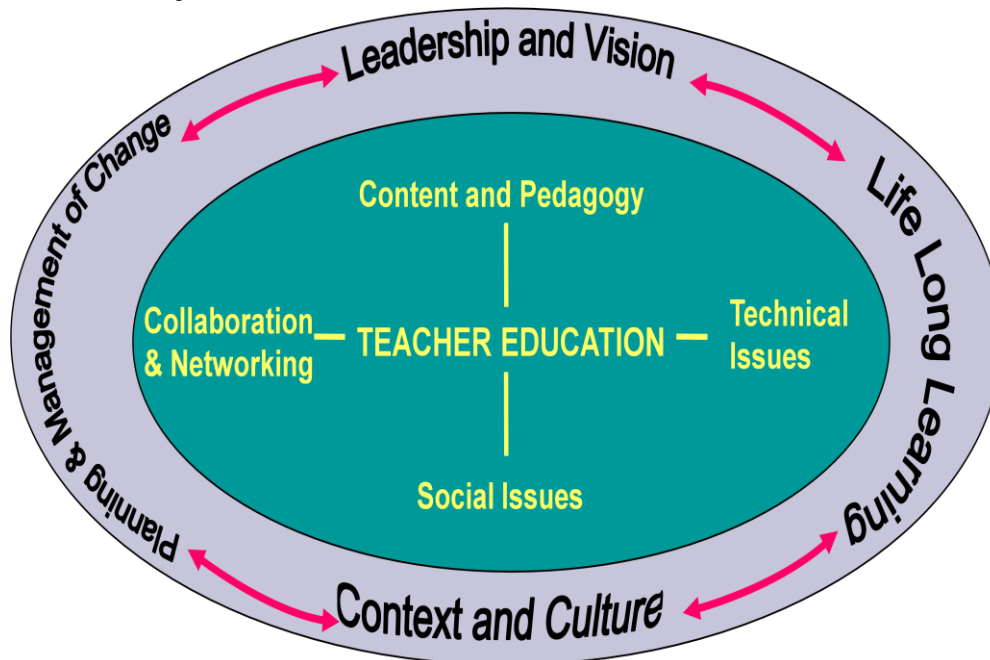
Framework for ICTs in teacher education



Figure 1 shows the curriculum framework is comprised of four clusters of competencies encircled by four supportive themes. The curriculum framework also suggests that each teacher is allowed to interpret the framework within his or her context and personal approach to pedagogy, which is always related to the subject discipline or content area, rather than to the technology itself. The four themes that bind the curriculum as a whole are described briefly below, followed by descriptions of the four core competencies.

Context and Culture identifies the culture and other contextual factors that must be considered in infusing technology into teacher education curriculum. It includes the use of technology in culturally appropriate ways and the development of respect for multiple cultures and contexts, which need to be taught and modeled by teachers. Leadership and Vision are essential for the successful planning and implementation of technology into teacher education and require both leadership and support from the administration of the teacher education institution. Lifelong Learning acknowledges that learning does not stop after school. In common with the other themes, it is important that teachers and teacher preparation faculty model lifelong learning as a key part of implementation, and as an ongoing commitment to ICTs in teacher education. Planning and Management of Change is the final theme, born of today's context and accelerated by technology itself. It signifies the importance of careful planning and effective management of the change process.

These themes may be understood as a strategic combination of approaches that help teacher educators develop the four core competencies. The core competencies may be seen as clusters of objectives that are critical for successful use of ICTs as tools for learning.



Source: UNESCO's Planning Guide: Information-Communication Technologies in Teacher Education (2002)

Figure 1: Framework for ICTs in teacher education (UNESCO, 2002)



According to UNESCO (2002), ICT in teacher education can be organized around four competencies as follows: The ICT competencies are organized into four groups. Pedagogy is focused on teachers' instructional practices and knowledge of the curriculum and requires that they develop applications within their disciplines that make effective use of ICTs to support and extend teaching and learning. Collaboration and Networking acknowledges that the communicative potential of ICTs to extend learning beyond the classroom walls and the implications for teachers development of new knowledge and skills. Technology brings with it new rights and responsibilities, including equitable access to technology resources, care for individual health, and respect for intellectual property included within the Social Issues aspect of ICT competence. Finally, Technical Issues is an aspect of the Lifelong Learning theme through which teachers update skills with hardware and software as new generations of technology emerge.

Significance of the study

As technological advances continue to evolve and proliferate, teachers, teacher educators and administrators have sought to integrate technological innovations into the classroom. Introducing ICTs in the education sector can be quite costly in terms of up-front costs (for acquiring basic infrastructure) and the recurrent costs (maintenance and human resources training and development). With this rise in implementation and demand comes an increased need to evaluate the effectiveness of technology in teacher education. A proper evaluation of ICT-CFT use in education in general and teacher education in particular will help us to learn from past experiences, improve service delivery, plan and allocate resources, evaluate policies and demonstrate results as part of accountability to key stakeholders. This is important since a bigger chunk of our implementation funds (MHRD NME-ICT) are to be provided for by our development partners (Intel Teach to Teachers, Microsoft IT Academy) and volunteers. The stakeholders will want to know whether the performance indicators are being achieved.

Statement of the problem

'A Framework for Evaluating the ICT Use in Teacher Education: A Case Study of the Colleges of Teacher Education in Karnataka.'

Objectives of the study

1. To evaluate the overall use of ICTs Using the Information and Communication Technology Competency Framework for Teachers (ICT-CFT).
2. To identify the strengths and weaknesses of ICT-CFT in evaluating ICT use in Colleges of Education.

Methodology



The descriptive survey research design has been used in the study, descriptive method is used to describe systematically the facts and characteristics of a given population or area of interest, factually and accurately.

Descriptive studies are generally categorized into two main groups. These are, survey research and direct observation research. Survey research makes use of questionnaires for data gathering, while direct observation research makes use of observations. These indications make it clear that the current study is in fact a survey research, as it uses questionnaire, and Interview towards the ICT-CFT to collect data from the subjects.

Population of the study

The study was conducted to evaluate the overall use of ICTs Using the Information and Communication Technology Competency Framework for Teachers (ICT-CFT), to identify the strengths and weaknesses of ICT-CFT in evaluating ICT use in Colleges of Education and to improve the ICT-CFT to meet evaluation needs of ICTs in Teacher education, this study was conducted in colleges of education in Karnataka, the colleges of education student teachers, teacher educators and principals were made as population of the study because the destiny of the nation shaped in the classroom, the classroom teachers are trained in the colleges of education, to make teachers training more relevant to the needs and demands of the country with the latest national(NME-ICT) and international (UNESCO) trends in teacher education. Currently there are 345 colleges of education (2015) in Karnataka which are almost all have computer laboratory and are making efforts to establish and to improve the ICT Resource Centre as per NCTE norms. The enrollment on an average of 34500 students' yearly, for one academic year and two semesters with 2415 teacher educators and 345 principals approximately constitutes the population of the study.

