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The Influence of Trainee Teachers' Gender on Integration of ICT into Future Teaching Practices, in Rift Valley, Kenya

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Abstract:

This study sought to determine the Influence of Trainee Teachers' Gender on Integration of ICT into future Teaching Practices in Rift Valley Kenya. The study employed correlation research design. The researcher purposely selected five public TTCs in former Rift Valley Province for the study. Stratified simple random sampling was used to select a total of 357 participants. Data was collected from trainee teachers in five TTCs, using a teacher trainee questionnaire. Descriptive statistics and inferential statistics were employed to analyze quantitative data. The descriptive statistics involved the use of frequencies, means and standard deviation, while the inferential statistics was Pearson Product Moment Correlation Coefficient. Data was presented in form of texts and tables. The findings showed that trainee teacher gender had no significant influence on ICT integration in teaching and learning at 0.05 level of significance.

Keywords: Teacher Trainee, Gender, integration of ICT, future training practices

1. Introduction

Information and Communication Technology (ICT) is one of the principal drivers of economic development and social change worldwide. Torero and Braun (2006) offered a broad definition of ICT which encompasses equipment and services. For them, ICT includes the computing industry (hardware, software, networks, the Internet, and related services); electronic data processing and display (such as photocopiers, cash registers, calculators, and scanners, as well as a myriad of less well-known machines specifically tailored to production and manufacturing. It also includes telecommunications and related services (such as fixed and cellular telephones, facsimile machines, instant messaging, teleconferencing among others.); and audiovisual equipment and services (including television, radio, video, DVDs, digital cameras, compact discs, MP3players, etc). Information and Communication Technology plays a key role in enhancing the quality of education. However, successful implementation of ICT requires strategic planning (Ngoma, 2010). The role of electronic technology in promoting economic growth and development has gained prominence globally (Tinio, 2009). Economies are transforming from industrial to knowledge based-ones where knowledge is recognized as a driver of productivity and economic growth (Organization for Economic Corporation and Development, 2004; World Bank, 2010).

Nations that succeed in harnessing the potential of electronic technology can look forward to a greatly expanded economic growth, dramatically improved human welfare and a stronger democratic government (Ngoma, 2010). ICT reduces transaction costs, increases labor productivity, and opens new trade opportunities, better communication and enhances overall efficiency. ICTs have the potential to create job opportunities, improve delivery and access to education, among other key areas. ICT facilitates information sharing and knowledge creation which increases the transparency, accountability and effectiveness of government, business and non-profit making organizations all of which contribute to an enabling environment of socio-economic development (Morawaczynski & Ngwenyama, 2007). Elements such as rapid diffusion of digital platforms like internet, mobile telephony and broadband networks are all but examples that demonstrate how pervasive ICT has become with various implications on economic growth at the macro and national levels (Morawaczynski & Ngwenyama, 2007).

Education is one of the areas where use of electronic technology provides tangible benefits. Use of technology in and for education is now seen worldwide both as a necessity and an opportunity (UNESCO, 2009). It plays a great role in the three fundamental aspects of education policy that is, access, quality and cost. ICT increases access to education through distance learning. They provide new and innovative means to bring educational opportunities to a greater number of people of all ages, especially those who have historically been excluded such as the population living in rural areas, women facing social barriers and students with disabilities (UNESCO, 2009). Computers are increasingly widespread, influencing many aspects of our social and work lives, as well as many of our leisure activities. As more tasks involve human-computer interaction, computer skills and knowledge have become more positively correlated with both occupational and personal success. Therefore, as the world moves into a technology-based society, it is important that children's classroom experiences with technology be equitable.

One of the goals for integrating ICTs in education is to enhance teaching and learning practices thereby improving quality of education (Higgins, 2003; Madumere-Obike&Imgb, 2012). ICT use in education encourages learners to move

away from learning characterized only by memorization of facts towards a process of knowledge creation (Steyn & Van Gruene, 2014; UNESCO, 2011). According to Dede (2009) ICT skills prepare pupils for the workplace where they will be required to collaborate with peers across the world to produce new intellectual work that adds value to society. However, in most developing countries such as Kenya, the potential of ICTs to support pedagogy is yet to be fully realized. To date most of the attention both on policy and research has been on how the lack of infrastructure and access to technology affects the use of ICT in pedagogy (Koo, 2008). However, it has also been shown that even in cases where the infrastructure is available, few educators are effectively integrating ICTs in curriculum delivery (Mueller, Wood, Willoughby, Ross & Specht, 2008; Gedik&Baydas, 2013). It is clear, therefore, that there are also non-technical factors that affect the adoption of ICTs for curriculum delivery. Celikand Yeshlyt (2013) attributed non-use of computer by teachers to computer-phobia caused by psychological factors, for example, having little or no control over the activity or thinking that they might damage the computer, and feeling that one's self-esteem is threatened; sociological factors such as ICT being regarded as a solitary activity, the perception that one needs to be clever to use one, and the fear of being replaced by the computer and operational factors such as the technology being beyond one's abilities, having to cope with unfriendly jargon, and the likelihood of the technology going wrong.

