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Factors for Successful Implementation of ICT Curriculum In Public Primary Teacher Training Colleges In Kenya

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Abstract
The study focused on factors for Successful Implementation of Information and Communication Technology (ICT) curriculum in Public Primary Teacher Training colleges (PPTTC) in Kenya. The study sought to answer research question; "What are the factors for successful implementation of ICT curriculum in Public Primary Teacher Training Colleges?" The study utilized descriptive research design. Purposive sampling technique was used. Respondents were tutors and administrators. Research instruments were questionnaires and interview schedules. Frequencies, means and standard deviations were used in data analysis. The study identified ten factors for successful implementation of ICT curriculum in PPTTC: Provision of ICT technical support services within the institution, Allocation of more budget for ICTs resources, Increased tutors' adoption and embrace of ICTs in teaching, In-service training for tutors in use and integration of ICTs, Tutors being role models for ICT integration, Allocation of specific units and personnel for peer support in ICTs use and integration, Designed appropriate course content and instructional programs in ICTs use and integration, Reduction in prices of ICTs hardware and software, At least one free laboratory for anyone to use and integrate ICTs and Supported teacher educator (i.e. incentive payment). Strategies should be developed to exploit the ten factors for successful implementation and integration of ICT curriculum identified by this research.

Key words: Kenya, ICT curriculum, Factors for successful implementation, Public Primary Teachers Training Colleges

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Introduction

World Bank report of 2002 indicated that world economies are transforming from industrial to knowledge based-ones where knowledge is recognized as a driver of productivity and economic growth (World Bank, 2002). Pilat, (2005) concurs by noting that some countries notably the United States and Australia, there is evidence that sectors which have invested mostly in Information Communication and Technology (ICT) have experienced an increase in the overall efficiency of using labor and capital. Bhatnagar (2005) is of the same mind in the statement that developed world where significant investment in ICT had major impacts on Gross Domestic Product (GDP), for example increased GDP by 7.8% in United Kingdom (UK), 8.3% in Singapore and 8.4% in Australia.

While it is evident that investing in ICT infrastructure plays undisputed role in economic development, nations of the world are experiencing a challenge of marching ICT infrastructure development with ICT literate human capital development. According to a UNESCO 2005 survey as cited by Zindi & Aucoin (2006), only 35% of already trained teachers in secondary schools in Europe, Asia and Africa, have basic skills in ICT, which leaves the remaining 65% of the teaching work force on the three continents still in need of computer skills. Morris (2012) asserted that despite successive training initiatives, policies and extensive funding over the last 15 years in the United Kingdom (UK), little has been done to effectively tackle the disparity of ICT skills and the training of the teaching workforce. The author further asserted that there is need to consider not just how to bolt and weld computer science into the curriculum, but also how to ensure that teachers remain equipped to teach pupils fundamental ICT.

The Government of Kenya realizing the key role played by Information and Communication Technology (ICT) skills in promoting the economic development of a country (Republic of Kenya, 2004), put in place the very first ICT policy in one of its policy documents - Sessional Paper No. 1 of 2005- and directed that all principals of secondary schools to implement it as well as formulate their own ICT policy for individual schools (Republic of Kenya, 2005). Further, the government's ICT policy document of 2006 sought to facilitate a sustained economic growth and poverty reduction; promote social justice and equity; mainstream gender in national development; empower the youth and disadvantaged groups; stimulate investment and innovation in ICT; and achieve universal access. The policy was based on four guiding principles: infrastructure development, human resource development, stakeholders' participation and appropriate policy and regulatory frameworks (Republic of Kenya, 2006). It was against this background; the government made education a natural platform for equipping the nation with ICT skills in order to create a dynamic and sustainable economic growth.

However preparing students for such a world requires teachers to acquire the new skills first. Teacher training institutions are in turn under pressure to adequately train and prepare teachers. These institutions should incorporate ICT in their programs. It is also paramount that

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technology should be infused in the entire teacher training program for trainees to learn about, to learn with and learn to incorporate technology in their teaching career when they are employed. Teachers should be equipped with skills of using ICT in teaching and in material preparation (UNESCO, 2008, Republic of Kenya, 2005).