Sample and sampling technique

The sample of the study were chosen by purposively (Purposive sampling method, the researcher selects a 'typical group' of individuals who might represent the larger population and then collects data from this group) Rani Channamma University, Belagavi affiliated colleges of education, the total colleges of education in this university are 43 they are distributed in three districts Viz: Belagavi, Vijayapur and Bagalkot., It is further selected the student teachers sample by cluster sampling (A researcher selects sampling units at random and then does complete observation of all units in the group) technique, Teacher Educators by simple random (Simple Random Sampling have the same chance (probability) of being selected. Random method provides an unbiased cross selection of the population) Sampling and Principals' by Snowball (In snowball sampling, the researcher identifying and selecting available respondents who meet the criteria for inclusion in his/her study. After the data have been collected from the subject, the researcher asks for a referral of other individuals, who would also meet the criteria and represent the population of concern) Sampling from colleges of education in three districts as shown in the following table 1



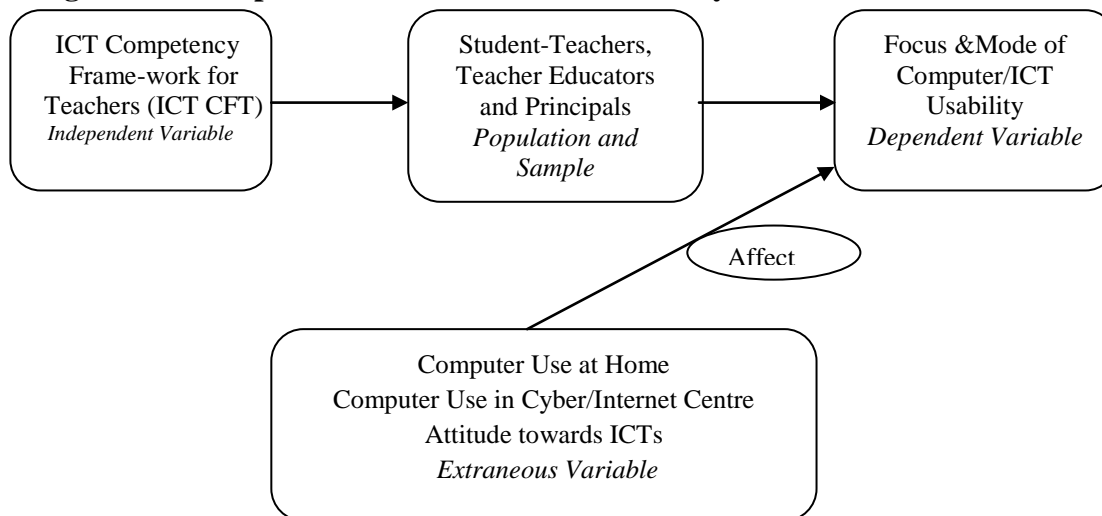
Table1: The Representation of the sample.

Sl. No.	District	Number of Colleges	Number of Student Teachers		Number of Teacher Educators		Number of Principals'	
			Male	Female	Male	Female	Male	Female
1	Vijayapur	14	70	70	66	18	8	2
2	Bagalkot	07	35	35	31	11	4	1
3	Belagavi	22	110	110	110	22	13	2
Total		43	215	215	207	51	25	5
			430		258		30	

Design of the study

Since the purpose of the study was to evaluate the overall use of ICTs Using the Information and Communication Technology Competency Framework for Teachers (ICT-CFT), to identify the strengths and weaknesses of ICT-CFT in evaluating ICT use in Colleges of Education and to improve the ICT-CFT to meet evaluation needs of ICTs in Teacher education, hence mixed method research design has been chosen to study it. The method and procedure to achieve the objectives of the study were as depicted in the following conceptual framework as follows in the figure 2:

Figure 2: Conceptual framework of research study



Instruments used for data collection

After going through the relevant literature, keeping in view the nature of the problem, descriptive i.e. survey type study was considered appropriate and a questionnaire was used as research tool for the collection of data. The questionnaire items for this study were in the form of Likert Scale. The questionnaire was designed to collect information on students' and teachers' attitude, skills and utilization of ICTs in colleges of teacher education.

Questionnaires for student teachers and Teacher educators and Interview for Principals were chosen as the best tools for the present study because of number of reasons: more number



of colleges of education and therefore it was practically difficult to interview the target respondents (student teachers and Teacher educators). It gives respondents anonymity, student teachers and Teacher educators would fill them truthfully thus improving reliability of the results and it is an economical and convenient way of collecting data especially where there are time constraints.

a. Questionnaire

Two different questionnaires were prepared for Student teachers and Teacher educators separately. While constructing the questionnaires it was kept in mind that each statement must express a definite idea and option about a particular subject. While the majority of questions were different, a number of questions were similar for validity and reliability reasons. The questionnaires consisted of both open and closed-ended questions.

b. Interview

Qualitative method was used in the form of in depth interview were mainly conducted with the Principals of colleges of education, the structured interview schedule have a 20 items. Again it was difficult to interview with principals as a majority of them were in-charge or staff gap principals.

Secondary sources of data

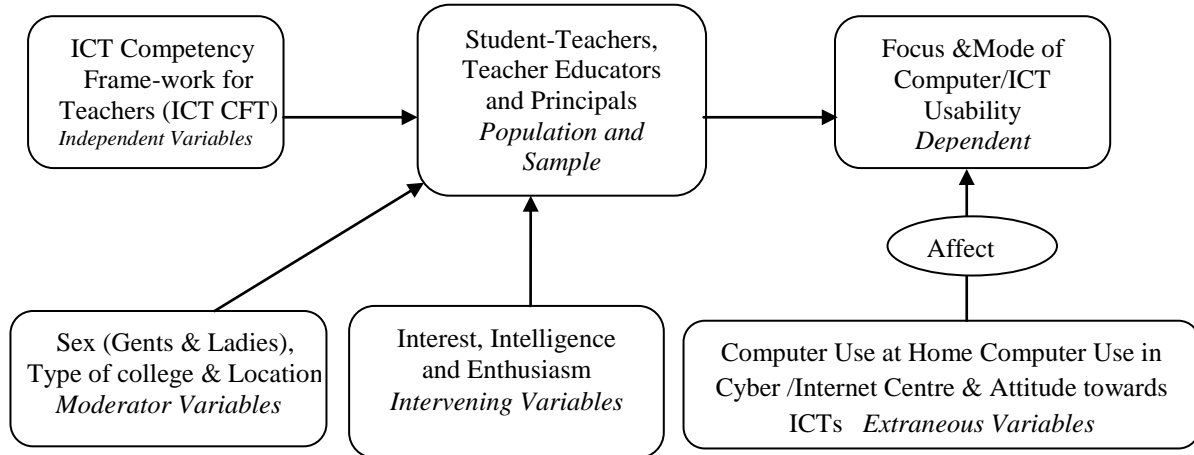
A good number of secondary sources were consulted throughout the project and especially during the period of data collection process. Many international and national bodies that deal with education and teacher education produce the periodical reports on the status of various aspects of education and teacher education. Such international bodies are United Nations Education Social and Cultural Organisation (UNESCO), Common Wealth of Learning (COL) and InfoDev which is a publication of World Bank and National bodies like Ministry of Human Resource Development (MHRD), University Grants Commission (UGC), National Assessment and Accreditation Council (NAAC), National Council for Teacher Education (NCTE), National Council of Educational Research and Training (NCERT), National Mission on Education through Information and Communication Technology (NME-ICT) and National Programme of Technology Enabled/Enhanced Learning (NPTEL) etc.

