Teacher Perceptions and the Use of Information Communication Technology in Schools: A Case of Public Primary Schools in Matete Sub-County, Kakamega County, Kenya.

Jacob Wambasi Kitari[1], Pamela Buhere[2] and Ndiku Judah[3]

Masinde Muliro University of science and Technology, P.o Box 190-50100, Kakamega, Kenya.

E-mail: kitarijacob@gmail.com, pbuhere@mmust.ac.ke, jndiku@mmust.ac.ke

DOI: 10.29322/IJSRP.9.10.2019.p9497
http://dx.doi.org/10.29322/IJSRP.9.10.2019.p9497

Abstract

Studies have reported that there are significant differences and positive correlations between teachers' perceptions, computer training, and level of comfort and computer usage in the classroom out of prolonged exposure to technology (Guha, 2000). In this regard, the researcher sought to establish the correlation between teachers' perceptions and the use of ICTs in public primary schools in Matete Sub-county. This was done after the World Vision had supported the Public Primary schools in Matete Sub-County with ICT gadgets which empowered the teaching fraternity with knowledge and skills in ICT. The study adopted descriptive survey research design. The sample size comprised of 18 head teachers and 18 teachers from both the World Vision ICT project supported and the same number of non-World Vision ICT project schools. Data was analyzed using descriptive statistics and inferential statistics such as mean scores, percentages and Chi-Square in which Fisher's Exact was used to determine the relationships between the covariates. The study findings indicated Pearson Chi2 (1) = 5.2800, Pr = 0.022, Cramer's V= -0.3830. These results were statistically significant. On the basis of these results, it was recommended that teacher characteristics should be considered while assigning them duties and responsibilities from their respective work stations.

Key words: Teacher Perception, ICT, Public Primary schools

Introduction

Globalization and the knowledge based economy have forced education systems worldwide to adopt ICT and weave it into their educational Milieus (Gulbahar & Guven, 2008) and the Kenyan MOEST is no exception. In the 21st century, ICT related initiatives are adopted and implemented by education systems with great appreciation of their complexity. A major aspect of the complexity involved with ICT integration into educational system is based on the many factors involved thus relating to human involvement which entails teachers, trainers and administrators and on the other hand, the technological side involving access to computers, technical support and the e-materials (Abuhmaid, 2011). Generally, there is a growing need for educational institutions to use ICT to teach the skills and knowledge students require in order to thrive in the 21st century.

Educational technology has become a cornerstone for any country's efforts to improve learners' academic achievement. It has become the focus of educators worldwide. A study by the UNESCO, (2013) investigated technology integration in schools and established that there were an increasing number of computers and other technological devices available to schools. This is because technology allows students to learn more in less time and allows schools to focus on global learning environments if used appropriately (Wood & Askfied, 2008; Gulbarhar, 2007; Kenton et al, 2005, & Zhao 2007). According to Lam & Lawrence, (2002) and World Bank, (2010),

Technology not only gives learners the opportunity to control their own learning process but also provides them with ready access to a vast amount of information over which the teachers have no control.

A survey based on a National Centre for Education Statistics (NCES, 2000) found that 39% of teachers indicated that they used computers or the internet to create instructional materials, 34% for administrative record keeping, less than 10% reported to access model lesson plans or access research and best practices. Similarly a report released by the United States department of education indicated that novice teachers were more likely to use computers or the internet to accomplish a variety of teaching objectives (NCES, 2000). These findings contradict the feelings of experienced teachers who have taught for a period of more than 20 years. This is in line with the findings of Guha (2000) who reported that there are significant differences and positive correlations between teachers' perceptions, computer training, level of comfort and computer usage in the classroom out of prolonged exposure to technology.

