Teacher Skills in Computers in Primary Schools in Kenya that Can Enable Them, Use Computers as a Pedagogical Tool, a Case of Kakamega Central Sub County, Kenya

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Abstract:
The use of computers in teaching has become mandatory in most countries in the world. The Kenyan as country wants the program rolled from primary school level. As the government plans to introduce the use of computers in primary schools, the study, Teacher skills in computers in primary schools in Kenya that can enable them, use computers as a pedagogical tool, a case of Kakamega central sub county' sought to establish whether the teachers were prepared to use the computers as a pedagogical tool in the learning process. This study employed descriptive survey design. Stratified sampling technique was used. Stratified sampling ensured that all primary schools in Kakamega Central sub-county are sampled and categorized on the basis of them being public or private, in municipality or Lurambi division. A purposive sampling was used to draw a sample from each subgroup in a sampled school. This translated into a sample frame of 46 Head teachers, 46 senior teachers, 46 female teachers and 46 male teachers, 46 boys and 46 girls, giving a total of 276 respondents. Saturated sampling was done to obtain the head teachers and senior teachers from the sampled schools. Random sampling was then done to obtain the male teachers, female teachers, boys and girls from the sampled schools. The study focused on questionnaires which were administered to the respondents, and interview schedules with the administration. A Pilot study was done using 12 schools from Kakamega East Sub County, and then data analyzed was to determine the reliability Coefficient. A reliability coefficient of $\alpha = 0.9$ was obtained and accepted since it was above 0.7, as an acceptable value. The data obtained was analyzed using descriptive statistics and presented in frequency tables, bar charts and pie charts bringing out both the quantitative and qualitative of the Teacher skills in computers in primary schools in Kenya that can enable them, use computers as a pedagogical tool, a case of Kakamega central sub county' in the teaching and learning process. The result showed that 89 % of the teachers lacked the necessary skills to teach using the computers.

Keywords: Computer, Pedagogical tool, School infrastructure, Preparedness, Learning

1. Background of the Study

Countries in the world like USA, Canada, Haiti, Rwanda, Afghanistan, Brazil, Uruguay and South Africa use computers in education from very low levels equal to primary schools in Kenya. The government, Kenya, introduced the use of computers in the ministries in 1970's (Ford, 2007). The use of internet was availed in 1993. According to Mweu (2000), the first commercial internet service provider (ISP) began operating in 1995. It was around the same period that many Ministries in Kenya started embracing the use of computer, specifically for administrative purposes.