Variables of the study

The diagrammatic presentation of the variables is given in Figure 3.



Figure 3: Interrelationship between variables.



Procedure of data collection

Questionnaire for student teachers and teacher educators: First of all researcher took permission from the principal of colleges of education which were included in the sample. After sought permission the researcher had gone to the different colleges of education one by one. During administration of questionnaire, researcher has established the rapport with the respondents and requested to all student teachers and teacher educators for their co-operation to conduct the study fruitfully. After that researcher distributed the questionnaires to student teachers and requested them first of all to fill General information in general information sheet and then provided necessary instructions for responding on questionnaire, after responding to the questionnaire collected the filled in questionnaire from the student teachers and the similarly same procedure has been followed to collect the response from the teacher educators.

Interview schedule for principals: This tool was also prepared by the researcher. The aim of this tool was to evaluate the ICT infrastructure and its usability by the student teachers and teacher educators of the colleges of education by getting the feedbacks from the principals. The tool was prepared on the bases of frame work of the ICT-CFT. Interview was kept unstructured so principals can show their views on any aspect of the ICT infrastructure, its usability and learning experiences.

Data analysis

This study is concerned with determining the levels of computer use, using the ICT-CFT. The study takes the amount of computer use and then identifies the focus of the use. This information and others are then used to develop an evaluation framework for colleges of teacher education (B.Ed colleges). The amount of computer use is determined by calculating the total amount of time computers are in use in relation to the 8 hours a day (as per UGC guidelines for teaching / learning hours) of learning and teaching on weekdays. It was calculated by percentage techniques and analysed the data.



The next part of the analysis looks at the focus of the computer use. It determines the extent of computer use dedicated to learning ICT, learning about other subjects other than computers here computer is using as learning tool and what extent of use that serve other purposes other than ICT and learning tool. The last part of the ICT-CFT analyses the mode of the learning tool aspect of the focus. It determines the levels at which the computers are used to support, extend and transform learning.

The quantity of computers use was given by respondents through answering an open ended question. Likert scale questions were analysed by percentage technique to arrive at the focus and mode segments of computer use in the various colleges of education studied. The comparisons between different modes of computer use are presented in the percentage technique and analysed it.

Analyses of Teacher Educators Questionnaire

Table 4: Gender wise Frequencies of Respondents

Gender	Frequencies	Percentage
Male	207	80.23%
Female	51	19.77%
Total	258	100%

Table 4 indicates that out of 258 respondents 80.23% respondents were male and 19.77%.were female teacher educators.

Table 5: Age wise frequencies of respondents

Age in Years	Frequencies	Percentage
26-35	113	43.80%
36-45	93	36.04%
46-55	47	18.22%
56-62	5	1.94%

The above table 5 shows that out of 258 teacher educators 43.80% were between 26-35 years of age while 36.04% belongs to the age group of 36-45 years the age group 46-55 has 18.22% and 56-62 years of age with only 1.94%.

Table 6: Educational qualifications frequencies of respondents

Edl. Qualification	Frequencies	Percentage
Post Doc. with M. Ed	-	-
Ph. D with M. Ed	37	14.34%
M. Phil with M. Ed	139	53.88%
M.A./M.Sc. with M. Ed	73	28.30%



B.A./B.Sc. with M. Ed	9	3.49%
-----------------------	---	-------

Table 6 shows that out of 258 teacher educators, the of the majority teacher educators that is 53.88% has M. Phil with M. Ed degree and M.A. / M.Sc. with M. Ed 28.30% and Ph. D with M. Ed qualification is 14.34% and B.A. /B.Sc. with M. Ed only 3.49% Highest qualification is post doctoral nobody has this qualification among 258 teacher educators.

Table 7: Teaching experience frequencies of respondents

Teaching experience	Frequencies	Percentage
Less than 5 Years	8	3.1%
More than 5 and less than 10 Years	116	44.96%
More than 10 and less than 20 Years	115	44.57%
More than 20	19	7.36%

Table 7 shows that majority of the respondents 44.96% have more than more than 5 and less than 10 years of teaching experience, just near majority of the respondents 44.57% have more than more than 10 and less than 20 years of teaching experiences, More than 20 years of teaching experiences has 7.36% and Less than 5 Years of teaching experience has only 3.1%.

Table 8: College type of respondent frequencies

Teaching experience	Frequencies	Percentage
Private Un-aided	212	82.17%
Private Aided	31	12.01%
Government	15	5.81%

Table 8 shows that majority of the respondents 82.17% has private un-aided colleges of teacher education, 12.01% has teacher educators of private aided colleges of teacher education and just 5.81% has teacher educators of Government colleges of teacher education.

Quantity of computer and internet use

In establishing the quantity of computer and internet use by teacher educators, teacher educators were asked to indicate the number of hours in which they have access to computer and internet in a week. The following assumptions were made:

Access to computers implies having a computer available for use regardless of the purpose of its use, The computers could only be available for 8 hours a day for 5 days and 5 hours on Saturday in a week- time during which teaching and learning takes place, resulting into a total of 45 hours per week, Quantity of computers use restricted to use within the colleges. Any access to computers outside the college is not factored but it considered.

Quantity of computer and internet use by teacher educators

A total number of 258 teacher educators who returned their filled in questionnaires responded by indicating the number of hours they use computers at their various colleges of education.



Table 9: Quantity of computer and internet use by teacher educators

Location	Access to Computers		Access to Internet	
	Yes	No	Yes	No
Home	89	169	53	205
College	205	53	143	115
Net Zone/ Cyber Cafe	31	227	87	171
Any others (Specify)	-	258	198	60

From the above table 9 shows that 205 teacher educators use the computer in colleges, 89 at their home and 31 at net zone/ cyber cafe, 53 teacher educators not using the computer in colleges. 198 teacher educators access to the internet at their smartphones, 143 accesses to the internet in colleges, 87 accesses to the internet in net zone/ cyber cafe, only 53 accesses to the internet at their home and 115 teacher educators not accessing the internet in colleges.

Table 10: Location of computers use in college frequencies of respondents

Location	Frequencies
Staff room	0
Computer lab	162
Classroom	83
Library	35
Office	129
Principal chamber	218

The above table 10 shows that 218 teacher educators use the computer in principal chambers, 162 in computer laboratory, 129 in office, 83 in classroom, 35 in library and none in staffroom it means no one has computers in their staffroom.

Table 11: Computer laboratory available in college frequencies of respondents

Computer Laboratory	Frequencies	Percentage
Yes	169	65.50%
No	89	34.50%

The above table 11 shows that 169 teacher educators says that computer laboratory available in their college and 89 teacher educators says that no computer laboratory available in the their college.