Limitations to the Study

i) The research study was limited to Matete Sub- County only because this was the County which had a successful World Vision ICT Project in public primary schools in Kenya. However, the study findings may be generalized to other Counties which have similar characteristics.

ii) The qualitative analytical methods were not used since the study dwelled on hypothesis testing for all the four objectives which attracted the use of inferential test statistics.

iii) Limited availability of Kenyan and African literature in connection with the effective use of ICTs especially in public primary schools yielded a sparse research context. However, a review of literature borrowed from Western Countries provided adequate backdrop for this research study.

iv) The participants in the study were purposely sampled. Biases that could have emanated from this sampling method were overcome by the objectivity of data collection methods used by the researcher.

Literature Review

Mukwa, (2015) notes that there are people in the society who feel that teaching and learning is already established and therefore there is no need to integrate technology in teaching. It should be integrated in fields like transport, agriculture and tourism. Other critics say that computers as a component of ICT pose potential health problems like poor eyesight, young people accessing pornographic materials among others. Teachers' slogan "laptops can wait, teachers cannot" is proof enough to depict the negative view on the use of ICT in schools in Kenya.

A study by Manzo (2001) found out that many students who are drawn from Electronic Arts class were struggling in most of their other classes. Once they discovered what they could do with technology, they began to appreciate the importance of excelling in all subjects. Similarly, Sherry *et al* (2001) notes that teachers should emphasise the use of meta-cognitive skills, application of skills and inquiry of learning as they infuse technology into their academic content areas.

According to Bauer and Kenton (2005) teachers, who are highly educated and skilled with technology are innovative and adopt overcoming obstacles, but they did not integrate technology consistently as a teaching and learning tool. Gulbahar, (2007) observes that school administrators and teachers feel competent in using ICT available at school. The study further notes that there are inadequate policy guidelines that would lead to successful ICT integration in the teaching and learning processes.

Chanlin *et al* (2006) studied on factors affecting teachers' use of technology in creative teaching practices and discovered that environment, personal, social and curricula issues affect the process of teaching and learning in schools. Anderson (2007) discovered through research that significant changes relate to individuals' technology related abilities, self efficacy beliefs, value beliefs and intentions to use software in their future endeavours. In this study it was noted that learners' abilities correlate with self efficacy and IT access. This prompted the researcher to assess the extent to which these concepts were true in line with the actual teachers; perceptions in Matete after the setting up of computer hubs in their territories by World Vision project in 2008.

Research Methodology

This study was exploratory in nature. It enhanced the discovery of concepts and insights. Buhere (2013) observed that exploration yields useful information concerning the nature of the phenomenon. Through Survey the researcher was able to gather relevant data concerning WV-ICT Project. The study adopted mixed methods approach that incorporated both qualitative and quantitative approaches in which data collected was analyzed descriptively using mean scores, percentages and Chi-Square. A survey of schools covered by world vision ICT project and those not covered was done in which correlation of the research findings was done for both the WV-ICT and the non WV-ICT public primary schools. This is because according to Kothari, (2008) correlation research facilitates collection of data from an accessible population in order to determine the current status and relationships between the issues under investigation. In this case, correlations facilitated collection of data related to the teachers' perceptions and trends in KCPE performance of public primary schools covered and those not covered by World Vision ICT project between 2008 and 2016. Correlation design was considered appropriate for this study because according to Kasomo, (2007), and Orodho, (2008), it ensured fair assessment of relationships of all sections of the targeted population.

Results and Discussion

In this study the researcher was to establish the correlation between teachers' perceptions and the use of ICTs in public primary schools in Matete Sub- County. The data generated was analyzed using the Chi-square test statistic in which the Fisher's exact results were used to determine the associations between the covariates.

