

Challenges Facing the Integration of Information Communication and Technology in Teacher Education: A Case of Moi Teachers' Training College - Baringo, Kenya

Sempele, N. L. Catherine
University of Eldoret
sempnaire@gmail.com

Akim, L. Louis
Moi TTC Baringo
loababu@gmail.com

Karei, L. Racheal
University of Eldoret

Abstract

The use of ICT in virtually every aspect of life today has made the computer an indispensable tool in the world. However, many teacher educators in Kenya are still not conversant with even the simple day-to-day computer operations. Kenya plans to achieve newly industrialized status by the year 2020 and to do so most of its citizenry needs to be computer literate. The study looked at the challenges facing the integration of ICT in teacher education at Moi Teachers' Training College – Baringo, Kenya. The objectives of the study were to investigate the need for ICT at the college, the availability of ICT facilities and to establish the frequency of use of ICT facilities by teacher educators during classroom instruction. This was meant to establish the possible reasons for slow integration of ICT in training by teacher educators at the college and thus offer possible recommendations aimed at improving ICT integration in teacher training. The research was a descriptive survey study. The researchers purposively selected all 38 members of the teaching staff as participants because they possessed the required information. Self administered questionnaires were used to collect data from the respondents. Descriptive statistics was used to analyze the data. Frequency and percentage tables were generated from these summaries for ease in comprehension and interpretation. The study established that more than half of the trainers have not been trained on ICT with the majority citing this as the main hindrance to effective integration of ICT in teacher education. The mobile phone was the most popular ICT facility for the trainers. The correlation analysis established no significant relationship between the availability of ICT resources and frequency of their use in classroom instruction. The researchers recommend that teacher trainers in colleges be trained on ICT use.

Keywords: *ICT, Integration, Teacher Education*

Introduction

According to the Kenya Sessional Paper No 1 of 2005 (Republic of Kenya, 2005), Information and Communication Technology (ICT) has a direct role to play in education and if appropriately used, it can bring many benefits to the classroom in particular and the education and training process in general. It provides new opportunities for teaching and learning, including offering opportunities for more student-centered teaching, opportunity to reach more learners, greater opportunity for teacher-to-teacher, and student-to-student communication and collaboration, greater opportunities for multiple technologies delivered by teachers, creating greater enthusiasm for learning amongst students and offering access to a wider range of courses (Drent & Meelissen, 2008). However, many teacher educators in Kenya are still not conversant with even the simple day-to-day computer operations. Kenya plans to achieve newly industrialized status by the year 2020, besides the introduction of laptops in all public primary schools starting early 2014. To achieve this, most of its citizenry need to be computer literate.

Anxiety, lack of confidence and competence imply that ICT is not given priority when it comes to conventional learning mechanisms (Russel & Bradley, 1997). In response to these challenges, the Ministry of Education (MOE) with support of the United States Agency for International Development (USAID) initiated the Teacher Education and Professional Development (TEPD) programme. The overall goal of TEPD is to improve the practices and competencies of teachers in Kenya. Among the key components of this intervention is pre and in-service primary teacher education that includes training on basic ICT skills. Towards this end, TEPD has partnered with computers for schools Kenya (CFSK), a local Non-governmental Organization (NGO) that conducts the training. CFSK started by training 16 principals in the User Proficiency Course (UPC) in August 2008. This was followed by training of 2 ICT lecturers from each teacher training college (TTC) on a Hardware Maintenance Course and later the teacher educators from the various teacher training colleges (TTCs).

Despite all these efforts by the government, only 7% teacher educators in Moi Baringo TTC have made an effort to facilitate their lessons using ICT. Some did not attend the training whereas others were just not interested. It is in this regard that the researchers sought to establish the current status of ICT integration in teacher training aimed at improving the quality of services offered by the college. This would go a long way in ensuring the college achieves its mission of training and producing competent teachers who are positively responsive to their learners and professional demands in Kenya and the African region.

According to Chen (2008), teachers' integration of ICT into teaching is influenced by various factors such as attitudes towards technology besides the individual and organizational setup. Hence, the objectives of this study were to; investigate the need for ICT at the college, investigate the availability of ICT facilities in the college, establish the frequency of use of ICT facilities by teacher educators during training, establish reasons hampering effective integration of ICT in teacher education and suggest possible solutions for the improvement of ICT integration in teacher education.