However, the ICT curriculum implementation in schools has been faced by myriad of challenges. To mention but a few: only 2% of the schools in the country have networked computer laboratories, lack of ICT infrastructure due to lack of funding for most institutions, deliberate dumping of old and used computer and ICT equipment to education institutions hence contributing to the problems of e-waste, no ICT curriculum policy exists at school level and strategic plan to rollout the use of ICT as a teaching and learning tool, inadequate investment in ICT in teacher training colleges, and lack of ICT skills by practicing teachers (Republic of Kenya, 2012a).

In a presidential speech of March 26, 2015, the President of Republic of Kenya indicated that only 8,200 out of 21,500 schools had been connected by the time he took over office and by the time of his address, a total of 18,424 schools have been connected remaining 3,076 schools. Further, a total of Kenya shillings 1.2 billion has been transferred to 21,458 schools for construction of ICT Hardware storage rooms, and more than 2,500 teachers have undergone ICT training (Uhuru, 2015). Ochieng' (2016, February 10, 2016) reported that the president had put in place inter-ministerial team to oversee the supply of laptops to 1.2 million pupils in 22000 public primary schools by close of the year. The author (2016, February 16) further reported that class one pupils in 150 selected schools country wide were to have their laptops delivered the following week, as part of Ksh 17 billion project. She also reported that Jomo Kenyatta University of Agriculture and Technology (JKUAT) and Moi University were to provide laptops, routers and servers in the pilot stage as well as provide 600, 000 laptops to some schools by June of 2016 in the first phase. Odhiambo (2016, May 23) collaborated Ochieng' story by reporting that the Principal Secretary of Education Dr Belio Kipsang in his speech indicated that the government was devoted to ensuring that the remaining over 22000 primary schools were issued with tablets by June of that year. Thus far, there is evidence that the government is committed in developing ICT infrastructure but little seems to being done in relation to equipping teachers with ICT skills.

In session paper of 2012, the government of Kenya recognized that some of the challenges faced by the Primary School Teacher Education, included lack of curriculum for teacher trainers for primary teacher training colleges and lack of recent and relevant primary school teaching experience for a majority of staff in the teacher training institutions to keep them in sync with current practice (Republic of Kenya, 2012b). According to Cohen, Manion & Morrison (2007), if the teacher is not well prepared or if the teacher does not enable learning styles and learning behavior to change, then the best promises of ICT will not be realized- the computer will simply be another presentational devise to reinforce traditional teaching with a bit of light entertainment added in to make life less tedious.

In addressing the challenges faced in the implementation of ICT curriculum, the government made two recommendations among many other in relation to ICT and education that is first, there is need to develop a policy and strategic framework for effective integration of ICT in the teaching and learning environment and second there is need to strengthen the institutional

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framework to allow efficient integration of ICT across the entire education sector (Republic of Kenya, 2012a). This study sought to address the two recommendations.

Statement of the Problem

The projected number of teachers trained in ICT by year 2018 was to be 18, 000 teachers against 1.2 million pupils in public primary school in Kenya (Wafula, 2015, May 13). These figures were not adequate for the roll out of laptop project aimed at achieving the digital literacy in primary school education in Kenya. However, few or no studies have been done in Kenya to provide empirical data to help solve the problem. This study on 'Factors for successful implementation of ICT curriculum in PPTTC in Kenya' was aimed at discovering these factors in order to exploit them to fast tract the primary teachers training in ICT skills.

Research Question

The study was guided by the following research, "What are the factors for successful implementation of ICT curriculum in Public Primary Teacher Training Colleges?"

Review of Related Literature

Successful implementation of ICT in teaching and learning starts with singling out an educational problem. For example the need to adopt ICT in the classroom should be grounded in dissatisfaction with the status quo and the desire to improve the educational opportunities provided to students (Al-harbi, 2014). This view is supported by Hakami, Hussin, & Dahlan, (2013), who posit that it is important, at first to identify the objectives of the curriculum and the outcomes desired. Having a clear understanding of the educational problem enables educators to choose the most appropriate ICT tools to address the identified need, paying attention to their merits and demerits. Similarly, Tondeur, Van Keer, Van Braak, & Valcke (2008) emphasized that successful implementation of ICT occurs when a school has a shared vision, develops ICT implementation strategies, and its teachers' share the values expressed within the school policy and understand their implications. Lim & Khine (2006) indicated in their study of four schools that a shared vision and ICT implementation plan provide school educators with an opportunity for communication about how ICT can be used.