The researcher tested the null hypothesis that there is no statistically significant correlation between the teachers' perceptions and the use of ICTs in public primary schools in Matete Sub- County, Kakamega County. Chi-Square test statistic was conducted to assess whether teachers' perceptions correlated with the use of ICT to improve the performance of school KCPE mean scores in Kakamega County. The results were indicated in the tables 1, 2, 3 and 4:

Table 1: Chi-square Association Between Gender of Teacher (t11) and their Likert Rating on Various Aspects of ICT use (t5*)

Association between Gender of teacher (t11) and their Rating that	Fisher's Exact
t52= ICT increases access to information by learners	0.633
t53= ICT has displaced teachers' work	0.102
t54= ICT increases access to pornographic literature by learners	0.391
t55= ICT causes vision disorders to learners & teachers	0.439

t56= ICT causes poor utilization of resources in school	0.281
t57= ICT increases participation in class activities by learners	0.999
t58= ICT improves social-economic development in school	0.585
t59= ICT enhances e-learning in schools	0.124
t510= ICT embraces acquisition and dissemination of ideas	0.175
t511= ICT enriches teaching, learning and research	0.644
t512= ICT causes loss of interest of certain specialization among learners	0.522
t513= ICT use forces teachers to finance ICT equipment	0.268
t514= ICT destroys school property (books, blackboards)	0.679
t515= ICT encourages teachers to embrace change in teaching approaches	0.236
t516= ICT creates opportunities of competition for success in IT promotion initiatives	0.476

Note. n=36; tab t51 t11, chi2 col row V expected / Pearson chi2(1) = 5.2800 Pr = 0.022
Cramér's V = -0.3830

Source: Stata Output, 2019

When a Chi-square test was conducted, the results indicated in Table 1: (Pearson chi2(1) = 5.2800 Pr = 0.022 Cramér's V = -0.3830), were realized. These results revealed that there was a correlation between the teachers' gender and their perceptions on t51 "Improved performance in school mean score". Up to 16 (64.00%) of the 25 males strongly agree with the statement that ICT improves performance in school mean score compared with 11 (100%) female. The findings are statistically significant (p = 0.022). This implies that gender has an effect on learners' performance. Thus stereotypes based on gender may affect how the learner performs in a given subject area. For example, females regard mathematics related subjects to be difficult; hence, they should be done by male pupils. This may not be the truth but it is there.

Table 2: Chi-square Association Between Teacher Education (t12) and their Likert Rating on Various Aspects of ICT use (t5*)

Association between teacher education (t12) and their Rating that	Fisher's exact
t51= ICT Improves school mean score	0.354
t52= ICT increases access to information by learners	0.327
t53= ICT has displaced teachers' work	0.121
t54= ICT increases access to pornographic literature by learners	0.602
t55= ICT causes vision disorders to learners & teachers	0.445

t56= ICT causes poor utilization of resources in school	0.354
t57= ICT increases participation in class activities by learners	0.463
t58= ICT improves social-economic development in school	0.724
t59= ICT enhances e-learning in schools	0.770
t510= ICT embraces acquisition and dissemination of ideas	0.884
t511= ICT enriches teaching, learning and research	0.765
t512= ICT causes loss of interest of certain specialization among learners	0.805
t513= ICT use forces teachers to finance ICT equipment	0.579
t514= ICT destroys school property (books, blackboards)	0.849
t515= ICT encourages teachers to embrace change in teaching approaches	0.324
t516= ICT creates opportunities of competition for success in IT promotion initiatives	0.633

Note. n=36

Source: Stata Output, 2019

After conducting a Chi-square test statistic, the Fisher's exact results shown in Table 2 revealed that there is correlation between teacher's Education and the various aspects of ICT use in public primary schools in Ma Sub-County. These results are contrary to the findings of the study by Bauer and Kenton (2005). In their stu teachers who are highly educated and skilled with technology are innovative and adopt overcoming obstacl but they did not integrate technology consistently as a teaching and learning tool.

Table 3: Chi-square Association Between Teacher Experience (t15) and their Likert Rating on Various Aspects ICT use (t5*)

