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International Journal of Current Research
Vol. 9, Issue, 02, pp.46977-46981, February, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

INFLUENCE OF TRAINEE TEACHERS' PERCEIVED COMPETENCE ABOUT COMPUTER ON INTEGRATION OF COMPUTER TECHNOLOGY INTO FUTURE TEACHING PRACTICES

***Lilian. C. Kimaiyo**

University of Eldoret P.O. Box 5707-30100, Eldoret

ARTICLE INFO

Article History:
Received 19th November, 2016
Received in revised form
10th December, 2016
Accepted 25th January, 2017
Published online 28th February, 2017

Key words:

Trainee teacher, Perceived computer competence, Integration, Computer technology, Teaching practices.

ABSTRACT

The study sought to establish the influence of trainee teacher perceived competence about computer on integration of computer technology into future teaching practices. It was carried out in five public TTCs in the Rift Valley Province. This study employed correlation research design. The research population for the study was all teacher trainees in pubic teacher training colleges in Rift Valley. The colleges had a total population of 5,075 student teachers. Using a table of random numbers, the researcher then selected proportional sample from each stratum in every TTC to ensure that there was uniform representation of the different groups. The total sample from the five TTCs was 357 trainee teachers. The primary data was collected using a questionnaire. The study established that trainee teachers' perceived competence about computer had no statistically significant influence on integration of computer technology.

Citation: Lilian. C. Kimaiyo, 2017. "Influence of trainee teachers' perceived competence about computer on integration of computer technology into future teaching practices", *International Journal of Current Research*, 09, (02), 46977-46981.

INTRODUCTION

Recognizing that an ICT literate workforce is the foundation on which Kenya can acquire the status of knowledge based economy by 2030; the Government intends to make education the natural platform for equipping the nation with these skills in order to create a dynamic and sustainable economic growth (GoK, 2013). Laptops will be provided to primary school children to enable them acquire digital skills at a young age which they will use to access information and turn into knowledge. Consequently, the national laptop project was expected to run from January 2014 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 (Britishcouncilhttp://www.britishcouncil.co.ke/kenyas-laptops-project-how-are-teachers-are-getting-involved). 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, wholesome retooling of the teacher: online services (registration, pay slips, promotion, profile updates, casualty, real-time data, poll survey and collaborations), budget and sponsorship for capacity development and incentives: certification, professional development and promotion. The 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 (http://www.jkuat.ac.ke/2013/08/curriculum-for-ict-integration-in-education-launched). 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 (GoK, 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. The curriculum guide which will be assimilated into the teacher training programs is meant to enhance teacher competency in ICT as Kenya braces to be the first African country to entrench digital learning in its academic system. While presenting 2013/2014 national budget, finance cabinet secretary outlined one priority as

****Corresponding author:*** **Lilian. C. Kimaiyo,**
University of Eldoret P.O. Box 5707-30100, Eldoret

"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.

Literature Review

Teachers perceived competence about computers

Teachers' perceived competence about computers in this study refers to teachers' assessment of their knowledge of computers and their use. Sang, Valcke, Van Braak, Tondeur and Zhu (2011) refer to it as teachers' self-efficacy in the use of computer. Inan and Lower (2010) said that teachers who reported feeling well-prepared to use technology were more likely to integrate computers in their teaching practices as compared to teachers who felt unprepared. Donovan, Hartley and Strudler (2007) attributed the confidence with equipping of teachers with proper skills and knowledge. Mueller, Wood, Wiloughby, Ross and Specht (2008) suggested that teachers with higher levels of confidence about computers used computers more often and experienced less computer-related anxiety. On the other hand, teachers with lower levels of confidence about computers become more frustrated and more anxious, and hesitate to use computers when they encounter obstacles. Howards (2011) conducted a longitudinal study to test the influence of computer self-efficacy beliefs, outcome expectations and on computer use. Howards (2010) research findings point out that computer self-efficacy beliefs have a significant positive influence on computer use. A study by Mingaine (2013) in Meru County found that supply of qualified ICT teachers was a major challenge in the process of implementing ICT in secondary schools. Most of the schools did not have enough staff competent in ICT and therefore were not able to effectively implement ICT. He recommended that More ICT teachers should be employed and be trained on basics of ICT use in teaching and learning. This study sought to find out if trainee teachers felt well prepared to use computer technology and whether their perceived competence influenced their future computer use in the classroom.