Materials and Methods

This was a descriptive survey study aimed at investigating the challenges facing the integration of ICT in teacher education at Moi TTC Baringo. According to Mugenda and Mugenda (2003), this kind of research allows for use of members of a population in collecting data that may be used in determining the current status of that population with respect to one or more variables. The study was conducted at Moi TTC Baringo, one of the 23 public primary teacher training colleges in Kenya. The teaching staff comprised 32 males and 6 females giving a total of 38. The target population comprised teacher educators in public teacher training colleges. The accessible population comprised the 38 members of the teaching staff at the college.

The researchers purposively selected all 38 members of the teaching staff as participants. According to Mugenda and Mugenda (2003), a sample as big as possible in any research is recommended because researchers can be confident that if another sample were to be selected from the same population, then the findings from the two samples would be similar to a high degree. Purposive sampling technique was deemed suitable because it ensured that those selected for study possessed the required information (Kothari, 2004).

Self-administered questionnaires were used to collect data from the respondents. They had both open- and closed-ended items to allow for in-depth collection of information based on the objectives of the study. Questionnaires were used because they offer a fast method of collecting plenty of data and especially if a good number are returned (Gay, Mills & Airasian, 2005). The open-ended questions required the respondents to provide information pertaining to their demography while the closed ended questions based on a 5-point Likert scale required them to circle either strongly agree (SA = 5), agree (A = 4), remain neutral (N = 3), disagree (DA = 2) or strongly disagree (SD = 1) in relation to the attributes stipulated. The independent variables were perceptions towards the need, access and frequency of use of ICT facilities by the teacher educators, while the dependent variable was the degree of integration of ICT in teacher education. The control variable for this study was the teacher educators specifically trainers at Moi TTC - Baringo.

A pilot study was carried out among 4 teacher educators from a sister college (Tambach TTC) in the same zone to establish the validity of the research instrument and thereby seek suggestions on how to improve it. According to Mugenda and Mugenda (2003), a sample of between 1% and 10% is considered appropriate for any pilot study. This number (4) represented 10% of the teacher educators in the study sample. Mugenda and Mugenda (2003) recommend pre-testing of research instruments so as to determine the expected non-response rate, the suitability of the chosen method of data collection and the adequacy of the instruments in providing the exact data it is intended to. The researchers constructed the questionnaire and then reviewed the tool in a panel meeting that included some co-opted members in order to ensure that it was valid for data collection.

Questionnaires were issued out by the researchers to the sampled respondents who were given two days to respond to the items therein. Out of the total 38 questionnaires issued out, 32 (84%) were collected back for analysis. Qualitative data derived from the open-ended questions was categorized into themes while the quantitative data was assigned numerical values for analysis. The Statistical Package for Social Sciences (SPSS) computer program was then used to analyze the quantitative data. The attitude scale responses were scored in such a way that the SA and A responses earned 5 and 4 points respectively with D and SD earning 2 and 1 points respectively. Neutral responses scored 3 points. Frequency and percentage tables were generated from these summaries for ease in comprehension and interpretation and to facilitate the generation of inferences. Understandably, individuals tend to get concerned about granting access to researchers. When it is granted, the researcher has to prove the research poses no danger to the respondents. This study took note of this implicit during the data collection process. The researchers assured the respondents that the information gathered would be used for the current study only and that confidentiality was guaranteed.

Results

Information in Table 1 shows how the respondents were distributed. Based on the sampled (N = 32) respondents, 81% (n = 26) were male and 19% (n = 6) were female. Thirty-one per cent were aged

between 30 and 39 years, 36% aged between 40 and 49 while the other 32% were aged above 50 years. A majority of the respondents (50%) had a Bachelor's degree, 18% had a diploma and 27% had Master's while 5% did not respond to this item of the questionnaire. Furthermore, 50% of the participants had been training teachers for between 10 and 20 years with only 9% having practiced as teacher trainers for less than 10 years.

Table 1. Teacher trainers' gender, age and levels of education

Gender	Number of trainers (f)	Percentage (%)
Male	26	81
Female	06	19
Total	32	100
Age		
Between 30 – 39 years	10	32
Between 40 – 49 years	12	36
Above 50 years	10	32
Total	32	100
Level of education		
Diploma	06	18
Bachelors	16	50
Master	07	27
No answer	01	5
Total	32	100
Professional experience		
Below 10 years	03	09
Between 10 and 20 years	16	50
Between 20 and 30 years	10	32
Over 30 years	03	09
Total	32	100

N = 32

Trainers' Responses on their Competencies in Basic ICT Skills

From the data collected, it was evident that more than half, 55% (n = 18), of the trainers had not been trained on ICT with only 45% (n = 14) having undertaken a course in ICT. Among those trained in ICT, only 21% (n = 3) had trained at the diploma level while the other 76% (n = 11) only trained at certificate level. Those who had had no training in ICT at all gave the following reasons: 'lacked interest', 5% (n = 9); 'limited opportunities for training', 23% (n = 4), and 'limited time for training', 55% (n = 10). The remaining 17% gave no reason for not having trained on basic ICT skills.