Association between teacher experience (t5) and their Rating that	Fisher's exact	Cramer's V
t51= ICT Improves school mean score	0.845	
t52= ICT increases access to information by learners	0.002	0.6398
t53= ICT has displaced teachers' work	0.446	
t54= ICT increases access to pornographic literature by learners	0.462	
t55= ICT causes vision disorders to learners & teachers	0.484	

t56= ICT causes poor utilization of resources in school	0.654	
t57= ICT increases participation in class activities by learners	0.896	
t58= ICT improves social-economic development in school	0.478	
t59= ICT enhances e-learning in schools	0.932	
t510= ICT embraces acquisition and dissemination of ideas	0.039	0.5616
t511= ICT enriches teaching, learning and research	0.067	
t512= ICT causes loss of interest of certain specialization among learners	0.046	0.4783
t513= ICT use forces teachers to finance ICT equipment	0.199	
t514= ICT destroys school property (books, blackboards)	0.853	
t515= ICT encourages teachers to embrace change in teaching approaches	0.658	
t516= ICT creates opportunities of competition for success in IT promotion initiatives	0.019	0.6860

Note. df=degrees of freedom; Cramer's V: 0-.19=weak association; .20-.49=moderate association; >.49=strong associate

Source: Stata Output,2019

There is a relationship between the teachers experience in Matete Sub-County, and their perceptions on t52 "Increased access to information by learners". Up to 23 (63.89%) teachers strongly agree with the statement that ICT increased access to information by learners of which 10 have between 1-5 yrs of experience, p=0.002.

There is a relationship between the teachers experience and their perceptions on t510 "Embraces acquisition and dissemination of ideas". Up to 20 (55.56%) teachers agreed with the statement that ICT embraces acquisition and dissemination of ideas of which 8 have between 11-15 years of experience.

There is a correlation between the teachers experience in Matete Sub-County and their perceptions on t516 "Create opportunities of competition for success in IT promotion initiatives". Up to 34 (94.44%) teachers agree with the statement that ICT creates opportunities of competition for success in IT promotion initiatives of which 11 have between 11-15 years of experience. The expected frequency for that cell was 10.4. These findings conform with the results from a survey based on a National Centre for Education Statistics (NCES, 2000), which found that 39% of teachers indicated that they used computers or the internet to create instructional materials, 34% for administrative record keeping, less than 10% reported to access model lesson plans or access research and best practices. Similarly a report released by the United States department of education indicated that novice teachers were more likely to use computers or the internet to accomplish a variety of teaching objectives (NCES, 2000). These findings contradict the feelings of experienced teachers who have taught for a period of more than 20 years. This is in line with the findings of Guha (2000) who reported that there are significant differences and positive correlations between teachers' perceptions, computer training, level of comfort and computer usage in the classroom

out of prolonged exposure to information technology.

Table 4: Chi-square Association Between Teacher ICT Training (t16) and their Likert Rating on Various Aspects of ICT use (t5*)

Association between teacher ICT training (t16) and their Rating that	Fisher's exact	Cramer's V
t51= ICT Improves school mean score	0.148	
t52= ICT increases access to information by learners	0.040	0.4010
t53= ICT has displaced teachers' work	0.999	
t54= ICT increases access to pornographic literature by learners	0.172	
t55= ICT causes vision disorders to learners & teachers	0.216	
t56= ICT causes poor utilization of resources in school	0.999	
t57= ICT increases participation in class activities by learners	0.999	
t58= ICT improves social-economic development in school	0.622	
t59= ICT enhances e-learning in schools	0.536	
t510= ICT embraces acquisition and dissemination of ideas	0.005	0.8090
t511= ICT enriches teaching, learning and research	0.027	0.5330
t512= ICT causes loss of interest of certain specialization among learners	0.051	
t513= ICT use forces teachers to finance ICT equipment	0.328	
t514= ICT destroys school property (books, blackboards)	0.321	
t515= ICT encourages teachers to embrace change in teaching approaches	0.999	
t516= ICT creates opportunities of competition for success in IT promotion initiatives	0.005	0.8044

Note. df=degrees of freedom; Cramer's V: 0-.19=weak association; .20-.49=moderate association; >.49=strong association

Source: Stata Output, 2019

The results from Table 4, indicates that there is a correlation between teacher-ICT training (t16) and their perceptions on t52 "Increased access to information by learners". Up to 23 (63.89%) teachers who are ICT -trained strongly agree with the statement that ICT increases access to information by learners. These results contradict the findings by Mukwa, (2015), who postulates that there are people in the society who

feel that teaching and learning is already established and therefore there is no need to integrate technology in teaching. It should be integrated in fields like transport, agriculture and tourism. Other critics say that computers as a component of ICT pose potential health problems like poor eyesight, young people accessing pornographic materials among others. Teachers' slogan "laptops can wait, teachers cannot" during the introduction of one laptop per child in public primary schools by MOEST in Kenya, is proof enough to depict the negative view on the use of ICT by teachers of public primary schools in Matete.