Table 12: Number of computers in the computer laboratory frequencies of respondents

Number of computers	Frequencies	Percentage
Less than 5	26	10.07%
More than 5 and less than 10	51	19.77%
More than 10 and less than 20	89	34.50%
More than 20 and less than 30	53	20.54%



More than 30 and less than 40	28	10.85%
More than 50	11	4.26%

Table 12 shows that 34.50% of the teacher educators says that 10-20 computers are available in their college computer laboratory, 20.54% of the teacher educators says that 20-30, 19.77% of the teacher educators says that 5-10, 10.85% of the teacher educators says that 30-40, 10.07% of the teacher educators says that less than 5 and 4.26% of the teacher educators says that more than 50 computers are available in their college computer laboratory.

Table 13: Number of hours per week computer and internet use by teacher educators

Computer and internet use hours/week	Frequencies	Percentage
Not use	9	3.49%
Less than 5 hrs	36	13.95%
More than 5hrs and less than 10hrs	107	41.47%
More than 10hrs and less than 20hrs	63	24.42%
More than 20hrs and less than 30hrs	31	12.02%
More than 30hrs and less than 40hrs	12	4.65%
Total	258	100%

Table 13 shows that 41.47% of the teacher educators use computers and internet 5-10 hours per week, 24.42% of the teacher educators says that 10-20 hours per week, 13.95% of the teacher educators says that less than 5 hours per week, 12.02% of the teacher educators says that 20-30 hours per week, 4.65% of the teacher educators says that 30-40 hours per week and not use computers and internet by 3.49% of the teacher educators.

Table 14: Purpose of internet use by the teacher educators

Purpose of internet use	Frequencies	Percentage
Educational	73	28.30%
Chatting	45	17.44%
Entertainment	56	21.70%
Time pass	24	9.30%
Not using	60	23.25%
Total	258	100%

Table 14 shows that 28.30% of the teacher educators says that they use internet for educational purposes, 23.25% of the teacher educators says that they are not using internet at all, 21.70% of the teacher educators says that they use internet for entertainment, 17.44% of the teacher educators use internet for chatting, 6.30% of the teacher educators says that they use internet for time pass purpose.



Table 15: Teacher educators rated their level of expertise in ICT skills

Level of expertise in ICT skills	Frequencies	Percentage
Excellent	27	10.47%
Very good	48	18.60%
Good	51	19.77%
Fair	73	28.29%
Not expertise	59	22.87%
Total	258	100%

The above table 15 shows that 10.47% teacher educators opines that they have excellent level of expertise in ICT skills, 18.60% says that they are very good level of expertise in ICT skills, 19.77% says that they are having good level of expertise in ICT skills, 28.29% says that they are fair level of expertise in ICT skills and 22.87% Teacher educators felt that they are not at all expertise in ICT skills.

Table 16: Teacher educators' reason for acquiring further ICT skills and competencies

ICT skills and competencies for	Frequencies	Percentage
Prestige	13	5.04%
Job purpose	106	41.09%
Use it to information and communication purpose quickly and fastly	121	46.90%
Fashion	18	6.98%
Total	258	100%

Table 16 shows that 46.90% of the teacher educators says the reason for acquiring further ICT skills and competencies for use it to information and communication purpose quickly and fastly, 41.09% of the teacher educators says the reason for acquiring further ICT skills and competencies for job purpose, 6.98% of the teacher educators says that for fashion and 5.04% of the teacher educators says the reason for acquiring further ICT skills and competencies for prestige

Table 17: Teacher educators rated their skills and competencies in the following ICT areas

Component(area)	Excellent		Very good		Good		Fair		Poor	
	Fre q.	%	Fr eq.	%	Fre q.	%	Fre q.	%	Fre q.	%
Word processing	32	12.40%	34	13.18%	48	18.60%	57	22.09%	87	33.72%
Spreadsheets	13	5.04%	19	7.36%	43	16.67%	69	26.74%	112	3.41%



Presentation tools	37	14.3 4%	42	16.28 %	59	22.87 %	79	30.62 %	41	15.89 %
DTPs	33	12.8 0%	37	14.34 %	53	20.54 %	73	28.29 %	62	24.03 %
SPSS/PASW	3	1.16 %	12	4.65 %	11	4.26 %	17	6.59 %	21 5	83.33 %
Internet	57	22.0 9%	53	20.54 %	69	26.74 %	47	18.22 %	32	12.40 %
Social sites	73	28.3 0%	61	23.64 %	67	25.97 %	28	10.85 %	29	11.24 %
Multimedia tools	5	1.94 %	7	2.71 %	18	6.98 %	33	12.79 %	19 5	75.58 %
Smartphone use	69	26.7 4%	71	27.51 %	49	19.00 %	31	12.01 %	38	14.73 %
Tablet use	3	1.16 %	24	9.30 %	38	14.73 %	34	13.18 %	15 9	61.63 %
Basic repairs and maintenance	6	2.33 %	17	6.59 %	23	8.91 %	52	20.16 %	16 8	65.12 %

The above table 17 shows that Teacher educators rated their skills and competencies as excellent 12.40% in word processing, 5.04% in spreadsheets, 14.34% in presentation tools, 12.80% in DTPs, only 1.16% in SPSS/PASW, 22.09% in internet, 28.30% in social sites, 1.94% in multimedia tools, 26.74% in smartphones use, 1.16% in tablet use and 2.33% in basic repairs and maintenance.

Teacher educators rated their skills and competencies as very good 13.18% in word processing, 7.36% in spreadsheets, 16.28% in presentation tools, 14.34% in DTPs, 4.65% in SPSS/PASW, 20.54% in internet, 23.64% in social sites, only 2.71% in multimedia tools, 27.51% in smartphones use, 9.30% in tablet use and 6.59% in basic repairs and maintenance.

Teacher educators rated their skills and competencies as good 18.60% in word processing, 16.67% in spreadsheets, 22.87% in presentation tools, 20.54% in DTPs, only 4.26% in SPSS/PASW, 26.74% in internet, 25.97% in social sites, 6.98% in multimedia tools, 19.00% in smartphones use, 14.73% in tablet use and 8.91% in basic repairs and maintenance.

Teacher educators rated their skills and competencies as fair 22.09% in word processing, 26.74% in spreadsheets, 30.62% in presentation tools, 28.29% in DTPs, 6.59% in SPSS/PASW, 18.22% in internet, 10.85% in social sites, 12.79% in multimedia tools, 12.01% in smartphones use, 13.18% in tablet use and 20.16% in basic repairs and maintenance.

Teacher educators rated their skills and competencies as poor 33.72% in word processing, 3.41% in spreadsheets, 15.89% in presentation tools, 24.03% in DTPs, 83.33% in SPSS/PASW, 12.40% in internet, 11.24% in social sites, 75.58% in multimedia tools, 14.73% in smartphones use, 61.63% in tablet use and 65.12% in basic repairs and maintenance.