In the education sector, computers were introduced in public secondary schools in 1996 for the students to learn computer literacy skills. This introduction of computers in education was funded by the United Nations Educational, Scientific and Cultural Organization (UNESCO). A policy on the curriculum approving the teaching of computer education in secondary schools and making the subject to be examined from 1998 was developed and published in 1997 by the Ministry of Education (MOE). The teaching materials, like the computer syllabus, were then developed by the Kenya Institute of Education (KIE) and supplied to schools. Physical facilities like the computer laboratory were to be put up by the schools. Colleges were mandated to train teachers in computer education. Emphasis was put on training of the teachers who would teach computer as a subject and not as a means of teaching and instruction. Other teachers who taught different subjects were not trained to use computers. The teachers who trained in computer education were not trained on how to use the computer as a means of instruction, but only to teach how the computer is used. The need to access computer skills kept on increasing; this need made the government to formulate a policy that would guide the process of ensuring that all Kenyans have an access to information communication and technology (ICT). For instance, the Sessional Paper Number 14 of 2012 states in part: "The Government recognizes that an ICT literate workforce is the foundation on which Kenya can acquire the status of a knowledge economy by 2030. Against this background, the Government shall make education the natural platform for equipping the nation with ICT skills in order to create dynamic and sustainable economic growth. To this end, the Ministry will continue to supply ICT equipment, develop content and facilitate training of teachers on ICT. Additionally, the interactive e-learning aims at mainstreaming ICT as a tool for teaching and learning." This paper recognized that, to have alliterated workforce, there was need for them to have ICT knowledge and the best way to do so was to introduce it in the education system. It was against this background that the Jubilee team (a four party coalition established to support the joint presidential elections ticket of Uhuru Kenyatta and William Ruto in the 2013 Kenya general elections) released its campaign manifesto and among its promises was to provide free lap tops to Class One if they won the election. They eventually won the election. After forming the government, it became a promise to the Kenyan children. They immediately embarked on the process of ensuring that the promise is fulfilled. Their concentration was to provide the laptops in the education system at primary level. However, they failed to follow some procedures that would pave way for the introduction of the computers in the education system. For instance, they should have then provided a structure for the decision-making processes to help actualize the objective to introduce computers into the primary educational system; they should have started by drawing from the experience of a few experts in the area of computer education. This step was critical for two reasons: according to Education and Technology Series, Vol. 3, No. 1, 1998. First, weighty decisions would have been taken, and the wisdom required for these decisions, upon which the success or failure of these projects depends, could not exist without serious knowledge of the subject matter; second, without this high level of knowledge on the buyer's side, the influence of the professionals employed by the sellers (whose advice may be biased for commercial reasons), may be undesirably high. After the views of the experts the Kenyan government would have then formed an Advisory Committee. This Advisory Committee could have included local experts who would contribute their knowledge and expertise in the areas of education, computers and computers in education, evaluation, economics and planning. These experts would represent a wide range of interests/organizations i.e., the Ministry Educational of Education Science and Technology, Ministry of Information Communication and Technology -particularly in the financial aspects, universities, teacher's colleges, schools of education, and educational institutions and those who have experience in the use of computers for instructional purposes. The committee may have been expanded so to include members from international consultants of recognized expertise in the area of computer technology, especially its application in the teaching and learning process at low grade level equal to the primary school level in Kenya. There should have been debates on the same issue through conferences; by inviting local or foreign experts to give lectures or seminars; by attending relevant conferences; creating a data bank of information that will support the decisions required to define the Plan, sending some of the Committee's members to visit successful projects in the Region/neighboring countries, or even in foreign countries with long-term experience in the area. (Education and Technology Series, Vol. 3, No. 1, 1998). This was not done, but the government was determined to provide the laptops to students in Kenya. There have been delays due to logistical issues and court case challenging the procurement process. (Mutegi, 2015). To overcome this hurdle, government resorted to borrowing from the Brazilian Educational Computer Project for Schools which was implemented with the support of UNESCO and found that this model had been used in India, Indonesia, and Nigeria then it could be replicated in Kenya (Kaimenyi, 2015).

In incorporating ICT in Brazilian education system, Brazil's Education Ministry established interactivity of TV content used in formal and distance education (Kaimenyi, 2015). If Kenya was to borrow from the program fully, it had to go through the stages above, just like the way the Brazilian government did. This was not followed by the Kenyan government.

A curriculum guide for ICT Integration in Education (2015), was been developed that would ensure that all teachers graduating from our public universities and teacher training colleges would have acquired the skills and attitudes that would make them use computers as a means of instruction. These guidelines were to be implemented in 2015/2016 academic year. The targeted teachers were majorly primary school teachers who would to be admitted in September 2015. It is expected that by the time they graduate in 2017, they will be able to use the computers as a means of instruction. For the practicing teachers there are in- service courses that are being mounted across the country. According Murule (2013) Kenya had trained 150, 000 teachers and were targeting an additional 300,000 teachers who would guide pupils on the use of laptops. There is a deliberate effort to equip the teachers with computer skills and to install our schools with electricity by the Kenya government.

According to the National Science Teachers Association Report of 1999 (NSTA1999), for the effective implementation of computers in Science education, teachers should know how to use effectively and efficiently the software provided in the computers, know how to incorporate microcomputers into instructional strategies, become familiar with the use of computer applications as management tools for grading, reports, inventories, budgets, exemplify the ethical use of computers and software and seek to provide equitable computer access for all students. The teachers need the above skills for them to be able to apply in other subject's areas. For the computers in this case, it will be used to teach as a means of instruction just like the chalk board is common to the entire subjects.

