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PREPAREDNESS OF PUBLIC PRIMARY SCHOOLS IN THE ADOPTION OF ICT FOR TEACHING AND LEARNING IN ABOTHUGUCHI WEST DIVISION, MERU, KENYA

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How to cite:

Nkirote, S., Mwenda, E. and Kamoyo J. M. (2022). Preparedness of public primary schools in the adoption of ICT for teaching and learning in Abothuguchi West Division, Meru, Kenya. *In: Isutsa, D. K. (Ed.). Proceedings of the 8th International Research Conference held in Chuka University from 7th to 8th Oct 2021 Chuka, Kenya. p.418-425.*

ABSTRACT

Adoption of computers in schools has been recognized as a way of making the education process more efficient, richer and relevant. The Kenyan Ministry of Education is committed in the adoption of ICT in learning and teaching. The implementation process of the project has been slow and has been attributed to lack of preparedness. This slow pace has been blamed on level of school preparedness in adoption of laptop in learning and teaching process. However, no empirical study has been conducted to explain this. The present study asssessed competency of teachers in teaching using computers. It employed discipline survey study design with a target population of the study was 1495 subjects from 17 Public Primary Schools. The sample size was 312 respondents consisting six headteachers sampled purposively, 42 teachers sampled randomly and 264 pupils sampled using stratified random sampling. The study used questionnaire for headteachers and teachers. The overall mean for the teachers' competency in adoption of laptops for teaching and learning was 2.45. This implies that majority of the Public Primary School teachers disagreed that their schools were prepared in terms of teachers' competency in adoption of laptop for teaching and learning.

Keywords: ICT Preparedness, ICT adoption, ICT teaching, ICT learning

INTRODUCTION

Information Communication and Technology (ICT) adoption has been known in schools as a way of making richer, relevant and more effective the education process (Maruti, 2010). Different countries around the world have often instigated programs that are focused in embracing information and communication technology (ICT) use by teachers in their daily training activities and learning processes in school. Jimoyiannis and Komis (2007) found out that countries such as China, Singapore, UK, Australia and European Union (EU) have initiated courses enhancing teachers' ICT skills. These programs are important in adjusting and using information communication and technology in education processes activities. Integrating and planning efficient ICT teachers' groundwork programs is very significant measure for a wide-ranging and successful school improvements (Khan et al., 2012).

DES (2008) reported that those schools which made keen computer facilities accessible to teachers registered more high-quality and creative teaching resources in classrooms and technological knowhow among students. The DES (2008) also indicated that many teachers apply some of ICT in class groundwork and planning. This is a pointer to better adoption and implementation of ICT in education processes of teachers. DES (2008) survey also reported that the provision of ICT facilities and hardware maintenance in schools and professional development opportunities is strategically important for the development of ICT in schools. A review by Bingimlas (2009) on obstacles to the efficacious integration of IT in learning and teaching environment reported that teachers in Australia had a resilient longing to incorporate their ICT skills in schools learning processes. However, Bingimlas (2009) indicated that teachers encounter barriers such as lack of self-confidence, shortage of capability and absence of information communication and technology resources access. The review further indicated that confidence, proficiency and access to resources are the serious mechanisms of technology incorporation in schools. Thus, Bingimlas (2009) argued that as part of preparation for integration of ICT in schools, resources of ICT including hardware and software, effectiveness of professional development, technical support and sufficient time need to be made available

to teachers. Thus, all these components need to be in place to increase the leeway to excellent amalgamation of ICT in learning and teaching occasions.

Turksapa, Mioduser and Leitner (2000) stated that personal detail information for instance gender, age, instructors' ICT involvement and rank of academic of teachers significantly artificialize the rate at which ICT was regarded and executed at Greece (Mioduser *et al.,* 2000). On the other hand, Albugami and Ahmed (2015) reported that in Saudi secondary schools' ICT adoption was alleged as an imperative aspect in moving fast the presentation, learning experience, collaboration, and ICT learning results. Most teachers in East Africa have not adopted the use of ICT programs in their training. This ought to be, as a result of many interconnected features, for example non-manipulative and manipulative and teacher aspects (Tedla, 2012). Manipulative aspects comprise of: expertise,

teachers' assurance and opinions, ICT, information and accessibility of ICT means, while non-manipulative aspects are: gender, age, educational experience, faith, computer skill, national procedures and exterior provisions.