Table 18: Teacher educators use ICTs for the following different purposes

Purpose of ICT Use	Very often		Often		Rarely		Never	
	Fre q.	%	Fre q.	%	Fre q.	%	Fre q.	%
Teaching my MOT subjects	38	14.7 3%	6 7	25.9 7%	8 1	31.4 0%	7 2	27.9 0%
Learning specific subjects (to stay abreast with emerging professional issues)	51	19.7 7%	5 9	22.8 7%	9 3	36.0 5%	5 5	21.3 2%
Learning ICT skills.	29	11.2 4%	6 5	25.1 9%	9 7	37.6 0%	6 7	25.9 7%
Searching and accessing educational resources.	32	12.4 0%	8 7	33.7 2%	7 5	29.0 7%	64	24.8 0%
Preparing PPTs and updating it.	44	17.0 5%	7 6	29.4 6%	8 1	31.4 0%	57	22.0 9%
Preparing lessons / lectures notes	27	10.4 7%	3 9	15.1 2%	9 8	37.9 8%	94	36.4 3%
Developing e-content	-	-	-	-	5	1.94 %	25 3	98.0 6%
Developing ICT based resources	14	5.43 %	2 9	11.2 4%	3 8	14.7 3%	17 7	68.6 0%
Communicating with teacher-educators	89	34.5 0%	8 3	32.1 7%	5 2	20.1 6%	34	13.1 8%
Communicating with friends/student-teachers.	97	37.6 0%	7 2	27.9 0%	6 8	26.3 6%	21	8.14 %
Keeping track of student performance	17	6.59 %	3 8	14.7 3%	4 9	19.0 0%	15 4	59.6 9%
Updating college website.	7	2.71 %	1 2	4.65 %	2 7	10.4 7%	21 2	82.1 7%
Searching the information of University/DSERT/DCE/NCTE/UGC/I CSSR/NCERT/NAAC etc.	35	13.5 7%	6 9	26.7 4%	8 7	33.7 2%	67	25.9 7%

The above table 18 reveals that Teacher educators very often used ICTs for teaching their MOT subjects 14.73%, learning specific subjects that is to stay abreast with emerging professional issues 19.77%, learning ICT skills 11.24%, searching and accessing educational resources 12.40%, preparing and updating PPTs 17.05%, Preparing lessons / lectures notes 10.47%, developing ICT based resources 5.43%, communicating with teacher-educators 34.50%, Communicating with friends/student-teachers 37.60%, Keeping track of student performance



6.59%, updating college website 2.71% and Searching the information of University/DSERT/DCE/NCTE/UGC/ ICSSR/NCERT/NAAC etc. for 13.57%.

Teacher educators often used ICTs often for teaching their MOT subjects 25.97%, learning specific subjects that is to stay abreast with emerging professional issues 22.87%, learning ICT skills 25.19%, searching and accessing educational resources 33.72%, preparing and updating PPTs 29.46%, Preparing lessons / lectures notes 15.12%, Developing e-content only 1.94%, developing ICT based resources 11.24%, communicating with teacher-educators 32.17%, Communicating with friends/student-teachers 27.90%, Keeping track of student performance 14.73%, updating college website 4.65% and 26.74%, for searching the information of University/DSERT/DCE/NCTE/UGC/ ICSSR/NCERT/NAAC etc.

Teacher educators rarely used ICTs for teaching their MOT subjects 31.40%, learning specific subjects that is to stay abreast with emerging professional issues 36.05%, learning ICT skills 37.60%, searching and accessing educational resources 29.07%, preparing and updating PPTs 31.40%, Preparing lessons / lectures notes 37.98%, Developing e-content developing ICT based resources 1.94%, communicating with teacher-educators 14.73%, Communicating with friends/student-teachers 20.16%, Keeping track of student performance 19.00%, updating college website 10.47% and 33.72%, for searching the information of University/DSERT/DCE/NCTE/UGC/ ICSSR/NCERT/NAAC etc.

Teacher educators never used ICTs for teaching their MOT subjects 27.90%, learning specific subjects that is to stay abreast with emerging professional issues 21.32%, learning ICT skills 25.97%, searching and accessing educational resources 24.80%, preparing and updating PPTs 22.09%, Preparing lessons / lectures notes 36.43%, Developing e-content developing ICT based resources 98.06 %, Developing ICT based resources 68.60%, communicating with teacher-educators 13.18%, communicating with friends/student-teachers 8.14%, Keeping track of student performance 59.69%, updating college website 82.17% and 25.97% for searching the information of University/DSERT/DCE/NCTE/UGC/ ICSSR/NCERT/NAAC etc.

Table 19: Teacher educators think ICTs can be used for the purposes below

Teacher educators think ICTs can be used for the Purposes	No		Yes		Not Sure	
	Freq.	%	Freq.	%	Freq.	%
As a substitute for teaching.	129	50.00%	51	19.77%	78	30.23%
Keep learners busy while a teacher does something else with ICT tools.	63	24.42%	118	45.74%	77	29.84%
To impress students and other stakeholders.	186	72.09%	19	7.36%	53	20.54%
Use it in enhancing teaching and learning.	46	17.83%	152	58.91%	60	23.26%
Updating professional knowledge and skills.	53	20.54%	158	61.24%	47	18.22%

The above table 19 shows that 50.00% Teacher educators think ICTs can not be used as a substitute for teaching, 24.42% Teacher educators think ICTs can not be used as keep learners busy while a teacher does something else with ICT tools, 72.09%Teacher educators think ICTs can not be used to impress students and other stakeholders, 17.83% Teacher educators think



ICTs can not be used it as, it enhancing teaching and learning, 20.54% Teacher educators think ICTs can not be used as updating professional knowledge and skills.

19.77% Teacher educators think ICTs can be used as a substitute for teaching, 45.74% Teacher educators think ICTs can be used as keep learners busy while a teacher does something else with ICT tools, 7.36% Teacher educators think ICTs can be used to impress students and other stakeholders, 58.91% Teacher educators think ICTs can be used it as, it enhancing teaching and learning, 61.24% Teacher educators think ICTs can be used as updating professional knowledge and skills.

30.23% Teacher educators think ICTs not sure be used as a substitute for teaching, 29.84% Teacher educators think ICTs not sure be used as keep learners busy while a teacher does something else with ICT tools, 20.54% Teacher educators think ICTs not sure be used to impress students and other stakeholders, 23.26% Teacher educators think ICTs not sure be used it as, it enhancing teaching and learning, 18.22% Teacher educators think ICTs not sure be used as updating professional knowledge and skills.

Table 20: Proposed ICT skills emphasized in teacher education According to teacher educators, they ranked them in order of relevance to secondary teacher education.