Trainers Responses on the most Commonly used ICT Facilities

The mobile phone was the most commonly used ICT facility to 37% (n = 12) of the teacher trainers. All trainers preferred to use their mobile phones compared to all other ICT facilities available. The radio and the television came in second and third respectively. This may be attributed to the fact that these facilities are the most easily and readily available to the participants.

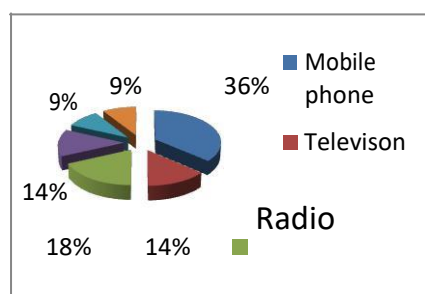


Figure 1. Most commonly used ICT facilities

Respondents' Perceptions of the Need for ICT in Teacher Education

Most of the respondents (over 85%) agreed with the five attributes on the need for ICT in teacher education (Table 2). Only 5% of the respondents disagreed with the attribute 'ICT helps teachers meet

deadlines'. All respondents agreed that ICT helps trainers save time apart from also simplifying the teaching process.

Table 2. Respondents' perceptions of the need for ICT in teacher training

The need for ICT	(%) Distribution of respondents					
	SD	D	UD	A	SA	Total
ICT is necessary in time saving	00	00	00	27	73	100
ICT simplifies the teaching process	00	00	00	46	54	100
ICT makes teaching enjoyable	00	00	05	41	54	100
ICT helps teachers meet deadlines	00	05	09	36	50	100
ICT helps teachers develop professionally	00	00	14	50	36	100

N = 32

SD = Strongly disagree; D = Disagree; UD = Un Decided; A = Agree and SA = Strongly disagree

Respondents' Perceptions of the Availability of ICT Facilities in the College

From the information presented in Table 3, it is apparent that a good percentage (5% agree and 55%) of the respondents strongly agreed that they had enough computers in their various departments. This implies that the college has availed adequate computers for use by the teaching staff. However, other problems may have hindered the use of these computers in teacher training. Sixty-four per cent of the trainers felt that computers were not easily accessible to them while another 64% felt that the computers are not always in good working condition. Other obstacles highlighted included lack of internet, poor connectivity and the fact that offices were not networked; all being important factors in facilitating the integration of ICT in teacher education.

Table 3. Respondents' perceptions of the availability of ICT facilities

Availability of ICT facilities	(%) Distribution of respondents					
	SD	D	UD	A	SA	Total
We have enough computers in the various departments	05	27	08	55	05	100
The computers are accessible to all for use	14	50	13	18	05	100
The computers are always in good working condition	23	41	22	14	00	100
There is good internet connectivity in the college	91	09	00	00	00	100
The different offices are adequately networked	82	14	04	00	00	100

N = 22

NT = Not true and T = True

Respondents' Perceptions of the use of ICT in Teaching

The results presented in Table 4 indicate that ICT facilities are rarely used by teacher trainers in teacher education at the college level. Fifty-nine per cent did not use ICT to prepare professional documents; 86% did not use ICT to teach while 68% do not use ICT to analyze raw scores obtained from the examinations given out to teacher trainees. On the contrary, 59% of the teacher trainers agreed that they use ICT to seek further knowledge or as a source of reference.

Table 4. Respondents' perceptions of the frequency of use of ICT facilities

The frequency of use of ICT facilities	(%) Distribution of respondents					
	SD	D	UD	A	SA	Total
I use ICT to prepare my professional documents	09	50	04	23	14	100
I use ICT to teach my lessons	27	59	05	05	04	100
I use ICT to analyze raw scores	23	45	09	23	00	100
I use ICT to seek further knowledge/as a source of reference	09	14	18	46	13	100
I use ICT to share information with colleagues	27	28	09	36	00	100

N = 22

NT = Not true and T = True

Hindrances and Possible Solutions to Effective Integration of ICT in Teacher Education

Most of the participants (56%) gave lack of basic ICT skills as their main hindrance to effective integration of ICT in teacher training. Inadequate computers and lack of internet connectivity were rated

as second and third hindrances respectively (Fig 2). Of the possible solutions given, 'train the teaching staff' was the most popular response from 32% of the respondents while 23% suggested the need for internet connectivity and another 18% felt that computers should be made accessible and be well maintained.

