

# Assessment of the effectiveness of ICT on Teacher Trainees in Colleges of education. A Case of St. Monica's College of Education

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**Abstract:** The use of ICT in teacher training colleges has relatively improve teaching and learning. The effective use of various ICT tools such the computer, smart phones and PDAs has brought innovative ideas in teacher trainees. This study aimed at finding out the factors influencing the use of ICT tools in enhancing teaching and learning process in the various teacher training institutions in Ghana. A survey was used in order to investigate the study. It was revealed from the findings of the study that students and tutors in the various colleges of education have now accepted the use of ICT in teaching and learning process. However some students still see ICT as difficult due to various factors such as inadequate computers in the various colleges for practical tution and poor access to the internet for learning.

**Keywords:** ICT, Teaching-Learning, College of Education, Teacher Trainees.

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## 1. INTRODUCTION

In Ghana teachers are indispensable since most teachers are used in various community and national duties apart from their work as teachers in the classrooms. Teachers are used as pooling agents and constituency electoral managers during elections and other various national activities. This has brought the need of teachers to be trained in the use of ICT in order for them to acquire the necessary skills and knowledge adequately to carry out their teaching jobs and other professional duties.

Amedeker (2005), said that inadequate teacher preparation programmes results in the ability of most teachers to demonstrate adequate knowledge and understanding of the structure, functions and development of their discipline. The quality of teachers is a key predicator of students learning (Olulube, 2005). ICT is therefore an adequate tool or facility that can facilitate teacher training and help enhance student learning (UNESCO, 2002).

Hadad and Draxier (2006) claim that ICT do make valuable contributions to educational development and effective learning by expanding access, promoting efficiency, improving quality of learning, enhancing the quality of teaching and improving management system.

## STATEMENT OF THE PROBLEM

The effort of the Ghanaian government to establish effective Information and Communication Technology in the senior high schools as well as the teacher training institutions has prove futile due to inadequate ICT infrastructures in teacher education programmes. Due to this, most teachers in Ghana find it very difficult to use the various ICT tools in the classrooms as well as distance learning centres to improve teaching and learning. Therefore this study aims at how ICT tools could be used in colleges of education to improve teaching and learning and thereby extending its effects on the basic school pupils these trainees will end up teaching after graduation.

In order to achieve this broad objective, the following specific objectives will be considered;

- Ascertain the various ICT tools that could be used in teacher training institutions and its impact on teaching and learning.
- Investigate the need for tutors in various colleges of education to use ICT tools in their teaching and learning process.

### RESEARCH QUESTIONS

The research is guided by the following questions:

- What relationship exist between ICT and Information for teaching?
- How does ICT improve classroom teaching and learning process?
- Can the use of ICT improve the performance of teacher trainees when they are posted to the field?

### JUSTIFICATION/SIGNIFICANCE

Most teachers want to learn to use educational technology effectively, but they lack the conceptual framework, time, computer access, and support necessary to do so. If students could learn independently how to use technology to enhance their learning and skills development, with no involvement from their teachers, they are highly unlikely to have those opportunities if teachers do not let them have access to technology.

Miller, Martineau, and Clark (2000) recognize that technology-based teaching may not be essential in all classes but generally it is most facilitative as a result of providing relevant examples and demonstrations; changing the orientation of the classroom; preparing students for employment; increasing flexibility of delivery; increasing access; and satisfying public demands for efficiency. Therefore the findings of this research will intern to help the National Tertiary Council (NTC) and the Ghana Education Service (GES) to design technology based curriculum and syllabai for the various basic and second cycle institutions. The study will also help tutors in the various colleges of education to understand the need to abrest themselves with current technological knowledge and skills to demonstrate in their lesson delivery.