Sl. No.	Proposed ICT related Skills	Very Necessary		Necessary		Not Necessary		
		Freq.	%	Freq.	%	Freq.	%	
I	a	Demonstrate sound understanding of ICT operational skill and concepts.	86	33.33%	142	55.04%	30	11.62%
	b	Demonstrate interest in continual growth of technology knowledge so as to stay abreast of current and emerging technologies.	89	34.50%	137	53.10%	32	12.40%
	c	Demonstrate advance ICT competence and teaching skills through mentored innovation.	75	29.07%	149	57.75%	34	13.18%
	d	Teachers realized that students' ability to learn is a resource pool, not a resource of drainage.	45	17.44%	184	71.32%	29	11.24%
II	a	Management and care of ICT resources.	68	26.36%	173	67.05%	17	6.59%
	b	Identify and locate technology resources suitable for meeting learning objectives.	64	24.80%	163	63.18%	31	12.01%
	c	Apply current research on teaching and learning with ICT when planning learning environment.	32	12.40%	179	69.38%	47	18.21%
	d	Design learning strategies that use ICT to support the diverse needs of learners.	36	13.95%	169	65.50%	53	20.54%



III	a	Apply ICT to develop students' creativity.	87	33.7 2%	15 4	59.6 9%	17	6.59 %
	b	Manage students learning in a technology enhanced environment.	102	39.5 3%	11 7	45.3 5%	39	15.11 %
	c	Facilitate technology enhanced experiences that address content standards and students information technology standards.	74	28.6 8%	12 5	48.4 5%	59	22.86 %
	d	Student-driven learning utilizes the Internet to gather content knowledge.	58	22.4 8%	97	37.6 0%	103	39.92 %
IV	a	Use technology in assessing student learning of subject matter using a variety of assessment techniques.	57	22.0 9%	13 5	52.3 2%	66	25.58 %
	b	Use technology resources to engage in on-going professional development and life-long learning.	62	24.0 3%	13 7	53.1 0%	59	22.86 %
	c	Use technology to collaborate with peer and stakeholders.	41	15.8 9%	13 9	53.8 7%	78	30.23 %
	d	Reflect on professional practice to make informed decisions regarding use of technology for teaching/learning.	69	26.7 4%	12 8	49.6 1%	61	23.64 %
V	a	Identify and use technology resources that affirm diversity.	56	21.7 0%	11 8	45.7 4%	84	32.56 %
	b	Promote safe and healthy use of technology resources.	87	33.7 2%	11 4	44.1 8%	57	22.09 %
	c	Promote equal access of technology resources for all students.	89	34.5 0%	11 9	46.1 2%	50	19.38 %
	d	Teach legal and ethical practice related to technology use.	113	43.8 0%	12 4	48.0 6%	21	8.14 %
VI	a	Technology must be integrated with pedagogy.	92	35.6 6%	87	33.7 2%	79	30.62 %
	b	Teachers need to 'learn by doing', become a network.	74	28.6 8%	14 9	57.7 5%	35	13.56 %
	c	To increase the commitment of teachers in the creation of open educational resources (OER) with the use of information technology.	21	8.14 %	12 7	49.2 2%	110	42.63 %
	d	To encourage the teachers in critical thinking and creative problem solving through hands-on experimentation with ICT.	58	22.4 8%	13 9	53.8 7%	61	23.64 %

From the above table 20 depicts that the some of the proposed ICT related skills that should be emphasized in teacher education. According to teacher educators, they would rank them as in



order of relevance to secondary teacher education as interpreted. 33.33% teacher educators says that demonstrate sound understanding of ICT operational skill and concepts are very necessary, 34.50% teacher educators says that demonstrate interest in continual growth of technology knowledge so as to stay abreast of current and emerging technologies are very necessary, 29.07% teacher educators says that demonstrate advance ICT competence and teaching skills through mentored innovation is very necessary, 17.44% teacher educators says that teachers realized that students' ability to learn is a resource pool, not a resource of drainage is very necessary, 26.36% teacher educators says that management and care of ICT resources is very necessary, 24.80% teacher educators says that identify and locate technology resources suitable for meeting learning objectives are very necessary, 12.40% teacher educators says that apply current research on teaching and learning with ICT when planning learning environment is very necessary, 13.95% teacher educators says that Design learning strategies that use ICT to support the diverse needs of learners are very necessary, 33.72% teacher educators says that apply ICT to develop students' creativity is very necessary, 39.53% teacher educators says that Manage students learning in a technology enhanced environment is very necessary, 28.68% teacher educators says that Facilitate technology enhanced experiences that address content standards and students information technology standards are very necessary, 22.48% teacher educators says that Student-driven learning utilizes the Internet to gather content knowledge is very necessary, 22.09% teacher educators says that Use technology in assessing student learning of subject matter using a variety of assessment techniques are very necessary, 24.03% teacher educators says that use technology resources to engage in on-going professional development and life-long learning is very necessary, 15.89% teacher educators says that Use technology to collaborate with peer and stakeholders are very necessary, 26.74% teacher educators says that reflect on professional practice to make informed decisions regarding use of technology for teaching/learning is very necessary, 21.70% teacher educators says that Identify and use technology resources that affirm diversity is very necessary, 33.72% teacher educators says that promote safe and healthy use of technology resources teacher educators says that is very necessary, 34.50% teacher educators says that Promote equal access of technology resources for all students are very necessary, 43.80% teacher educators says that Teach legal and ethical practice related to technology use is very necessary, 35.66% teacher educators says that Technology must be integrated with pedagogy is very necessary, 28.68% teacher educators says that Teachers need to 'learn by doing', become a network is very necessary, 8.14% teacher educators says that To increase the commitment of teachers in the creation of open educational resources (OER) with the use of information technology is very necessary, 22.48% teacher educators says that To encourage the teachers in critical thinking and creative problem solving through hands-on experimentation with ICT is very necessary.

ICT related skills that should be emphasized in teacher education. According to teacher educators, they would rank them as in order of relevance to secondary teacher education as interpreted. 55.04% teacher educators says that demonstrate sound understanding of ICT operational skill and concepts are necessary, 53.10 % teacher educators says that demonstrate



interest in continual growth of technology knowledge so as to stay abreast of current and emerging technologies are necessary, 57.75% teacher educators says that demonstrate advance ICT competence and teaching skills through mentored innovation is necessary, 71.32% teacher educators says that teachers realized that students' ability to learn is a resource pool, not a resource of drainage is necessary, 67.05% teacher educators says that management and care of ICT resources is necessary, 63.18% teacher educators says that identify and locate technology resources suitable for meeting learning objectives are necessary, 69.38% teacher educators says that apply current research on teaching and learning with ICT when planning learning environment is necessary, 65.50% teacher educators says that Design learning strategies that use ICT to support the diverse needs of learners are necessary, 59.69% teacher educators says that apply ICT to develop students' creativity is necessary, 45.35 % teacher educators says that Manage students learning in a technology enhanced environment is necessary, 48.45% teacher educators says that Facilitate technology enhanced experiences that address content standards and students information technology standards are necessary, 37.60% teacher educators says that Student-driven learning utilizes the Internet to gather content knowledge is necessary, 52.32% teacher educators says that Use technology in assessing student learning of subject matter using a variety of assessment techniques are necessary, 53.10% teacher educators says that use technology resources to engage in on-going professional development and life-long learning is necessary, 53.87% teacher educators says that Use technology to collaborate with peer and stakeholders are necessary, 49.61% teacher educators says that reflect on professional practice to make informed decisions regarding use of technology for teaching/learning is necessary, 45.74% teacher educators says that Identify and use technology resources that affirm diversity is necessary, 44.18% teacher educators says that promote safe and healthy use of technology resources teacher educators says that is necessary, 46.12% teacher educators says that Promote equal access of technology resources for all students are necessary, 48.06% teacher educators says that Teach legal and ethical practice related to technology use is necessary, 33.72% teacher educators says that Technology must be integrated with pedagogy is necessary, 57.75% teacher educators says that Teachers need to 'learn by doing', become a network is necessary, 49.22% teacher educators says that To increase the commitment of teachers in the creation of open educational resources (OER) with the use of information technology is necessary, 53.87% teacher educators says that To encourage the teachers in critical thinking and creative problem solving through hands-on experimentation with ICT is necessary.