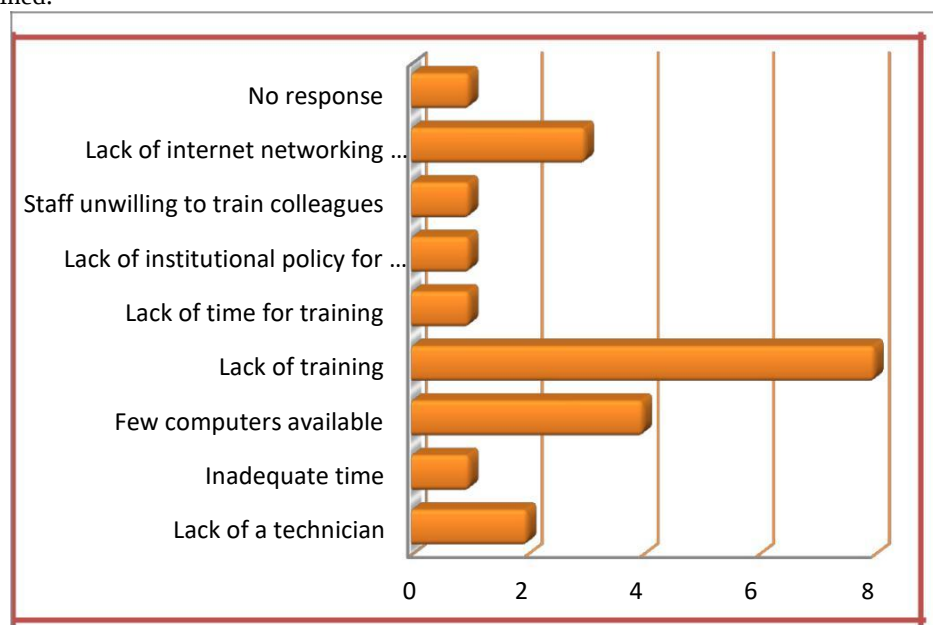


Figure 2. Reason for hindrance to ICT integration

Discussion

The Need for ICT in Teacher Education

More than 85% of the respondents agreed that there is need for ICT integration in teacher training similar to the recommendations by Drent and Meelissen, (2008) that student-oriented pedagogical approaches and computer experience have a direct positive influence on ICT integration by teachers. However, the study established no significant correlation ($r = -0.253$) at $p < 0.05$ between the tutors level of education and the use of ICT in teacher training although all respondents agreed that ICT helps trainers save time apart from simplifying the teaching process. This may be attributed to the small sample size.

Most commonly used ICT Facilities

Baskin and Williams (2006) describe ICT integration as a means of using any ICT tool to assist in the teaching and learning process. According to the findings of the study, mobile phones are the most commonly used ICT facilities followed by the radio, television, computers and cameras in that order. Participants agreed that these facilities are used in one way or the other to boost teaching. Some of the reasons given for use of such facilities in the teaching and learning process include 'it simplifies teaching', 'makes teaching enjoyable', 'helps trainers save a lot of time' amongst others. The use of ICT in teaching would indeed save a lot of time in record keeping, results analysis and notes keeping.

Availability of ICT Facilities in Colleges

Access to ICT infrastructure and resources in schools is a necessary condition to the integration of ICT in education (Plomp, Anderson, Law & Quale, 2009). A majority of the respondents in the study felt that the college has made an effort to supply computers for the various departments in the college. This is in line with the recommendations given by Norris, Poirot and Soloway (2003) that access to technology is crucial for its enhanced use in teaching. However, there is still a problem with the accessibility and maintenance of the computers with the major hindrance being lack of internet connectivity. In fact, the correlation analysis yielded no significant relationship ($r = 0.014$) at $p < 0.05$ between the availability of ICT resources and their use in classroom instruction. This has rendered the use of ICT in teaching almost impossible with a majority of the trainers using it mainly to seek further knowledge. Hence, institutions need to seek ways of ensuring that there is technical support available in case of any breakdown of these ICT facilities.