MATERIALS AND METHODS

Research Design

According Kothari (2004) research design informs the arrangement of the conditions for the collection and analysis of the data in a manner that aims to combine relevance to the research purpose. Research designs determine procedures for collecting, analyzing, interpreting, and reporting data in research studies. They represent different models for doing research, and these models have distinct names and procedures associated with them (Cresswell, 2013). This study employed Correlation research design to investigate possible relationships between the trainee teacher computer competence and future computer use (Fraenkel and Wallen, 2000). The Pearson Product Moment Correlation Coefficient was used to establish the relationship between independent and dependent variable and multiple regression was used to test the study hypothesis. The design was used to examine the effect of trainee teacher perceived competence about computer on their intention to integrate computer technology into future teaching practices in five Teacher Training Colleges, Rift valley Province.

The Target Population

This study was done in public Teacher Training Colleges in former Rift Valley Province of Kenya. The research population for the study was all teacher trainees in pubic 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.

Sample size and sampling procedure

The study purposely selected all the five public TTCs in Rift Valley province, Kenya. The choice of the colleges took into account the fact that admission into public teacher colleges in Kenya is done jointly through a computerized system therefore likely to have trainee teachers from all counties in Kenya. The ever-increasing need for a representative statistical sample in empirical research has called for an effective method of determining sample size. To determine sample size in the study Krejie and Morgans' table (1970) of determining sample size was used. Accordingly, a sample size for a population of 5000 was 375. To obtain a representative sample from the five TTCs the researcher used stratified simple random sampling. This is a process in which certain sub-groups or strata are selected from the sample in the same proportion as they exist in the population (Fraenkel and Wallen, 2000). The target population was identified as all student teachers enrolled in public Teacher Training Colleges in former Rift Valley Province. To ensure that all subgroups of student teachers were represented in the sample, the researcher identified the number of student teachers in every subgroup. Using a table of random numbers, the researcher then selected proportional sample from each stratum in every TTC to ensure that there was uniform representation of the different groups. The total sample from the four TTCs was 357 trainee teachers.

Research Instruments

This section describes instrumentation and the administration of the instruments. In this study the researcher used questionnaire. The primary data was collected using a questionnaire which was studied in detail to ensure their reliability and validity.

The Questionnaire

The selection of the questionnaire as a tool for data collection was guided by the nature of data to be collected and objectives of the study. The questionnaire was used since the proposed study was concerned with variables that cannot be directly observed. The questionnaire was a convenient tool because it facilitated easy and quick derivation of information within a short time (Kombo & Trump, 2006). A self–administered questionnaire was used by the researcher as it is less expensive in terms of time.

Perceived competence about Computer

The Computer Self-confidence Scale consisting of nine items was utilized to explore student teachers' perceived competence about computer. It was adopted from Enochs, Riggs, & Ellis, in Sang, Valcke, Van Braak and Tondeur (2009). A 5-point Likert scale format (from 1 – strongly disagree to 5 – strongly agree) was utilized. Since items were negatively worded they were scored in the opposite direction with strongly agree receiving 1. Cronbach's alpha was calculated to determine internal consistency.

Piloting

When piloting, the researcher sought to verify the reliability and validity of the research instruments. Orodho (2005) observes that, piloting helps to detect deficiencies in research instruments. Piloting was done in a public Teacher Training College in Kakamega County. According to Polit, Beck and Hungler (2001) a pilot study is a small-scale version in preparation for a major study with its main purpose being to check the validity and reliability of the research instruments (Baker, 1994).

RESULTS

The aim of the study was to identify the relationship between trainee teacher's perceived competence about computer and integration of computer technology into future teaching practices. This was obtained using the both descriptive and inferential statistics. The descriptive statistics involved the use of frequency, percentages, mean and standard deviation, while Pearson product moment was used to establish the relationship between trainee teachers' perceived competence and integration of computer technology. Descriptive statistics of Perceived competence about computer.

The study sought to establish trainee teachers perceived competence about computer and the findings varied as summarized in Table 4.16. On whether they would be at a loss on how to help pupils' having difficulty with the computer, majority (n= 195, 62.7%) disagreed, (n=87, 28.6%) agreed, while (n=27, 8.7%) were undecided as supported by a mean score of 2.47. On whether they wondered if they had the necessary skills to use the computer for instruction, (n= 184, 59.2%) of the respondents disagreed, (n=98, 31.5%) agreed while (n= 29, 9.3%) were undecided. These findings indicate that while more than half of trainee teachers were confident that they had the necessary computer skills for instruction, over 40% were not certain of their computer skills. This was evident with a mean score of 2.56. Becta (2004), attributed teacher anxiety in integrating ICT to lack of confidence. Teacher training colleges need to allocate longer hours of practice so as to promote trainee teacher computer competence. On whether they may not be able to employ the computer in their classroom effectively, (n= 186, 59.8%) of the respondents disagreed, (n=103, 33.1%) agreed while (n=22, 7.1%) were undecided. This was evident with a mean score of 2.61. On whether they would avoid using computers in classroom, (n=208, 66.9%) of the respondents disagreed, (n=82, 26.3%) agreed while (n=21, 6.8%) were undecided as supported by a mean score of 2.32. Responses to the statement, that trainee teachers were not very effective in monitoring pupils' computer use in classrooms (n=200, 64.3%) of the respondents disagreed, (n= 91, 29.2%) agreed while (n=20, 6.4%) were undecided as supported by a mean score of 2.43. Majority of the respondents (n=176, 53.4%) disagreed that even when they try very hard, they prefer to use other instructional resources other than the computer, (n=121, 38.9%) agreed while (n=24, 7.7%) were undecided as shown in table 4.16 with a mean of 2.68. However, (n= 209, 67.2%) of the respondents disagreed that they may not know what to do to turn pupils towards computers as shown with a mean score of 2.28. Most of the respondents (n= 225, 72.3%)