ICT related skills that should be emphasized in teacher education. According to teacher educators, they would rank them as in order of relevance to secondary teacher education as interpreted. 11.62% teacher educators says that demonstrate sound understanding of ICT operational skill and concepts are not necessary, 12.40% teacher educators says that demonstrate interest in continual growth of technology knowledge so as to stay abreast of current and emerging technologies are not necessary, 13.18% teacher educators says that demonstrate advance ICT competence and teaching skills through mentored innovation is not necessary, 11.24% teacher educators says that teachers realized that students' ability to learn is a resource



pool, not a resource of drainage is not necessary, 6.59% teacher educators says that management and care of ICT resources is not necessary, 12.01% teacher educators says that identify and locate technology resources suitable for meeting learning objectives are not necessary, 18.21% teacher educators says that apply current research on teaching and learning with ICT when planning learning environment is not necessary, 20.54 % teacher educators says that Design learning strategies that use ICT to support the diverse needs of learners are not necessary, 6.59% teacher educators says that apply ICT to develop students' creativity is not necessary, 15.11% teacher educators says that Manage students learning in a technology enhanced environment is not necessary, 22.86% teacher educators says that Facilitate technology enhanced experiences that address content standards and students information technology standards are not necessary, 39.92% teacher educators says that Student-driven learning utilizes the Internet to gather content knowledge is not necessary, 25.58% teacher educators says that Use technology in assessing student learning of subject matter using a variety of assessment techniques are not necessary, 22.86% teacher educators says that use technology resources to engage in on-going professional development and life-long learning is not necessary, 30.23% teacher educators says that Use technology to collaborate with peer and stakeholders are not necessary, 23.64% teacher educators says that reflect on professional practice to make informed decisions regarding use of technology for teaching/learning is not necessary, 32.56% teacher educators says that Identify and use technology resources that affirm diversity is not necessary, 22.09% teacher educators says that promote safe and healthy use of technology resources teacher educators says that is not necessary, 19.38% teacher educators says that Promote equal access of technology resources for all students are not necessary, 8.14% teacher educators says that Teach legal and ethical practice related to technology use is not necessary, 30.62% teacher educators says that Technology must be integrated with pedagogy is not necessary, 13.56% teacher educators says that Teachers need to 'learn by doing', become a network is not necessary, 42.63% teacher educators says that To increase the commitment of teachers in the creation of open educational resources (OER) with the use of information technology is not necessary, 23.64% teacher educators says that To encourage the teachers in critical thinking and creative problem solving through hands-on experimentation with ICT is not necessary.

Table 21: Six components of the ICT competency standards for teachers (ICT-CST) Framework of UNESCO

Components of the ICT-CST framework	Not Agreed		Slightly Agreed		Really Agreed	
	Freq.	%	Freq.	%	Freq.	%
Policy and Vision: technology literacy, knowledge dependency and knowledge creation in teacher education.	70	27.13%	56	21.70%	132	51.16%
Curriculum and assessment: basic knowledge, knowledge application and 21 st century skills.	57	22.09%	94	36.43%	107	41.47%



Pedagogy: integrate technology, complex problem solving and self management.	87	33.72%	93	36.04%	78	30.23%
ICT: basic tools, complex tools, pervasive tools.	52	20.15%	127	49.22%	79	30.62%
Organisation and administration: Standard classroom, collaborative groups and learning organisation.	78	30.23%	147	56.98%	33	12.79%
Teacher professional development: Digital literacy, manage and guide, teacher as model learner.	62	24.03%	89	34.50%	107	41.47%

The above table 21 shows that the Teacher educators agreed for the six components of the ICT competency standards for teachers (ICT-CST) framework of UNESCO for 51.16% Teacher educators really agreed for policy and vision- technology literacy, knowledge dependency and knowledge creation in teacher education, 41.47% Teacher educators really agreed for curriculum and assessment- basic knowledge, knowledge application and 21st century skills, 30.23% Teacher educators really agreed for pedagogy: integrate technology, complex problem solving and self management, 30.62% Teacher educators really agreed for ICT- basic tools, complex tools, pervasive tools, 12.79% Teacher educators really agreed for Organisation and administration- Standard classroom, collaborative groups and learning organisation and 41.47% Teacher educators really agreed for Teacher professional development- Digital literacy, manage and guide, teacher as model learner.

21.70% Teacher educators slightly agreed for policy and vision- technology literacy, knowledge dependency and knowledge creation in teacher education, 36.43% Teacher educators slightly agreed for curriculum and assessment- basic knowledge, knowledge application and 21st century skills, 36.04% Teacher educators slightly agreed for pedagogy: integrate technology, complex problem solving and self management, 49.22% Teacher educators slightly agreed for ICT- basic tools, complex tools, pervasive tools, 56.98% Teacher educators slightly agreed for Organisation and administration- Standard classroom, collaborative groups and learning organisation and 34.50% Teacher educators slightly agreed for Teacher professional development- Digital literacy, manage and guide, teacher as model learner.

27.13% Teacher educators not agreed for policy and vision- technology literacy, knowledge dependency and knowledge creation in teacher education, 22.09% Teacher educators not agreed for curriculum and assessment- basic knowledge, knowledge application and 21st century skills, 33.72% Teacher educators not agreed for pedagogy: integrate technology, complex problem solving and self management, 20.15% Teacher educators not agreed for ICT- basic tools, complex tools, pervasive tools, 30.23% Teacher educators not agreed for Organisation and administration- Standard classroom, collaborative groups and learning organisation and 24.03% Teacher educators not agreed for Teacher professional development- Digital literacy, manage and guide, teacher as model learner.



Table 22: ICT in teacher education clustered around the four competencies Teacher educators rank them in terms of the emphasis given to each.