According to the curriculum guide for ICT Integration in Education in Kenya 2015, ICT is a major vehicle for teaching and learning from the earliest years. It is at a very young age that learners begin to acquire digital skills which they increasingly use to explore and exploit the world of information and to craft that information into knowledge. It further states that, ICT facilitates the opportunity for more student-centered teaching, more self-learning and more peer teaching. It also provides greater opportunity for teacher-to-teacher, and student-to-student communication, as well as collaboration and access to the worldwide web and the suggested teaching/learning resources.

The report by NSTA stated how the teachers should be prepared to enable the program to yield the benefits highlighted in the curriculum guide for ICT Integration in Education in Kenya 2015. In the MoEST (1996) it stated clearly the roles of the Ministry and the management of schools in the provision of the computer education to the secondary schools. The government has given a clear indication and made serious steps to have the dream of the introduction of computers to primary schools being actualized. Now there is need for serious preparation to be made to ensure that the dream is actualized.

1.1. Statement of the Problem

The ability of the teachers to use computers as a pedagogical tool will determine the success of the program which depends on the computer skills of the teacher. If the Advisory Committee had been put in place and felt mature enough in terms of having developed a common base of knowledge, and had reached consensus about the main objectives to be achieved, its second activity would begin: the definition of the Plan. In the Plan various stages would have been developed, with short, middle and long-term objectives, with each stage of implementation adjusted according to the experience learned from the previous stages. The first stage is the most difficult from a conceptual standpoint. Additional stages would deal mainly with the expansion of the previous ones to larger populations. There seemed to be many omissions at planning stages that prompted this study.
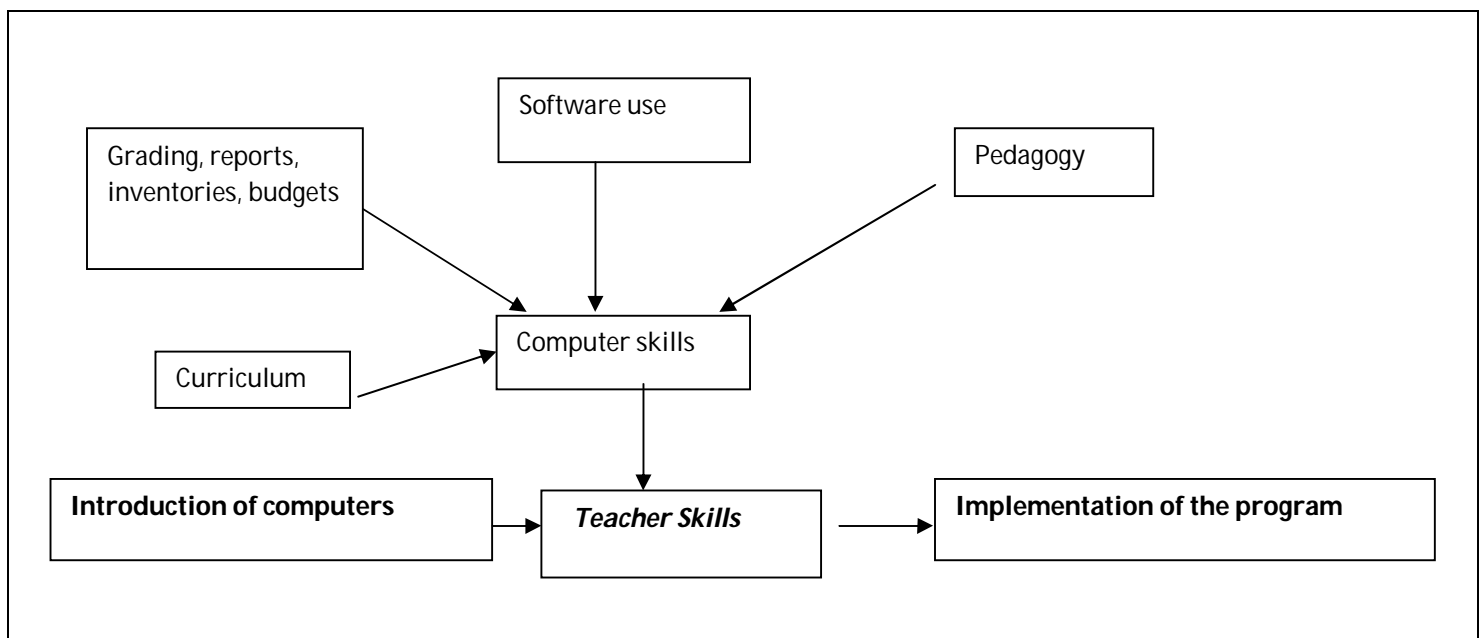
1.2. Conceptual Frame Work