2. Literature Review

2.1. *The Teacher Gender and ICT use*

Studies by HatlevicOg and Arsenh (2012) and Fey (2011) have indicated that females have always lagged behind males in their willingness to learn about and use technology in schools. Female students were thought to have more negative attitudes and perceptions about using computers than their male counterparts. Females have also traditionally been less interested than males in pursuing careers in highly technical areas (DiSabatino, 2000). However, more recent studies indicate the gender disparity that once existed may have narrowed substantially (Sang, Valcke, Van Braak&Tondeur, 2010). Fey (2011) contented that male students showed a greater sense of self-confidence and displayed less anxiety in their ability to use computers than females did. Studies also showed that male students tended to exhibit greater interest in learning about and using computers than female students, largely due to a perception by female students that computers were "nerdy" (Rahimi &Yadollai, 2011). However, more studies that took place after 2000 indicated the differences between males' and females' attitudes about and confidence in using computers had narrowed (Rahimi &Yadollai, 2011; Rainer,Laosethakul, & Astone, 2003).

However, the few recent studies related to the topic make it difficult to definitively state that there is no longer a gender disparity in computer use. More research on the topic is definitely needed especially in the Kenyan set up. As a teacher, the researcher was interested in finding out whether gender disparity in computer use existed among the student teachers who will soon come out to implement the one laptop per child project by the government. Gender differences with regard to teacher beliefs, teacher self-efficacy and teacher attitudes toward computers represent an important research area. The literature on educational computing abounds with conflicting findings about the impact of gender (Teo, 2008). Since the introduction of computers, ICT related activities have been viewed as a 'male domain' (Centre for Educational Research and Innovation and Organisation of Economic Co-operation and Development, 2010). There is a significant body of evidence supporting the notion that gender plays a role in actual computer integration. For instance, Loyd and Gressard (2006) found male teachers to be more confident and less anxious toward computers compared to their female counterparts.

A study of Blackmore (Hermans, Tondeur, VanBraak & Valcke ,2008) found similar findings – males appear to be more positive in their attitudes toward computers than females. As predicted, a study of Liao (2012) in Chinese Taiwan showed that male teachers scored significantly higher than females. Significant differences between males and females were observed for technical ICT capabilities, and situational and longitudinal sustainability (Markauskaite, 2006). Since technologies have become a normal part of the workplace setting, a number of researchers argued that computing should no longer be regarded as a male domain (King, Bond, & Blandford, 2012; North &Noyes, 2002).Elsaadani (2012), concluded from his study among teaching staff of Egyptian higher education that there is no relationship between teaching staff gender and their attitude towards ICT. Further, a similar study by Yusuf and Balogyn (2011), among Ilorin University Trainee teachers found no significant influence of gender on the attitude towards ICT use. This emphasizes the need to reconsider the potential impact of gender in the context of educational ICT use. Since these studies were done outside Kenya there was need to examine the role of gender in the integration of computer technology in primary education in Kenya.

ICT integration in schools is not simply the use of computers in the teaching and learning process, but is a complex procedure. In integrating, parts are combined together, so that they work together to make a whole (LeBaron & Mdonough, 2009). The 'parts to be combined' include the school context in which integration is to take place, the technologies provided, the technical skills of teachers, the technical support provided for the installation, maintenance and upgrading of hardware and software, the pedagogical preferences and skills of teachers, the availability of appropriate electronic resources and finally, the skills and motivation of students. In addition, ICT Integration could be seen as a whole configuration of events, activities, contents, and interpersonal processes taking place in the context in which ICT is used (Mungai, 2011). However, in some instances in Kenya, integration has always been taken to mean to teach students basic computer skills (Chemwei, Njagi & Koech, 2014). The right conditions need to be in place before the educational benefits of ICT can be fully harnessed, and a systematic approach is required when integrating ICTs into the education system. This fact is often overlooked, and in their eagerness to jump onto the technology bandwagon, many education systems end up

with technologies that are either unsuitable for their needs or cannot be used optimally due to teacher perceptions arising from inadequate training (Ng, Miao, & Lee, 2009).