There is a relationship between teacher- ICT training (t16) and their perceptions on t510 "Embraces acquisition and dissemination of ideas". Up to 19 (57.58%) teachers who are ICT -trained agree with the statement that ICT embraces acquisition and dissemination of ideas. These significant results have a backing from the study by Lam & Laurence (2002) who observed that Technology not only gives learners the opportunity to control their own learning processes but also provides them with ready access to a vast amount of information over which teachers have no control.

There is a relationship between teacher- ICT training (t16) and their perceptions on t511 "Enrich teaching, learning and research". Up to 31 (93.94%) teachers who are ICT -trained strongly agree with the statement that ICT enriches teaching, learning and research. The findings are quite critical in line with the argument by Schiller (2003) who points out that personal characteristics, such as educational level, age, gender, personal experience with computers and attitude towards ICT can influence the adoption of technology.

There is a relationship between teacher- ICT training (t16) and their perceptions on t516 "Create opportunities of competition for success in IT promotion initiatives". All the 33 teachers who are ICT -trained agree with the statement that ICT creates opportunities of competition for success in IT promotion initiatives. These findings relates to that of Tsikalaki & Valatidis (2010) who believes that Technological progress combined with a parallel evolution of pedagogical sciences results in the belief that integration of ICT into learning may bring about a new era in the educational practices. However, the introduction of ICT in educational practice is followed by a myriad of essential gaps and encounters multifold difficulties. All stakeholders should therefore embrace paradigm shift to the world of technology with a lot of positivity in order to match the fast growing technological changes globally.

Summary of the Research Findings

This study sought to establish the correlation between teachers' perceptions and the use of ICT in public primary schools in Matete Sub-County, Kenya. The researcher tested the null hypothesis that there is no statistically significant relationship between teachers' perceptions and the use of ICT in public primary schools in Matete Sub- County. Chi-square test statistic was conducted from which the Fisher's exact results, Pearson Chi2(1)=5.2800, Pr=0.022, Cramer's V=0.3830 were shown. The results meant that there was a correlation between the gender of the teacher and the use of ICT in public primary schools in Matete Sub-County. The overall model indicated Fisher's exact results that showed existence of a correlation between specific teacher characteristic; for example, the gender of the teacher showed p=0.022; Teachers' experience was correlated with t52(increased access to information), p= 0.002; and variable t510(embraced acquisition and dissemination of ideas), p= 0.039. Finally, the researcher correlated teachers' ICT training (t16) and ICT use in public primary schools in Matete Sub-County. Variable t52 (increased access to information by learners) was correlated with variable (t16= teachers' ICT training). The results showed p=0.040; t510 (embraced acquisition and dissemination of ideas) was correlated with t16= teachers' ICT training and the results indicated p= 0.005; on correlating variable t511(enriched teaching, learning and research), the results showed p= 0.027; finally, variable t516 (ICT create opportunities for competition in promoting IT initiatives), results indicated P=0.005.All these findings were statistically significant. Therefore, the researcher rejected the null hypothesis that there is no correlation between teachers' perceptions and ICT use in public primary schools in Matete Sub-County.

Conclusion

The researcher conducted a Chi-square test statistic to ascertain the association between specific teachers' perception and the use of ICT in public primary schools in Matete Sub-County. Fisher's exact results indicated Pearson Chi2 (1) =5.2800, Pr =0.022, Cramer's V=0.3830. These findings showed that there was a correlation between teachers' perceptions and ICT use in public primary schools.