Descriptive statistics table of Perceived competencies about computer

Statement	Strongly agree		Agree		Undecided		Disagree		Strongly Disagree		Mean	Std dev
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%		
When pupils' have difficulty with the computer, I am usually at a loss as to how to help them	29	9.3	60	19.3	27	8.7	108	34.7	87	28.0	2.47	1.33
I wonder if I have the necessary skills to use the computer for instruction.	25		73	23.5	29	9.3	107	34.4	77	24.8	2.56	1.30
I may not be able to employ the computer in my classroom effectively.	32	10.3	71	22.8	22	7.1	115	37.0	71	22.8	2.61	1.33
Whenever I can, I avoid using computers in my classroom.	29	9.3	53	17.0	21	6.8	92	29.6	116	37.3	2.32	1.37
I am not very effective in monitoring pupils'' computer use in my classroom.	30	9.6	61	19.6	20	6.4	101	32.5	99	31.8	2.43	1.36
Even when I try very hard, I may prefer to use other instructional resources other than the computer	42	13.5	79	25.4	24	7.7	69	22.2	97	31.2	2.68	1.47
I may not know what to do to turn pupils' towards computers.	27	8.7	47	15.1	28	9.0	94	30.2	115	37.0	2.28	1.33
I may find it difficult to explain to pupils' how to use the computer.	25	8.0	40	12.9	21	6.8	98	31.5	127	40.8	2.16	1.30
I would not invite the head teacher to evaluate my computer-based instruction.	30	9.6	42	13.5	30	9.6	85	27.3	124	39.9	2.26	1.36

Correlation between trainee teachers perceived competence about computer and integration of computer technology

		Integration	Computer competence
Integration	Pearson Correlation	1	-.225**
	Sig. (2-tailed)		.000
Computer competence	Pearson Correlation	-.225**	1
	Sig. (2-tailed)	.000	

**. Correlation is significant at the 0.01 level (2-tailed). b. Listwise N=311 Source: Research Data (2015)

disagreed that they find it difficult to explain to pupils' how to use the computer, (n=65, 20.9%) agreed while (n=21, 6.8%) were undecided as shown by a mean of 2.16. Finally, (n= 209, 67.2%) of the respondents disagreed that given a choice, they would not invite the head teacher to evaluate their computer-based instruction, (n=72, 23.1% agreed while (n=30, 9.6%) were undecided as supported by a mean of 2.26.

From the findings, the perceived competencies about computer were found to be low with an average mean of 2.41. About half of trainee teachers expressed having no difficulty assisting pupils having problems with computer, would not avoid using computers in classroom and were very effective in monitoring pupils' computer use in classrooms. Slightly over half of trainee teachers knew what to do to turn pupils towards computers and found no difficulty explaining to pupils how to use them. Moreover, about over half of trainee teachers given a choice, would invite the head teacher to evaluate their computer-based instruction. Slightly over half of trainee teachers reported having the necessary skills to use the computer for instruction and may be able to employ them in their classroom effectively, since even if it was very hard, they would not prefer to use other instructional resources other than the computer. The implication is that while slightly over half of trainee teachers felt competent about computer, a good number felt quite incompetent. Teacher trainers need to foster computer competence among trainees through intensive practice. Correlation between trainee teachers perceived competence about computer and integration of computer technology. There was a weak negative relationship between trainee teacher's perceived competence about computer and integration of computer technology (r= -.225, *n*=311, p<.05) as shown in Table 4.17. The TTC should enhance trainee teacher's perceived competence about computer by allowing plenty of time to work with and practice ICT in order to boost integration of computer technology.