Roblyer & Doering (2010), emphasize that the implementation of ICT is most successful when there are supportive processes in place. Research done by Ismail (2010) argued that one of the key obligations for the school administration comprises being conscious of areas that necessitate attentions for the fruitful application of ICT within institutions. Wong, Li, Choi & Lee (2008) established that if the school administration offers support and motivation for the teachers, a suitable working atmosphere would be formed to encourage teachers to test the use of ICT within their lessons. Technical issues such as poor internet connectivity, for instance, discourage teachers from using educational technology. Studies done in 17 different European countries demonstrate the importance of technical support in encouraging teachers to use ICT tools in their teaching methods (Korte & Hüsing, 2007).Therefore, educational managers have an instrumental role to play in achieving this.

Sandholtz & Reilly (2004) claim that teachers' technology skills are strong determinants of ICT integration, but they are not conditions for effective use of technology in the classroom. They argue that training programs that concentrate on ICT pedagogical training instead of

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technical issues and effective technical support, help teachers apply technologies in teaching and learning. Jones (2004) reported that the breakdown of a computer causes interruptions and if there is lack of technical assistance, then it is likely that the regular repairs of the computer will not be carried out resulting in teachers not using computers in teaching. The effect is that teachers will be discouraged from using computers because of fear of equipment failure since no one would give them technical support in case there is a technical problem. Therefore, if there is no technical support for teachers, they become frustrated resulting in their unwillingness to use ICT (Tong & Triniada, 2005). Even though, lack of technical support discourages teachers from adopting and integrating technology in classrooms, a study by (Korte & Husing, 2007) revealed that schools in Britain and the Netherlands have appreciated the significance of technical support in helping teachers to integrate technology into their teaching. They argued that ICT support in schools influence teachers to apply ICT in classrooms without wasting time troubleshooting hardware and software problem.

Lawless & Pellegrino (2007) claim that if a training program is of high quality and the period for training lasts longer, new technologies for teaching and learning are offered, educators are eagerly involved in important context activities, teamwork among colleagues is improved and has clear vision for students attainment, the teachers may adopt and integrate ICT into their teaching.

Research has shown that teachers require experts in technology to show them the way to integrate ICT in facilitating students' learning (Plair, 2008). Teachers' understanding of content knowledge and how to apply technology to support students' learning and attainment are joined to their increase in knowledge level, confidence and attitudes towards technology. Educators who integrate technology with new teaching practices gained through professional training can transform the performance of the students (Lawless & Pellegrino, 2007). Levin & Wadmany, (2008) assert that it is imperative to allow teacher trainees to apply ICT in their programs when in school in order to be able to use the technology to supplement their teaching activities. Teachers when given time to practice with the technology, learn, share and collaborate with peer, it is likely that they will integrate the technology into their teaching. Training programs for teachers that embrace educational practices and strategies to address beliefs, skills and knowledge improve teachers' awareness and insights in advance, in relation to transformations in classroom activities.

UNESCO (2002) indicated that for education to reap the full benefits of ICTs in learning, it is essential that pre-service and in-service teachers have basic ICT skills and competencies. In a report by Wafula (2015, May 13), the projected number of teachers trained in ICT by year 2018 was to be 18, 000 teachers against 1.2 million pupils in public primary school in Kenya. These figures are not adequate for the roll out of laptop project aimed at achieving the digital literacy in primary school education in Kenya. The current study on 'Factors for successful implementation of ICT curriculum in PPTTC in Kenya' is aimed at discovering these factors in order to exploit them to fast tract the primary teachers training in ICT skills.

Methodology

This study utilized the descriptive research design to explore the existing factors for successful implementation of ICT curriculum in PPTTC in Kenya. The study purposively sampled three colleges from the upper quartile and three colleges from the lower quartile in the

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ranking of performance in the national examination-Primary Teacher Education (PTE) of the twenty two colleges. Thirty nine administrators (principals or deputy principals (3), deans of curriculum (6), heads of departments (30) and 50 tutors for second year student were involved in the study. The respondents were asked to rate fifteen items in the questionnaire on factors for successful implementation of ICT curriculum on a four points scale: 4 = Strongly Agree, 3 = Agree, 2 = Disagree and 1 = Strongly Disagree. The data collected were analyzed by computing means (μ) and standard deviations (SD).