In relation to ICT, the vision of the Government of Kenya is to facilitate ICT as a universal tool for education and training. Further The Ministry of Education Science and Technology (MOEST) mission is to facilitate effective use of ICT (Republic of Kenya, 2014). The development of the curriculum and training of teachers both at in-service and pre-service level is central to the government's efforts of achieving its ICT policy objectives (Republic of Kenya 2014; Farrel, 2007). In an effort to promote the development of content that will address the educational needs of primary, secondary, and tertiary institutions, the government came up with two ways in which the curriculum will be developed (Kenya, MoEST, 2012). One, by adapting existing educational materials and distributing them to the schools; and the second, by beginning the process of having schools create their own e-content. Besides, building capacity in Kenya to create instructional material for an increasingly digital world is noted as an important aspect of the curriculum that is expected to pay dividends in improving the quality of education (Farrel, 2007).

In order to achieve this policy objective, Kenya Institute of Curriculum Development (KICD) has been singled out as the sole government body charged with the responsibility of developing the ICT curriculum as well as distributing the educational materials. KICD would also be in charge of overseeing other institutions that develop appropriate e-content (Farrell, 2007). Objective number 10 of the MoEST strategic plan (running from 2006 to 2011) targets strengthening the capacity of Kenya Institute of Curriculum Development (KICD) to execute this mandate among others (Kenya. MoEST, 2006). This is a strong commitment in support of the National ICT policy. Farrell (2007) asserts that while technicians can be employed to fix and maintain computers, teachers and educators must know how to exploit ICT for opening learners up to the world of knowledge. The author also noted that investment into upgrading computer laboratories and building ICT capacity at the Teacher Training Colleges (TTCs) is an intervention which can quickly yield high returns.

By providing adequate access to ICT, the TTCs can use it to achieve learning objectives at various levels. This point is also noted in the ICT in Education Options Paper (Kenya. MoEST, 2006) in which large-scale capacity building workshops for teachers have been suggested. MoEST (2006) observes that teacher training should be built on existing structures that support quality ongoing professional development for teachers (Hennessy, Onguko, Harrisson, Ang'ondi, Namalafe, Naseem, & Wamakote, 2010). The in-service program should be consistent with the workshops for pre-service teachers at teacher training colleges. Kenya MoEST (2014) further notes that the training of teachers should focus on increasing efficiency in the teachers' workload and integrating ICT to improve teaching and learning objectives.

The Kenya Primary Teacher Syllabus provides for (Kenya MoEST, 2014):

- Five core subjects that are compulsory for all students – English, Kiswahili, professional studies, physical education and information communication and technology (ICT).
- Two options each with four subjects for the student teachers to choose one of the options. Option A comprises science, home science, agriculture and mathematics while Option B comprises music, art and craft, social studies and religious education. In the first year, students' study 10 subjects, mathematics, English, Kiswahili, science, social studies and religious education, professional studies, creative arts, physical education and ICT. In the second year, students take the five core subjects (English, Kiswahili, education, physical education and ICT) and the four subjects in either Option A or Option B.
- Professional studies, which includes the traditional education disciplines such as foundations of education (philosophy, history, sociology and comparative education), curriculum studies, education psychology including educational measurement and evaluation, and educational administration as well as Special Needs Education (SNE), guidance and counseling and legal issues in education.
- Teaching practice there are three sessions – the first during the second term of the 6 terms in the programme, the second in the fourth term, and the third in the sixth term.

Recognizing that an ICT literate workforce is the foundation on which Kenya can acquire the status of knowledge-based economy by 2030, the Government plans to make education the natural platform for equipping the nation with these skills in order to create a dynamic and sustainable economic growth (Kenya, MOEST, 2013). Laptops will be provided to primary school children to enable them acquire digital skills at a young age. These skills will be used to access information which they will turn into knowledge. Consequently, the Kenyan ICT Cabinet Secretary (2015) has stated that the National Laptop Project is expected to run from April 2016 (Musembi, 2015) by which time 50,000 teachers need to have been trained on ICT integration in the classroom, besides device assembly, applications uploading, content development and delivery of devices to schools among others. It was envisaged that the teachers training should be done by end of August 2013 before which there should have been induction workshops for technical teams, master trainers and training of trainers.

A harmonization curriculum team has since been established, and comprises 30 key stakeholders (Britishcouncil <http://www.britishcouncil.co.ke/kenyas-laptops-project-how-are-teachers-are-getting-involved>, retrieved 10th August, 2014). It is envisaged that this team will address a number of key expectations mainly touching on: content format, identifying teachers for training of trainers and master trainers, structures for teacher management (support structure and types), consolidation of partners in curriculum harmonization, gap analysis, and wholesome retooling of the teacher. Teachers are the implementers of the laptop project, and will actually do the groundwork in terms of equipping students with these very vital IT skills. By directly involving them in these preliminary stages, they have a great opportunity to exercise ownership of the project.