Competencies	Not emphasised		Slightly emphasised		Really emphasised	
	Freq.	%	Freq.	%	Freq.	%
ICT skills and concepts.	78	30.23%	83	32.17%	97	37.60%
Use of ICT in planning, learning, teaching, assessment and evaluation.	85	32.94%	103	39.92%	70	27.13%
Collaboration and networking amongst teaching professional.	63	24.42%	98	37.98%	97	37.60%
Legal, social, ethical, human issues in ICT use.	91	35.27%	86	33.33%	81	31.40%

The above table 22 reveals that the ICT in teacher education clustered around the four competencies, teacher educators rank them in terms of the emphasis given to each as follows 37.60% teacher educators' really emphasised ICT skills and concepts in teacher education program, 27.13% teacher educators really emphasised use of ICT in planning, learning, teaching, assessment and evaluation in teacher education program, 37.60% teacher educators really emphasised Collaboration and networking amongst teaching professional in teacher education program and 31.40% teacher educators really emphasised Legal, social, ethical and human issues in ICT use in teacher education program.

The 32.17% teacher educators' Slightly emphasised ICT skills and concepts in teacher education program, 39.92% teacher educators Slightly emphasised use of ICT in planning, learning, teaching, assessment and evaluation in teacher education program, 37.98% teacher educators Slightly emphasised Collaboration and networking amongst teaching professional in teacher education program and 33.33% teacher educators Slightly emphasised Legal, social, ethical and human issues in ICT use in teacher education program.

The 30.23% teacher educators' not emphasised ICT skills and concepts in teacher education program, 32.94% teacher educators not emphasised use of ICT in planning, learning, teaching, assessment and evaluation in teacher education program, 24.42% teacher educators not emphasised Collaboration and networking amongst teaching professional in teacher education program and 35.27% teacher educators not emphasised Legal, social, ethical and human issues in ICT use in teacher education program.

Conclusion

ICTs in the education sector can be quite costly in terms of up-front costs (for acquiring basic infrastructure) and the recurrent costs (maintenance and human resources training and development). With this rise in implementation and demand comes an increased need to evaluate the effectiveness of ICT in teacher education. An evaluation of ICT-CFT use in education in



general and teacher education in particular will help us to learn from past experiences, improve service delivery, plan and allocate resources, evaluate policies and demonstrate results as part of accountability to key stakeholders. The competency framework for teachers was then used to evaluate information and communication technology (ICT) used in pre-service teacher education that is B.Ed. to enable the investigator to identify its strengths and weaknesses. The framework is then improved towards a new framework that can be effectively used to evaluate information and communication technology use in pre-service teacher education. In this study the independent variables are derived from computer use within the institution, some other extraneous factor may have impact on the results. Those factors may be computer use at home, friend's home and cyber or internet centers by the respondents. It is an attempt has been made to hold these extraneous variables, but it is very difficult to determine at what extent which affect the result.

References

- Amrita Virtual Interactive e-Learning World. Available at: <http://aview.in/>
- Bhattacharya, I. & Sharma, K. (2007). India in the knowledge economy an electronic paradigm, *International Journal of Educational Management* Vol. 21 No. 6, Pp. 543- 568
- Bloom, B. S. (1970). Toward a theory of testing which includes measurement - evaluation - assessment, in Wittrock, M. C. and Wiley, D. E. (ed), *The Evaluation of Instruction*, pp. 25–50. New York: Holt, Rinehart & Winston.
- Chandra, S. & Patkar, V. (2007). ICTS: A catalyst for enriching the learning process and library services in India, *The International Information & Library Review* Vol. 39, No. (1), Pp; 1-11
- Cholin, V. S. (2005). Study of the application of information technology for effective access to resources in Indian university libraries, *The International Information & Library Review* Vol. 37, No.(3), 189-197
- Consortium for Educational Communication. Available at: <http://cec.nic.in/Pages/Home.aspx>
- EFA. (2014). National University of Educational Planning and Administration, New Delhi. Available at: <http://mhrd.gov.in/sites/uploadfiles/mhrd/files/uploaddocument/EFA-Review-Report-final.pdf>
- e-PG Pathshala. Available at: <http://epgp.inflibnet.ac.in/about.php>
- Free and Open Source Software for Education. Available at: <http://fossee.in>
- Jhurreev, V. (2005). Technology Integration in Education in Developing Countries: Guidelines to Policy Makers. *International Education Journal*, 6(4):Pp467-483 Available: <http://ehlt.flinders.edu.au>
- Jo Shan Fu.(2013). ICT in Education: A Critical Literature Review and Its Implications. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 2013, Vol. 9, Issue 1, pp. 112-125



Jonassen, D. & Reeves, T. (1996). Learning with technology: Using computers as cognitive tools. In D. Jonassen (Ed.), Handbook of Research Educational on Educational Communications and Technology (pp 693-719). New York: Macmillan.

Jonassen, D. H. (1999). Computers as mind tools for schools: Engaging critical thinking (second Ed.). Englewood Cliffs, NJ: Prentice Hall.

Mason, R. (2000). 'From distance education to online education', The Internet and Higher Education Vol. 3No.(1-2), Pp; 63-74

McGorry, S. Y. (2002), 'Online, but on target? Internet-based MBA courses: A case study', The Internet and Higher Education Vol.5, No. (2), Pp; 167-175

Ministry of Human Resource Development. Available at: <http://mhrd.gov.in/technology-enabled-learning>

NME-ICT. Available at: <http://www.nmeict.ac.in/>

National Programme on Technology Enhanced Learning. Available at: <http://nptel.ac.in/>

Papanastasiou, E. C., & Angeli, C. (2008). Evaluating the Use of ICT in Education: Psychometric Properties of the Survey of Factors Affecting Teachers Teaching with Technology (SFA-T3). Educational Technology & Society, 11 (1), 69-86.

Mukherjee, P. (2012). President of India, Vision Statement for Teacher Education. Available at: http://www.teindia.nic.in/Files/Vision/TE_Vision-Statement-1Nov-12.pdf

Nickson, M. O. & Faith W. M. (2015). A Framework for Evaluating Ict Use in Teacher Education in Kenya, International Journal of Research, Vol.(2) 3, April 2015. Available at <http://internationaljournalofresearch.org/>

Rosemary, N. & Robert, O. (2013). A Monitoring and Evaluation Framework for the Integration of ICTs in Teaching and Learning in Primary Schools in Kenya, Journal of Education and Practice ISSN 2222-1735 Vol.4, No.12, 2013 available at: www.iiste.org

Sharma, R. (2003), 'Barriers in Using Technology for Education in Developing Countries', IEEE0-7803-7724-9103.Singapore schools', Computers & Education Vol .41, No.(1),Pp; 49--63.

Twining, P. (2002). Conceptualizing computer use in education: Introducing the Computer Practice Framework (CPF), British Educational Research Journal, 28(1): 95-110.

UNESCO (2002). Information and Communication Technology in Education–A Curriculum for Schools and Programme for Teacher Development. Paris: UNESCO.

UNESCO,(2002).Open And Distance Learning Trends, Policy And Strategy Considerations,14 UNESCO.

Wagner, D. A. et al. (2005). Monitoring and Evaluation of ICT in Education Projects: A Handbook for Developing Countries. Washington, DC: infoDev /World Bank. Available at: <http://www.infodev.org>