A harmonization curriculum team was established by the principal clerk of the Ministry of Education Science and technology to look into: content format, identifying teachers for training, structures for teacher management, harmonization of curriculum, wholesome retooling of the teacher, gap analysis, and sponsorship for capacity development and incentives (Okinda, 2014). It remains unclear whether the public primary schools are well prepared in terms of infrastructure, teacher competency, technical support and teachers' and pupils' attitude. This study aimed at ascertaining teachers' competences in adoption of ICT for teaching and learning in public primary schools in Abothuguchi West Division

This research finding will add value to policy makers in the Ministry of Education Science and Technology (MOEST), teachers and pupils. The policy makers in MOEST may benefit from this study by using the findings to come up with policies that may help in improving school preparedness for ICT project execution in terms of infrastructure, teacher competency, technical support and teachers and pupils' attitude towards the project. The study may benefit the teachers by enlightening them on best skills to integrate ICT in improving the KCPE performance in public primary schools. To the pupils, it is anticipated that the outcomes of this study will facilitate resolution of school based challenges that might hinder implementation of the project and hence hasten the process of embracing of ICT in education and learning processes.

RESEARCH METHODOLOGY

This study opted for descriptive survey research design. This is a category of study design that designates a population, condition, or occurrence that is being deliberated on. It emphases on responding to the "how", "what", "when", and "where" inquiries in a research delinquent, rather than the "why". It is very suitable when carrying out a research whose objective is to ascertain features, trends, frequencies, categories, and correlations.

This research methodology handles difficulty with slight to no significant evidence and provide it a suitable explanation by means of quantitative and qualitative research methods. Descriptive research targets to exactly define a study problem. Descriptive-survey research employs surveys to collect information on variable subjects. This data purposes to know the degree to which different circumstances can be achieved among the subjects. Descriptive survey is used for collecting information on people's approach, habits, attitudes or some of the diversity of learning or societal issues (Gall, Gall & Borg, 2003). The design was proper in allowing the researcher to elucidate the extent to which schools were ready in terms of infrastructure, teacher competency.

This research was done in public primary schools in Abothuguchi West Division. Abothuguchi West Division is found in Meru Central Sub-County, Meru County. There are three educational zones in the division: Kithirune, Githongo and Katheri. The division has an area of 61.4km2. The division has 17 public primary schools. Kithirune Zone has six public primary schools, Githongo has three while Katheri has eight public primary schools.

Table 76: Sampling table

Category	Total Population	Procedure	Sample size
Head teachers	17	Purposive	6
Teachers	196	Simple random	42
Pupils	1,282	stratified random	264
Total	1,495		312

RESULTS AND DISCUSSION

The study sampled six head teachers, 42 teachers and 264 pupils. However, a total of 5 head teachers and 33 teachers responded to the questionnaires. The response rates for teachers was 82.5 while for the head teachers was 83.3% and that of the pupils was 100%. The overall response rate was 96.8% which implies that the response rate was sufficient based on Babbie (2015)

Head Teachers and Teachers Demographic Characteristics

The instructors were invited to include their gender. The graphical presentation of results is shown in Figure 2.

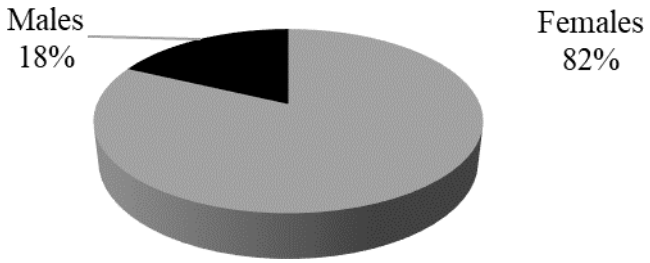

Figure 30: Gender of the teachers

The results revealed that majority of the teachers at 82% were females while 18% of them were males. The study also collected information on the highest educational prerequisite of trainers. The results are revealed in Table 3.