Figure 1
Source: Author, 2016

1.3. Research Objectives

The purpose of the research was to determine the Teacher skills in primary schools in Kenya towards the use computers as a pedagogical tool. It aimed at Establishing whether the teachers had acquired the necessary **skills** that would enable them teach using the computers and also be able to perform general maintenance of the computers.

2. Results, Analysis and Interpretation

2.1. Necessary Skills Needed by Primary School Teachers to Enable them use Computers

ICT learning skills as the ability to collect and/or retrieve information, organize and manage information, evaluate the quality, relevance, and usefulness of information, and generate accurate information through the use of existing resources. According to the Transforming Education through Technology (2006), every teacher should have the following basic skills to be able to use the computers in the classrooms effectively and efficiently. The teacher should able to search the web efficiently, Master Microsoft office and basic word processing, be willing to learn new technology, connect with social media, share and collaborate via YouTube and blogging, unlock the potential of mobile devices, reach out with e-mail, make your presentation with the software, Google and get ahead in the cloud. The use of technology in the classroom can enhance learning; this is because there's a whole world of tools online that allow teachers to provide more skill-building knowledge than ever before. Teachers' use of a computer provides even the youngest students with early knowledge of necessary job skills, from typing and basic research, to learning graphic design and HTML coding. In turn, these skills prepare students to be exposed to new ways of thinking, using both their creative and logical thought processes.

The study sought to find out if the teachers had following: Booting a computer, Word, excel, PowerPoint presentation and internet use. Questionnaire were issued to the head teachers, senior teachers, male and female teachers and from the response rate, a total of 172 teachers responded as follows, head teacher (40), senior teachers (43), male teachers (45) and female teachers (44).

2.2. Booting a Computer

Booting a computer is the putting on and off of a computer. This was considered a basic skill that all the teachers were expected to have. The result below was obtained from research.

	Frequency	Percent	Valid Percent	Cumulative Percent
Booting a computer	17	9.88	9.88	9.88
not able to boot a computer	155	90.12	90.12	100
Total	**172**	**100**	**100**	

Table 1: Showing booting of a computer
Source: Author, 2016

The study revealed that 90.12% were not able to start or put off a computer. Only 9.88 % were able to do so. From the above table, it is clear that only 9.88% of the respondents are able to put on and put off a computer. 9.88% is very low as it is only 17 respondents out of 172 who can put on or off a computer. This indicates that the most of the teachers cannot perform simple maintenance of the computers especially when it malfunctions. The Figure 2 gives an illustration the above information.
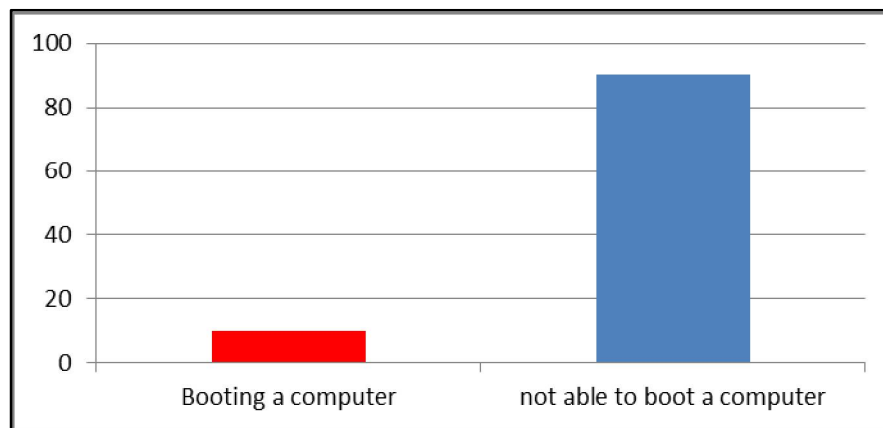

Figure 2: showing ability of the respondents to boot a computer

On further interviews with the teachers as to whether they had made a deliberate effort to acquire a computer for personal use, it was observed that it was the government role to equip them with the computers and not their responsibility.