Results and Discussion

For purposes of interpretation the scale was transformed into Strongly Disagree = 1.00-1.49, Disagree =1.50-2.49, Agree = 2.50-3.49 and Strongly Agree= 3.50 -4.00. Means values of 2.50 to 4.00 were interpreted 'factors for successful ICT curriculum implementation and integration' while mean values of 1.00 to 2.49 were interpreted 'not factors for successful ICT curriculum implementation and integration'.

Administrators and Tutors' Rating of College's Factors for Successful ICT Curriculum Implementation

My College Has:	N 89	Mean (μ)	SD
1. Provision of ICT technical support services within the institution	84	2.83	.97
2. Allocated more budget for ICTs resources	78	2.79	.99
3. Increased tutors' adoption and embrace of ICTs in teaching	83	2.76	1.01
4. In-service training for tutors in Use and integration of ICTs	85	2.76	1.02
5. Tutors being role models for ICT integration	83	2.73	.98
6. Allocated specific units and personnel for peer support in ICTs use and integration	82	2.70	.98
7. Designed appropriate course content and instructional programs in ICTs use and integration.	82	2.59	1.15
8. Reduced in prices of ICTs hardware and softwares	79	2.56	1.12
9. At least one free laboratory for anyone to use and integrate ICTs.	85	2.53	1.16
10. Supported teacher educator (i.e. incentive payment)	81	2.53	1.12
11. A way to motivate teacher educators who use and integrate ICTs	79	2.46	1.06
12. designed ICT-related courses based on applicable activities	81	2.46	1.07
13. Expanded ICT laboratory time to include evenings and night time.	82	2.45	1.09
14. Decreased the course load of the teacher educators to allow ICTs integration	81	2.37	1.11
15. At least one computer in every classroom	85	2.16	1.15

Source: (Field Data, 2018)

The findings on table showed that tutors and administrators agreed that their colleges have; Provision of ICT technical support services within the institution, Allocated more budget for ICTs resources, Increased tutors' adoption and embrace of ICTs in teaching, In-service training for tutors in Use and integration of ICTs, Tutors being role models for ICT integration, Allocated specific units and personnel for peer support in ICTs use and integration, Designed appropriate

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course content and instructional programs in ICTs use and integration, Reduction of prices of ICTs hardware and softwares, At least one free laboratory for anyone to use and integrate ICTs and Supported teacher educator (i.e. incentive payment) since the means for these factors ranged from 2.53 to 2.83. These findings were similar to Goktas, Yildirim & Yildirim, (2009) findings of a qualitative study which revealed as follows: having at least one computer in every classroom, having at least one free laboratory, supporting courses with an appropriate web page, offering more ICT-related courses, enhancing the motivation of the teacher educators and prospective teachers in regard to using ICTs in their classes, designing ICT-related courses based on applicable activities and being role models to student teachers , are possible enablers of ICTs integration to teaching and learning. The interpretation of the findings is that there are ten are factors for successful implementation of ICT curriculum in PPTTC in Kenya.

The table also demonstrates that tutors and administrators disagreed that their colleges have; A way to motivate teacher educators who use and integrate ICTs, designed ICT-related courses based on applicable activities, Expanded ICT laboratory time to include evenings and night time, Decreased the course load of the teacher educators to allow ICTs integration and At least one computer in every classroom since these factors reported means of between 2.16 to 2.46. The findings are interpreted that the five are not factors for implementation of ICT curriculum in PPTTC in Kenya.

Conclusion

In conclusion this study identified ten factors for successful implementation of ICT curriculum in PPTTC in Kenya. These factors are; Provision of ICT technical support services within the institution, Allocated more budget for ICTs resources, Increased tutors' adoption and embrace of ICTs in teaching, In-service training for tutors in Use and integration of ICTs, Tutors being role models for ICT integration, Allocated specific units and personnel for peer support in ICTs use and integration, Designed appropriate course content and instructional programs in ICTs use and integration, Reduced in prices of ICTs hardware and softwares, At least one free laboratory for anyone to use and integrate ICTs and Supported teacher educator (i.e. incentive payment).

Recommendations

This study made the following recommendations:, that PPTTC develop strategies to exploit the ten factors for successful implementation of ICT curriculum identified by this research to fast track the training of teachers with ICT skills in order to roll out ICT education in primary schools in Kenya.

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