In August, 2013, Education Cabinet Secretary, launched a harmonized curriculum guide for ICT integration in education as a preparatory measure towards the implementation of the government's one laptop per child initiative. The

curriculum was developed out of a need to equip learners with modern ICT skills which is in line with one of the flagship projects in Kenya vision 2030 (MOEST, 2013). However, it is not clearly known what is being done in primary teacher training colleges to prepare pre-service teachers both psychologically and in terms of skills. This study investigates the influences of teacher trainee perceptions on ICT integration. The curriculum guide that was launched has been assimilated into the teacher training programs so as to enhance teacher competency in ICT as Kenya braces to be one of the first African countries to entrench digital learning in its academic system. While presenting 2013/ 2014 national budget, finance cabinet secretary outlined one priority as "improving the quality of education through leveraging on ICT, starting with primary school level" (Institute of economic affairs, 2013). At the same time 53.2 billion Kenya shillings was allocated to deploy laptops to class one pupils, development of digital content, building capacity and rolling out computer laboratories. While this indicates serious commitment by the government, it is important to understand the influence of trainee teacher perceptions on prospective ICT integration in their classes.

3. Methodology

This study applied correlation research design. This study was done in five public Teacher Training Colleges in former Rift Valley Province of Kenya. The research population for the study was all teacher trainees in public teacher training colleges in Rift Valley. The colleges had a total population of 5,075 student teachers. Out of the total population 2,458 were female while 2,617 were male. Student teachers were divided into two major categories: those in first year of study and those in the second year of study (Research data,2015). In section A of the teacher trainee questionnaire, there were five items that sought to find personal information of the respondents among them their gender. The information was used to identify the respondent's gender. The Prospective Computer Use Scale was used to determine their prospective computer use. This was derived from the 'Computer Use Scale' of van Braak et al. (2004). The scale uses a 5-point Likert scale format from strongly disagree 1 to strongly agree - 5. Cronbach's alpha was calculated to determine internal consistency.

4. Results and Discussion

4.1. Effect of Trainee Teacher's Gender on Integration of Computer Technology

The objective was to examine the effect of trainee teacher's gender on integration of computer technology. This was achieved through the use of Pearson Product Moment Correlation. There was no effect of trainee teacher's gender on integration of computer technology ($r = -0.099$, $n=311$, $p > .05$) as shown in Table 1. This implies that trainee teacher's gender had no influence on integration of computer technology. This confirms a report by Yukselturk and Bulut (2009) that the gender gap has reduced over the past years in ICT use in teaching and learning processes.

		Integration	Gender
Integration	Pearson Correlation	1	-.099
	Sig. (2-tailed)		.081
Gender	Pearson Correlation	-.099	1
	Sig. (2-tailed)	.081	

Table 1: Correlation of Trainee Teacher's Gender and Integration of Computer Technology
a Listwise N=311

In order to test the relationship above, the following null hypothesis was formulated; H_0 : The trainee teachers' gender does not significantly influence prospective integration of computer technology in instruction. From the results, the p value of trainee teachers' gender is ($p = 0.974 > 0.05$) which implies that we fail to reject the null hypothesis stating that "The trainee teachers' gender does not influence integration of computer technology into future teaching practices". Therefore, there is no significant influence of trainee teachers' gender on trainee teacher integration of computer. The findings also showed that $\beta_6 = -0.002$ ($p > 0.05$). This implies that for each unit change in student teachers' gender, there no significant (0.002) unit decrease in integration of computer technology.

5. Conclusion and Recommendation

The findings revealed that there was no effect of trainee teacher's gender on integration of computer technology ($r = -0.099$, $n=311$, $p > .05$). Regression analysis results of gender ($p = 0.974 > 0.05$) implied that trainee teachers' gender had no significant influence on integration of computer technology. This agrees with, (Sang, Valcke, Van Braak & Tondeur, 2010; Solvberg, 2003) that the gender disparity that once existed may have narrowed substantially. However, more studies that took place after 2000 indicated the differences between males' and females' attitudes about and confidence in using computers had narrowed (Sang et al,2010; Solvberg, 2003). This study recommended that teacher trainers (tutors) especially female tutors should be encouraged and supported to use ICT in their teaching so as to act as role models for teacher trainees. Tutors who integrate ICT should be given incentives while those who lack computer skills should undergo ICT in-service training. (Martinovic & Zhang, 2012). It has been noted that teachers are role models, and both girls and boys benefit from having competent and motivated role models when computers are integrated in the classroom (Muller, Wood, Willoughby, Ross & Specht, 2008). Therefore, it is important to have a gender perspective on teacher training especially in relation to ICT integration.

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