Table 77: Highest educational qualification

Educational qualification	Frequency	Percent
Certificate	15	39.5
Diploma	16	42.1
Bachelor's degree	5	13.2
Masters	2	5.3

Table 4: Duration at current school

Duration at current school	Frequency	Percent
Bellow 3 years	6	15.8
3 - 6 years	8	21.1
7 - 9 years	7	18.4
10 and above years	17	44.7

The research also required the teachers to state the position they held in their respective schools. The results are summarized in Figure 3.

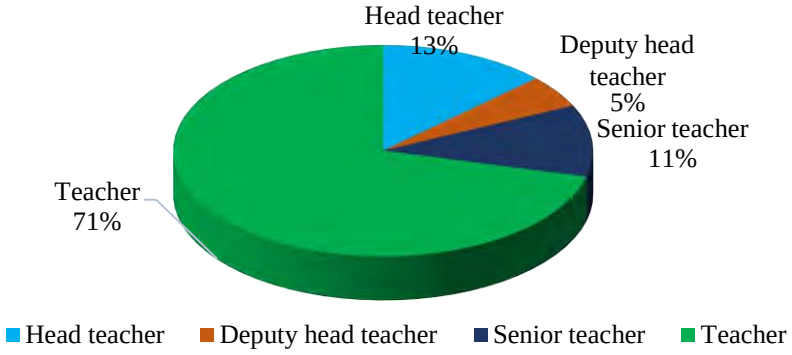

Figure 31: Position held in School

Teachers' Competences in Adoption of ICT for Teaching and Learning

The study further investigated teachers' competences for learning and teaching in adoption of laptops in public primary schools in Abothuguchi West Division. The outcomes are summarized in Table 6. The outcomes in in Table 6 specified that 53.3% of the teachers agreed and 10.5% of them strongly agreed that they had attended a course in computer applications. This shows that in public primary schools most teachers had a basic computer training and hence they had basic competency to utilize laptops in teaching and learning. This differs from Andiema (2015) study findings pointed out that teaching grade in the usage of computers in public primary schools by teachers was inadequate in the North Rift Region, Kenya. However, the pupils seemed to be unaware whether the teachers were competent enough to use computers to teach them since they do not use them in class.

Table 78: Teachers' competences in adoption of ict for teaching and learning

Statement	SD		D		U		A		SA	
	F	%	F	%	F	%	F	%	F	%
I have attended a course in computing	6	15.8	6	15.8	1	2.6	21	55.3	4	10.5
I have basic knowledge in computer use and applications	3	7.9	4	10.5	3	7.9	27	71.1	1	2.6
I can competently use a computer to prepare scheme of work	11	28.9	17	44.7	3	7.9	7	18.4	0	0
I can competently use a computer to prepare teaching materials	9	23.7	20	52.6	3	7.9	6	15.8	0	0
I can competently use a computer to teach with aid of a projector	9	23.7	17	44.7	3	7.9	9	23.7	0	0
I can competently use a printer to print teaching materials	12	31.6	15	39.5	4	10.5	7	18.4	0	0
I can effectively connect a computer and power it on	2	5.3	11	28.9	1	2.6	19	50.0	5	13.2
I can effectively and efficiently use a computer to serve the internet for teaching materials	10	26.3	10	26.3	2	5.3	15	39.5	1	2.6
I can connect a computer to a printer	9	23.7	16	42.1	1	2.6	11	28.9	1	2.6
I can prepare my lesson notes using a computer	13	34.2	14	36.8	3	7.9	8	21.1	0	0
I can effectively install new software on a computer	14	36.8	13	34.2	4	10.5	7	18.4	0	0
I can competently operate Microsoft word program on a computer	12	31.6	15	39.5	3	7.9	8	21.1	0	0
I can competently control a workbook (e.g excel) program on a computer	12	31.6	17	44.7	3	7.9	6	15.8	0	0
I can competently work on a data base program (eg access) on a computer	15	39.5	15	39.5	3	7.9	5	13.2	0	0
I can use world wide web to access information	11	28.9	13	34.2	3	7.9	10	26.3	1	2.6
I can use computers for pupils' grade record keeping	10	26.3	15	39.5	3	7.9	10	26.3	0	0