## 2. REVIEW OF RELATED LITERATURE

Experience around the globe in developing an information-based countries has shown that teacher training in the use and application of technology is the key determining factor for improving student performance in terms of both knowledge acquisition and skills development enabled by technology. Educational technology is not, and never will be, transformative on its own but requires teachers who can integrate technology into the curriculum and use it to improve student learning. In other words, computers cannot replace teachers. Teachers are the key to whether technology is used appropriately and effectively (Sam Calson 2002)

### *ICT Tools used in Teaching and Learning process*

- Internet connected Computers
- Mobile phone
- Television
- Land line phones
- Calculators
- etc

### *Importance of using ict tools in lesson delivery*

Various studies agree that the use of ICT tools in teaching-learning process is essential in developing self-based learning and enhancing speedy understanding of lessons. Acoording to Yelland (2001), “traditional educational environments do not seem to be suitable for preparing learners to function or be productive in the workplaces of today's society”. She claimed that organizations that do not incorporate the use of new technologies in institutions cannot seriously claim to prepare their students for life in the twenty-first century. This agument was supported by Murray (2003), who posited that economic forecasts and business analysts predict that the 21st century jobs will require information processing skills. Development of information literacy, therefore, becomes inevitable for workers of the future. This has made the use of ICT in the teaching-learning process more important in the various colleges of education in Ghana.

Miller et al (2000) opine that "The whole purpose of using technology in teaching is to give better value to students" This better value should also impact the learners/students' performance. (Louw, Mullar and Tradaux 2008), argue that ICT holds much promise for use in curriculum delivery. Thus, technology can effectively improve teaching and learning abilities, hence increasing learners' performances.

ICT should be involved in the process of teaching in every subject and in every classroom, because of the very fact that ICT facilitates students' engagement in problem solving activities; decision-making to improve their thinking skills (Grabe 2001). Moreover, effective use of ICT can facilitate student-centered active learning (Ellis et al. 2008), engage students in collaborative learning as well as enhance their social interaction (Dodge, Colker & Heroman 2003), improve their cognitive development, increase creativity, and improve their problem solving skills (khan, Hasan & Clement 2012).

### ***Factors influencing the use of ICT tools in teaching and learning***

Several factors influence the use of Information and Communication Technology tools to enhance effective teaching and learning in teacher training institutions.

Rogers (2003) identified five technological characteristics or attributes that influence the decision to adopt an innovation. Stockdill and Morehouse (1992) also identified user characteristics, content characteristics, technological considerations, and organizational capacity as factors influencing ICT adoption and integration into teaching.

Charles (2012) also identified several factors that influence the use of ICT to make teaching-learning effective which include: self-efficacy, computer motivation, computer attitudes, the attitude-behaviour relation, technology integration, constructivist beliefs, ICT motivation, attitudes towards ICT in education, organization of learning, organizational climate, infrastructure and resources, teachers' educational beliefs, perceptions on ICT-related school policies, teachers' individual background, gender, teaching experience, professional development, teachers' attitudinal factors, innovativeness, technology self-efficacy (technology competence), attitude toward computers in education, socio-organizational factor, school culture, administrative support, school support, pressure to use technology, age etc.

### ***The challenges facing the use of ICT tools in teaching and learning***

According to Martin Mungai (2011) the following underlisted challenges inhibit the effective use of ICT tools and most especially computers in developing countries such as Ghana to enhance effective teaching-learning process.

1. **Lack of qualified teachers to teach ICT in schools;** The demand for ICT learning has been tremendous and the number of teachers who are trained to teach ICT cannot meet the demand. There are more students willing to be taught computing skills than there are teachers to transfer the skills.
2. **Inadequate computers in schools;** Computers are still very expensive and despite spirited efforts by the government agencies, NGO, corporate organizations and individuals to donate computers to as many schools as possible, there still remains a big percentage of the schools unable to purchase computers for use by their pupils.
3. **Lack of electricity;** Many schools are still not yet connected to electricity; Ghana being a developing country, the government has not been able to connect all parts of the country to the national electricity grid. Consequently those schools that fall under such areas are left handicapped and may not be able to offer computer studies.
4. **Computers are still expensive in Ghana,** majority of the individuals and schools cannot afford to buy a computer and consider it as a luxury item, more expensive than a TV. While 2nd hand computers cost as little as \$150 and branded new computers being sold at \$500 or higher.
5. **Broken down computers;** while a good number of schools have benefited from donated used computers, they have not been adequately equipped with the same on maintenance and repair, hence it's very common to see a school's computer lab full of broken down computers, some repairable and some not. This has actually been a major problem, and the government has now put strict measures on any person, NGO or corporate bodies willing to donate 2nd hand computers. (It is seen as a dumping ground); e-waste management.
6. **Burglary;** the fact that computers are still very expensive in Ghana, makes them a target for thieves who usually have ready markets to another party at a much less figure. This has made many schools to incur extra expenses trying to burglar proof the computer rooms.