DISCUSSION

From the descriptive findings of the study, the trainee teachers' perceived competencies about computer were found to be moderate (mean= 2.42). Slightly half however disagreed with the statements that they will be unable help pupils having difficulty with the computer, will avoid using computers in classroom and not being very effective in monitoring pupils' computer use in classrooms. These findings indicate that about half of trainee teachers were undecided about their ICT competence. This is a cause for concern for education stakeholders since the Government of Kenya is soon rolling out the one laptop per child project in all primary schools in Kenya to be implemented by trainee teachers once out of TTCs. These findings could suggest that trainee teachers have not had enough practice and experience with computers while in college because most computer laboratories are always locked and only opened for ICT lessons as mentioned by most interviewees during the study. Peralta and Costa (2007), noted that teachers' computer competence is a major predictor of likelihood of integrating ICT in teaching. A later study by Howards (2011) in Europe showed that teachers with more experience with computers have greater confidence in their ability to use them effectively. Yet teachers' competence has been linked to their confidence. Further, findings by Mueller, Wood, Wiloughby, Ross and Specht (2008) suggested that teachers with higher levels of confidence about computers used computers more often and experienced less computer-related anxiety. On the other hand, teachers with lower levels of confidence about computers become more frustrated and more anxious, and hesitated to use computers when they encountered obstacles. Descriptive findings also indicated that (67.2 %) of trainee teachers felt they knew what to do to turn pupils towards computers and had no difficulty explaining to pupils how to use it. If teachers were given a choice, they would invite the head teacher to evaluate their computer-based instruction. A further 69.2% of trainee teachers felt they had the necessary skills to use the computer for instruction and may be able to employ it in their classroom effectively, since even if it was very hard, they would not prefer to use other instructional resources other than the computer. This also indicates that while most trainee teachers are confident about their computer competence, a good number are unsure about their computer competence and there is need to boost their confidence through regular practice while they are still in TTCs in readiness for the implementation of the laptop project in primary schools in Kenya.

There was a weak negative correlation between trainee teacher's perceived competence about computer and integration of computer technology (r = -.225, *n* = 311, p<.05). This implied that as the values of trainee teacher's perceived competence about computer decreased the integration of computer technology increased. Regression analysis results indicated that, the p value of trainee teachers' computer competence is (p = 0.956 >0.05). Therefore, trainee teachers perceived competence about computer had no significant influence on integration of computer technology. The findings also showed that $\beta 2 = -0.002$ ($p > 0.05$) implying that for each unit decrease in teachers' perceived competence, there no significant (- 0.002) unit decrease in integration of computer technology. Also, the influence of teachers' perceived competence about computer is shown by the t-test value of 0.055 which implies that the effect of teachers' perceived competence about computer surpasses that of the error by over 0.06 times. This contradicts findings by Yuen and Ma (2008) which showed that Hong Kong teachers' implementation of ICT depended on simplicity and perceived teacher competence. Moreover, innovative teachers in Portugal linked the perception of confidence in using ICT with the loss of fear of damaging and possessing absolute control over the computer (Buabeng-Ando, 2012). The findings of this study also contradict Becta (2004) who said that "many teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of children who know more than they do". Inan (2010) also stated that teachers who reported feeling well-prepared to use technology were more likely to integrate computers in their teaching practices as compared to teachers who felt unprepared. Most of the schools did not have enough staff competent in ICT and therefore were not able to effectively implement ICT. He recommended that more ICT teachers should be employed and be trained on basics of ICT use in teaching and learning. There is need to investigate why findings of this study contradict earlier results in Asia and the western world. It is the feeling of this researcher that contradiction could be arising from the fact that the study was done among teacher trainees who may not be sure about their own abilities to integrate ICT in their teaching in future. Contradictions could also be arising from the fact that accessibility to computers in third world countries, Kenya included, is still limited therefore teacher trainees were unable to make informed decision about their own abilities to integrate computer in their future teaching.

Conclusion

The study found that there was no statistically significant influence of trainee teacher perceived competence about computer on ICT integration. Trainee teachers who scored highly on computer competence did not necessary score high on intention to integrate ICT. In view of this finding the study concluded that teachers who perceived themselves as highly competent in computer skills did not necessarily intent to use these skills for teaching purposes. It is important therefore that as teacher trainers emphasize on the very necessary computer skills they should impress upon trainees that they should be applied during teaching of course content. It is also important to note that most teacher trainees scored very low on computer competence. The implication of this finding is that most teacher trainees lack crucial computer skills and therefore feel ill-equipped to integrate ICT.

Recommendation

In view of this finding, primary teacher syllabus, should in addition to the very necessary ICT skills, introduce ICT course that should be integrated with subject content during teaching practice. This will link ICT skills and subject content therefore promote integration. Teacher training should be conducted in the same manner that the teachers are expected to integrate ICTs with teacher educators actually integrating ICTs in their classes. In addition, every subject in Kenya primary Teacher Syllabus should include ICT integration section which is compulsory. This will encourage teacher trainees to marry computer skills and course content leading to effective ICT integration.

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