The results also indicated that 71.1% of the teachers agreed and 2.6% of them strongly agreed that they had basic knowledge in computer use and applications. This indicates that a high number of teachers were in a position to basically use laptops. Findings from the pupils could not ascertain this because most of them indicated that they were unaware whether their teachers had basic knowledge in computer use and applications. However, majority 44.7%) of teachers disagreed and 28.9 strongly disagreed with the assertion that they could competently use a computer to prepare scheme of work. This supports Ilomäki (2008) who argued that majority of teachers have adequate abilities for daily and unchanging operational activities, nevertheless many of them still have difficulties in discovering an expressive pedagogical technology use. This denotes that most instructors are not competently equipped to embrace laptops in teaching and learning.

The study showed that 52.6% of the teachers differed and 23.7% strongly differed that they could competently use a computer to prepare teaching materials. This implies that a number of teachers were not in a position to competently use a computer to prepare teaching materials which is one of essential requirements for competency preparedness in adoption of laptops in teaching and learning. The pupils could not tell the level of their teachers' competency to use computers to prepare teaching materials.

The study also established that only 23.7% of teachers could competently use a computer to teach with aid of a projector while 44.7% of the teachers strongly disagreed and 23.7% disagreed with the assertion that they could competently use a computer to teach with aid of a projector. The study further indicated that 39.5% of teachers disagreed and 31.6% disagreed with the assertion that they could competently use a printer to print teaching materials from a computer. Their school had inadequate printers. Focused group discussion with the pupils also

indicated that the most schools lacked whiteboards and printers. This inability to use the projector and printers implies that teachers in public primary schools are ill prepared for implementation of laptops in teaching and learning in terms of competency. However, the findings showed that majority (50%) of the teachers agreed and 13.2% of them agreed with the assertion that they could effectively connect a computer and power it on. This corroborates the finding that basic training in computer applications was popular among the teachers.

The study further indicated that only 39.5% of teachers agreed with the statement that they could effectively and efficiently use a computer to serve the internet for teaching materials. On the other hand, 26.3% of teachers strongly disagreed and 23.6% of them disagreed with the statement that they could effectively and efficiently use a computer to serve the internet for teaching materials. This suggests that, majority of trainers are not skillful in the use of internet to access teaching materials. This is in tandem with Mutuku and Ogutu (2018) argument that teacher competency is invaluable in embracing of ICT in learning and teaching.

The study similarly established that only 28.9% of the teachers agreed that they could connect a computer to a printer. This further corroborates the finding that majority of teachers are not able to use printers. The study additionally specified that 34.2% of teachers strongly disagreed and 36.8% disagreed with the assertion that they could prepare lesson notes using a computer. This finding further consolidates the finding that teachers are ill prepared competency wise in adopting laptops for teaching and learning. The study further indicated that only 18.4% of teachers agreed that they could effectively install new software on a computer while 34.2% of teachers disagreed and 36.8% strongly disagreed with the assertion that they could effectively install new software on a computer. This is against Lawrence and Tar (2018) assertion that teacher competency is one of the factors that impact incorporation of ICT in education processes. Thus, lack of teacher competency could be one of the reasons why laptop project implementation is slow paced.