7. **Fear by the administration;** there is still a strong perception especially by the older generation that computers require highly skilled personnel to operate them, while this may not be the case, some school administrators also fear that their students will be exposed to adult sites and other undesired sites, through the use of the internet. Some also fear the infection of viruses to their computers leading to data loss, while this may be true to some extent, proper education on the safe use of computers and help alleviate some of this fears.

8. **Fear by the teacher,** the teacher may fear being rendered irrelevant by the introduction of computers in his/her class. The 'feel' that the teacher still remains an authority and a 'know it all' in class is something that most teachers cherish, and anything that makes them otherwise is deemed an enemy of the classroom.

9. **Lack of internet or slow connectivity;** most schools are not able to connect to the world wide web, due to the high costs involved in the connectivity. On average, it may cost approximately \$120 per month to connect to about 15 computers on a bandwidth of 128/64kbps. This is considered as very expensive for a very slow speed.

10. **Obsolete computers** lower the morale of both the teacher and the student; it is very common to find some schools using very old computers running on win98 or win 95.

### 3. METHODOLOGY

#### *Research Participants and Instrument*

Descriptive method and quantitative analysis of data were used in the study. The target sample of the study was 243 college of education students. The sample was selected using stratified random sampling technique from three selected College of education institutions in Ghana. A questionnaire was designed and distributed to respondents to complete. The questionnaire contained statements that enabled the respondents to provide answer to how they agree or disagree to the statements (i.e. Strongly Agree, Agree, Neutral and Disagree). A few contained the questions regarding opinions of the respondents on the factors influencing the use of ICT to make teaching-learning effective in college of education institutions in Ghana.

#### DATA ANALYSIS

After data collection stage, all the structured items of the questionnaires were keyed into the computer and were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.

### 4. ANALYSIS OF RESULTS

#### Demographic Data

The demographic data involved the background of respondents ( age, gender, marital status, and level of respondents).

**Table 1: Background of Respondents**

Variables	Frequency (N=243)	Percentage (%)
<b>Age of respondents</b>		
15-20	14	5.8
21-26	222	91.4
27-35	7	2.9
Total	243	100
<b>Gender</b>		
Male	114	46.9
Female	129	53.1
<b>Marital status</b>		
Married	5	2.1
Single	238	97.9
<b>Level</b>		
100	61	25.1
200	61	25.1
300	60	24.7
	61	25.1

**Effectiveness of ICT on teacher training students**

**Table 2: Effectiveness of ICT on teacher training students**

Variables	Frequency (N=243)	Percentage (%)
<b>ICT reduce cost (traveling and Labor) cost</b>		
Strongly agree		
Agree	150	61.7
Neutral	70	28.8
Total	23	9.5
<b>ICT save time as compared to the traditional method of teaching</b>		
Strongly agree	126	51.9
Agree	100	41.2
Neutral	17	6.9
Total	243	100
<b>ICT reduces instructors talking time during teaching.</b>		
Strongly agree	77	31.5
Agree	136	56.0
Neutral	30	12.3
Total	243	100
<b>ICT makes sharing of vital information faster</b>		
Strongly agree	158	64.2
Agree	86	35.4
Neutral	1	0.4
Total	243	100
<b>Assess to learning materials is easier and faster with ICT tools as compared to the traditional method</b>		
Strongly agree	202	83.1
Agree	40	16.5
Neutral	1	0.4
Total	243	100