Use of ICT in Teaching

Less than 40% of the trainers in the study area use ICT for teaching. According to Baek, Jong and Kim, (2008), teachers' computer competence is a major predictor of ICT integration in teaching. Further, Jones (2004) observes that teachers feel reluctant to use the computer if they are not confident

due to lack of ICT knowledge. Based on the findings of the study, more than half of the teacher trainers have not received any training in ICT. Those who have been trained have attained mainly a certificate with only a few training at the diploma level. Further, the percentage of the tutors who have some training in ICT does not include many of the teachers with over 20 years of teaching experience similar to findings by Baek, Jong and Kim (2008) who established that the experienced teachers were less willing to integrate ICT in their teaching. The reasons given for not training in ICT include lack of opportunities and inadequate time to undergo training. These reasons are in agreement with findings of Fullan (2003), who recommended that in order for teachers to implement new initiatives such as the integration of ICT in the teaching process, it is necessary to reduce their workload.

Hindrances and Possible Solutions to Effective Integration of ICT in Teacher Education

Some of the main hindrances to effective ICT integration in training mentioned were lack of training and lack of a technician who should be in charge of servicing and maintaining the college computers. According to Jones (2004), the breakdown of computers causes interruptions and if technical assistance is lacking, then it is likely to lead to lack of ICT integration in teaching. Other hindrances mentioned include 'lack of an institutional policy on ICT integration', 'lack of time for training and integrating' and 'lack of internet connectivity'. According to Chen (2008), access to appropriate technology means that its affordability and constraints need to be carefully considered when the tool is incorporated in the teaching process for it to be successful. This therefore means that besides educational institutions ensuring the availability of ICT facilities, they should also ensure that they can be easily accessed by the majority and that they are always in good working condition for use.

Conclusions

The significance of ICT in today's life cannot be over emphasized. The education sector is slowly embracing ICT in its daily operations. This should not leave behind the teacher training colleges given the fact that this sector is the main source of primary school teachers who will be obligated with the duty of teaching the primary school pupils using modern technology. If they themselves are not confident and equipped with appropriate basic ICT skills for integration, then the whole program is bound to collapse. The government should thus focus on first offering refresher courses on basic ICT skills to teacher educators who would then integrate ICT in the course of their teacher training. This will in turn force teacher trainees to emulate their trainers on ICT use and hence teach at the primary school level using the ICT facilities available. This will in turn ensure a smooth and successful integration of ICT in the teaching process in the country as a whole. Most importantly, institutions of learning should develop a policy on ICT integration at their various levels of operation. Last but not least, institutions should strive to improve on their curriculum based establishment which will in turn boost the availability of ample time required for the preparation and implementation of ICT integrated lessons.

References

- Baek, Y., G., Jong, J., & Kim, B. (2008). What makes teachers use technology in the classroom? Exploring the factors affecting facilitation of technology. *Computers and Education*, 50(8), 224-234.
- Baskin, C., & Williams, M. (2006). ICT integration in schools. Where are we now and what comes next? *Australasian Journal of Educational Technology*, 22(4), 455-473.
- Chen, C. H. (2008). Why do teachers not practice what they believe regarding technology integration? *The Journal of Educational Research*, 102(1), 65-75.
- Drent, M., & Meelissen, M. (2008). Which factors obstruct or stimulate teacher educators to use ICT innovatively? *Computers & Education*, 51(1), 187-199.
- Fullan, M. (2003). *The moral imperative of school leadership*. Thousand Oaks, Corwin CA.
- Gay, L., R., Mills, E. G., & Airasian, P. W. (2005). *Educational Research: Competencies for Analysis and Application*. New Jersey: Prentice Hall.
- Jones, C. A. (2004). A review of the Research Literature on Barriers to the Uptake of ICT by Teachers. *British Educational Communications and Technology Agency*. Retrieved from <http://www.becta.org.uk>
- Kothari, C. R. (2004). *Research Methodology*. New Delhi: Willy Eastern Limited.
- Mugenda, O., & Mugenda, G. (2003). *Research Methods*. Nairobi, Kenya: African Centre for Technology Studies.
- Norris, C., Sullivan, P., Poirot, J., & Soloway, E. (2003). No access, no use, no impact: Snapshot surveys of educational technology in K-12. *Journal of Research on Technology in Education*, 36(1), 15-27.
- Plomp, T., Aderson, R., Law, E. & Quale, A. (2009). *Cross-national information and Communication Technology.: Policies and Practices in Education*. Information Age Publishing Charlotte, N.C.
- Russell, G., & Bradley, G. (1997). Teachers' computer anxiety: Implications for professional development. *Education and Information Technologies*, (2)17-30. Nairobi, Kenya: Technology Studies.