The study further indicated that only 21.1% of teachers agreed with the statement that they could competently operate word processing program on a computer. On the other hand, 31.6% of teachers strongly disagreed and 39.5% of them disagreed with the statement that they could competently operate word processing program on a computer. In addition, the study established that only 15.8% of teachers settled with the statement that they could competently operate a spread sheet (e.g. excel) program on a computer. The study further indicated that only 13.2 percent of trainers settled by the declaration that they could competently operate a data base program (e.g. access) on a computer. This implies that very few teachers can use computer applications such as word processing, spreadsheets and data base programs. This further, consolidates the assertion that teachers are ill prepared competency wise in adopting laptops for teaching and learning. This supports Wenli, Xiaolu, Tan and Wong (2007) study finding that deficiency of consistency in respect to ICT know-hows, improvement and competencies were some of the factors that hinder ICT use in education.

The research findings additionally directed that 28.9% of teachers strongly disagreed and 34.2% of them disagreed with the statement that they could use World Wide Web to access information with only 26.3% of them agreeing with the assertion. In addition, only 26.3% of teachers agreed with the assertion that they could use computers for pupils' grade record keeping. This implies that teachers in public primary institutions are not competent in using computer to access World Wide Web and to keep records. This differs from Wenli, Xiaolu, Tan and Wong (2007) study which found out that many pre-service trainers were established to be effective in using the major software, among others; chatting, using google to search for online information, email, they frequently use technology applications for entertainment, communication, and using efficiency gears, and for socialization than for learning purposes. The overall mean for the teachers' competences in adoption of laptops for learning activities was 2.45 percent. This implies that popular number of public primary school instructors disagreed that their schools were prepared in terms of teachers' competency in adoption of laptop during education process. This supports Tar and Lawrence (2018) finding that teacher competency is one of the elements that impact integration of ICT in teaching practices and learning processes.

The teachers were also requested to highlight training needs for teachers that can enhance adoption of laptops in learning and teaching. They indicated that required adequate computer training, incorporation of computer training in teacher's colleges curriculum, introduction of ICT training programs in schools, provision of induction computer courses, integration ICT teaching and learning in the school curriculum keenly by providing necessary materials and equipment and attendance of seminars and workshops on use and application of ICT in education.

Teachers' and Pupils' Attitude towards Adoption of ICT in Education

The fourth objective of this study established the teachers' and pupils' insolence towards adoption of ICT for teaching and learning in public primary schools in Abothuguchi West Division. The findings are summarized in Table 8. The results in in Table 8 showed that 57.9 percent of the teachers agreed and 26.3% of them strongly settled that computers save time and efforts. The results also showed that 52.6% of the teachers agreed and 31.6% of them strongly settled that computers motivate pupils to do more work. Conclusions from the pupils also pointed out that the pupils felt that usage of laptops could ease their studies and motivate them to do more work. The outcomes specified that teachers at 28.9% strongly disagreed and 34.2 disagreed with the statement.

Table 79: Teachers' and Pupils' Attitude towards Adoption of ICT for Teaching and Learning

Statement	SD		D		U		A		SA	
	F	%	F	%	F	%	F	%	F	%
Computers are time saving.	0	0	1	2.6	5	13.2	22	57.9	10	26.3
Computers inspire learners to do additional work	2	5.3	0	0	4	10.5	20	52.6	12	31.6
I desire to do things by hands.	11	28.9	13	34.2	6	15.8	8	21.1	0	0
Computer technology skills can upgrade the level of teaching and learning in institutions	2	5.3	0	0	5	13.2	23	60.5	8	21.1
Adoption of computers with hypermedia and illustrations supplements teaching and enhance interactive learning	2	5.3	0	0	5	13.2	22	57.9	9	23.7

This implies that teachers would prefer to use computers to do things rather than using hands. This supports Lau and Sim (2008) who established that teachers were eager to adopt ICT in schools. In addition, 60.5% of teachers agreed and 21.1% of teachers strongly established with the account that computer technology skills can progress the superiority of teaching/learning in learning institutions. The research further indicated that 57.9% of teachers agreed and 23.7% of them strongly agreed that the usage of computers with multimedia and graphics enriches teaching and enhance interactive learning. These findings imply that teachers' and pupils' had an optimistic approach to adoption of laptops in teaching and learning. This supports Haron, Hanafi, Ahmad, Zainal, Mamat and Yusof (2018) study finding that teachers generally had positive attitudes towards computer adoption in teaching and learning. However, this differs from Mahajan (2016) study findings that some teachers had unfavorable attitude towards adoption of computers in teaching and learning. The overall mean for the teachers' and pupils' attitude towards adoption of laptops in education was 3.66. This implies that public primary school most teachers, agreed that teachers' and pupils' attitude was positive towards adoption of laptops for teaching.