**Field Survey, 2019**

The table above reveals that 61.7% of the total respondent indicated they strongly agree that ICT reduces travelling and labor cost, 28.8% of the total respondent indicated they agree, 9.5% indicated neutral. 51.9% of the total respondents indicated they strongly agree that using ICT in teaching and learning save time as compared to the traditional method. Also 41.2% of the total respondent indicated they agree, 6.9% indicated neutral. 31.5% of the total respondents indicated they strongly agree that ICT in teaching reduces instructor's talking time. Again 56.0% of the total respondent indicated they agree, 12.3% indicated neutral. 64.2% of the total respondent indicated they strongly agreed that ICT promote effective sharing of vital information as compared to the traditional method, 35.4% of the total respondents indicated they agree, 0.4% indicated neutral. Lastly, 83.1% of the total respondents indicated they strongly agree that assess to learning materials is easier and faster with ICT tools as compared to the traditional method, 16.5% of the total respondent indicated they agree, 0.4% indicated neutral. In view of this ICT is very effective on teacher training students. This finding was similar to the study by Gibbons and Fairweather (2000) as they indicated that on the basis of sophisticated cost analysis, the use of ICT tools in teaching and learning can result in significant cost savings, sometimes as much as 50%, compared with traditional instructor-led learning.

**Impact of ICT on Teaching and Learning Process**

**Table 3: Impact of ICT on learners**

Variables	Frequency (N=243)	Percentage (%)
<b>Using ICT improves students learning outcome</b>		
Strongly agree	99	40.7
Agree	105	43.2
Neutral	38	15.6
Disagree	1	0.4
Total	243	100
<b>Students establish a better communication with their colleagues using ICT tools such computer, smart phones etc and services like chat, mail, discussion forum, whiteboard etc.</b>		
Strongly agree	91	37.4
Agree	126	51.9
Neutral	25	10.3
Disagree	1	0.4
Total	243	100
<b>Students learn best using ICT improved e-learning tools like Google, Wikipedia, yahoo, etc.</b>		
Strongly agree	88	36.2
Agree	115	47.3
Neutral	39	16.0
Disagree	1	0.4
Total	243	100
<b>ICT provides the learning resources students need.</b>		
Strongly agree	75	30.9
Agree	134	55.1
Neutral	32	13.2
Disagree	2	0.8
Total	243	100
<b>ICT is useful in reaching students' goals.</b>		
Strongly agree	77	31.7
Agree	136	56.0
Neutral	30	12.3
Total	243	100

**Field Survey, 2019**

From table 3 it reveals that 40.7% of the total respondent indicated they strongly agree that, using ICT improves students learning outcome, 43.2% of the total respondent indicated they agree, 15.6% indicated neutral and 0.4% respondent indicated disagree. Also, 37.4% of the total respondent indicated they strongly agree that they can establish a better communication with colleagues using ICT tools and services like chat, E-mail, discussion forums, whiteboard etc. 51.9% of the total respondent indicated they agree, 10.3% indicated neutral while 0.4% of the respondents indicated that they disagree. Again 36.2% of the total respondent indicated they strongly agreed they learn best using online ICT services like Google, Wikipedia, yahoo, etc. 47.3% of the total respondent indicated they agree, 16.0% indicated neutral and 0.4% respondents indicated they disagree. 30.9% of the total respondents indicated they strongly agreed that ICT help provide the learning resources they need for teaching and learning, 55.1% of the total respondent indicated they agree, 13.2% indicated neutral and 0.8% respondent indicated that they disagree. 39.1% of the total respondent indicated they strongly agreed that they now have necessary information technology skills to easily operate the ICT and e-learning tools, 44.0%

of the total respondent indicated they agree, 13.2% indicated neutral and 3.7% respondent indicated disagree. Lastly, 31.7% of the total respondent indicated they strongly agree that ICT is useful in reaching their goals, 56.0% of the total respondent indicated they agree, 12.3% indicated neutral. This findings is similar to (Chodorow, 1996) which says Learners have control over the content, learning sequence, pace of learning, time, and, media, which allows them to tailor their experience to meet personal learning objectives

## 5. CONCLUSION

The findings from the analysis for ICT use in teacher education programs in Ghana and the effectiveness of teachers showed that there is a significant relationship between the poor provision and uses of ICT instructional materials during teacher training. The implication is that respondents were not satisfied with the level of weak integration of ICT into teacher education programs because most teachers do not have the required skills and knowledge to effectively carry out their teaching assignments. This is so because of the slow access to basic ICT equipment, low Internet connectivity and the inadequacies in the use of audio-visual materials and equipments in teacher education programs are barriers to the effective and professional development of teachers in Ghana (c.f., Ololube, 2006).

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