Therefore, the researcher concluded that there was a correlation between teachers' perceptions and the use of ICT in public primary schools in Matete Sub-County, Kenya.

Recommendation

The study was designed to establish the correlation between teachers' perceptions and the use of ICTs in public primary schools in Matete Sub-County. The findings from this study indicated Pearson Chi2 (1) = 5.2800, Pr = 0.022, Cramer's V= -0.3830. These results meant that there was statistically significant correlation between teachers' perceptions and ICT use in public primary schools in Matete Sub- County. On the basis of these findings it was therefore recommended that teachers' perceptions should be considered while assigning them duties and responsibilities in their respective work stations.

References

Abuhmaid, A. (2011*). ICT training courses for teacher professional development in Jordan*. The Turkish online Journal of educational technology, 10(4), 195-2010

Anderson, S. & Maninger R. (2007). *Pre-service teachers' abilities, beliefs and intentions regarding technology integration.* Journal of educational computing research 37(2) 151-172

Baller, J & Kenton, J. (2005). *Toward technology integration in the schools; why it isn't happening*. Journal of technology and teacher education, 13(4), 519-546

Bauer, J. & Kenton, J. (2005). *Toward Technology Integration in the schools: Why it isn't happening. Journal of Technology and Teacher Education*, 13(4), 519-546

Buhere, P. (2013).Implementation of Inclusive Education for Learners with Special Needs in Mainstream Primary Schools in Kenya. Unpublished PhD Thesis. Moi University, Eldoret.

Chanlin, L., Chu, H., Chang S. & Horng, J. (2006). Factors influencing Technology integration in teaching. A Toiwanese perspective. Innovations in education and teaching international, 43 (1) 57-68

Guha, S. (2000). A comparative analysis of present and preferred situations of elementary grade teachers in using computers for classroom instruction, ERIC Document reproduction Service No. ED440089

Gulbahar Y. (2007). Technology Planning A Roadmap to successful Technology integration in schools. Computers and education, 49 (4) 943-956

Gulbahar Y. & Guven J. (2008). A survey on ICT usage and the perception of social studies teachers in Turkey. Educational technology & society, 11(3), 37-51.

Kothari, C .R. (2010). *Research Methodology, Methods and Techniques* (Revised Edition). New Delhi: New age international (Ltd, Publishers).

Lam, Y. and Lawrence G. (2002). Teacher-student role redefinition during a computer based second language project: Are computers catalysts for empowering change? Computer assistant language learning, 15 (3), 295 – 315

Manzo, K.K. (2001). Academic record. Education Week, 20(35), 22-35. Washington

Mkuwa C. W. (2015). Integration of Educational Technology in Teacher Education; Eldoret, Kenya, Moi University Press

NCES (2000). Internet access in U.S. Public Schools and classrooms: 1994:99. Washington DC: NCES 2000-086

Orodho, J.A. (2008). Techniques of writing research proposals and reports in education and social sciences, second edition, Maseno, Karezja HP Enterprises

Sherry, L., Bilig, S., Jesse, D., and Acosta D.W. (2001). Assessing the impact of instructional technology a student achievement T.H.E Journal, 28(7), 40-43

Tsikalaki K. & Charalambous K. (2006). Problems faced by the Cyprian primary school teachers during the ICT introduction in the teaching and learning processes. Proceedings, 5th ICT conference. Thessaloniki, October, 2006

UNESCO. Bangkok (2013). Case studies on integrating ICT into teacher education curriculum in Asia. Bangkok: UNESCO Bangkok

Wood, R. and Ashfield, J. (2008). The use of interactive white board for creative teaching and learning in literacy and mathematics; a case study. British Journal of Educational Technology, 39(1), 84-96

World Bank (2010). Information and Communication Technology for Education in India and South Asia (Vol.1). Extend summary. Washington D.C: InfoDev/Price Water house coopers

Zhao, Y. (2007). Social Studies teachers' perspectives of technology integration. Journal of technology and teacher education. 15(3), 311-33