The teachers stated ways through which teachers' and pupils' attitude towards adoption of laptops in learning and teaching can be improved. They asserted that this could be enhanced through provision of adequate laptops, training teachers and creating more time for attending computer lessons. They also stated this could be attained through sensitization and teaching the importance of learning and teaching using computers. This could improve teachers' attitude towards use of computer in teaching which Mahajan (2016) argued to be the most prominent factor amongst the factors that influence the fruitful adoptions and implementation of computers in the teaching space.

Overall Mean Ratings

The overall mean ratings were computed as shown in Table 9. According to the teachers, teachers' and pupils' attitude had the highest (4.17) rating on the preparedness of schools on embracing of laptop in teaching and learning. This was followed by adequacy of technical support (2.61). Teachers' competency had the second lowest rating (2.45) while adequacy of infrastructure had the lowest influence (2.01) on the preparedness of schools on adoption of laptop in the education process. This implies that instructors and pupils are prepared in terms of their attitude to adopt laptop in teaching and learning. This supports Haron, Hanafi, Ahmad, Zainal, Mamat and Yusof (2018) study which found that teachers generally had encouraging attitudes towards implementation of computers in learning processes. However, the results do not reach agreement with Mahajan (2016) study which found out that 25% of the teachers had only favorable attitude towards use of technology in teaching. However, in overall terms public primary schools are largely unprepared to adopt laptop in teaching and learning.

Table 80: Overall Mean Rating

Factor	Rating
Adequacy of infrastructure	2.01
Teachers' competences	2.45
Adequacy of technical support	2.61
Teachers' and pupils' attitude	4.17
Mean of the three factors	2.81

SUMMARY

The objective of the study was to investigate teachers' competences in adoption of ICT for learning processes in public primary schools in Abothuguchi West Division. The study recognized that majority of teachers in public primary schools had a basic training in computer and basic knowledge in computer use and its applications. The results also indicated that teachers could not competently use computers to prepare schemes of work, teaching materials and could not competently use a computer to teach with aid of a projector. The study further established that majority of teachers were not competent in the use of internet to access teaching materials. It was also established that only a few teachers could install a printer and new software to a computer. The study further established that majority of the teachers lacked competency in operating word processing program, data base program and spread sheet programs and using World Wide Web to access information. The overall results indicated that public primary schools were largely unprepared in terms of teachers' competency in adoption of laptop for teaching and learning.

CONCLUSIONS

The study therefore concluded that:

i Public primary schools in Abothuguchi West Division were largely unprepared in terms of adequacy of infrastructure in adoption of ICT in education processes.

ii Public primary schools in Abothuguchi West Division were largely unprepared in terms of teachers' competency in adoption of technology for learning and teaching.

iii Abothuguchi West Division Public primary schools were largely unprepared in terms of adequacy of technical support in implementation of ICT for learning and teaching.

iv Teachers and pupils in public primary school in Abothuguchi West Division had a positive approach to adoption of ICT for learning and teaching.

RECOMMENDATIONS

Based on the study results the following recommendations were made:

i The Ministry of Education should escalate funding of the laptop project to ensure adequate provision of infrastructure to enable usage of laptops in learning and teaching

ii The Ministry of Education should organize for in-service training and compulsory computer training in teachers training college to improve competency of teachers in the use of computers in teaching and learning

iii The public primary school managements should hire a computer technician to provide technical support to teachers

iv Pupils and teachers should continue being sensitized on the usefulness of ICT in teaching

v A parallel research should be done throughout the country to understand school preparedness for adoption of laptops in education.

vi A study on impact of ICT curriculum used in Teachers Training Colleges on adoption of Computer should be carried out.

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