2.3. Microsoft Office Word Application

The study sought to find out from the respondents their ability to use Microsoft office word program on the computer. Table 2 shows the results obtained.

	Frequency	Percent	Valid Percent	Cumulative Percent
Able to Use Word Program	14	8.14	8.14	8.14
Not Able to Use Word Program	158	91.86	91.86	100
Total	**172**	**100**	**100**	

Table 2: showing the use Microsoft office word application Program
Source: Author, 2016

The results showed that only 8.14 % of the total respondents were able to use Microsoft word program. 91.86 % were not able to use it. This is considered as one of the basic program any one has to learn. 91.86 % showed no skill in it. See Figure 3
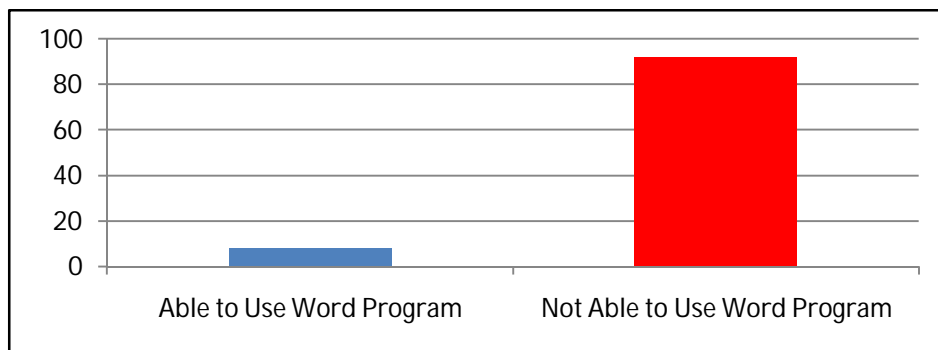

Figure 3: Showing the use of Use Word Program

The study sought to find out from the respondents their ability to use Microsoft office word program on the computer to make a lesson plan and the results below were obtained.

	Frequency	Percent	Valid Percent	Cumulative Percent
Non-Per Week	134	77.90	77.90	77.90
One Per Week	19	11.05	11.05	88.95
Five Per Week	13	7.55	7.55	96.50
One Per Month	6	3.50	3.50	100
Total	**172**	**100**	**100%**	

Table 3: Showing Use Word Program to make a lesson plan
Source, Author, 2016

It was further revealed through the interviews that those teachers who were trained by the government needed more time for training and that they should have been provided with computers so as to continue practicing what had been learnt. They also felt that they lacked the word processing skill. It was further revealed that 11.05% of the respondents had made one lesson plan using a computer per week; this translates to 2.24 % per day. Then if 7.55% of the respondents had made five lessons in a week then it makes 1.52 % per day, 3.55 % per month make 0.165 % per day. Then average lesson plans per day 1.31 %. This means that the percentage numbers of teachers who have not used word processing to make a lesson plan is 98.69%. This is almost 100% of the teachers interviewed were yet to use word processing program.

2.4. Microsoft Excel Program
The study sought to find out from the respondents their ability to use Microsoft excel program on the computer. The results below were obtained

	Frequency	Percent	Valid Percent	Cumulative Percent
Able to use Microsoft excel Program	6	3.49	3.49	3.49
Not Able to use Microsoft excel	166	96.51	96.51	100
Total	**172**	**100**	**100**	

Table 4: showing Use Microsoft excel program
Source: Author, 2016

The results showed that only 3.49% of the total respondents were able to use the Microsoft excel program. 96.51% were not able. This is also considered also as one of the basic program any one has to learn. 96.51% showed no skill in it. See Figure 4
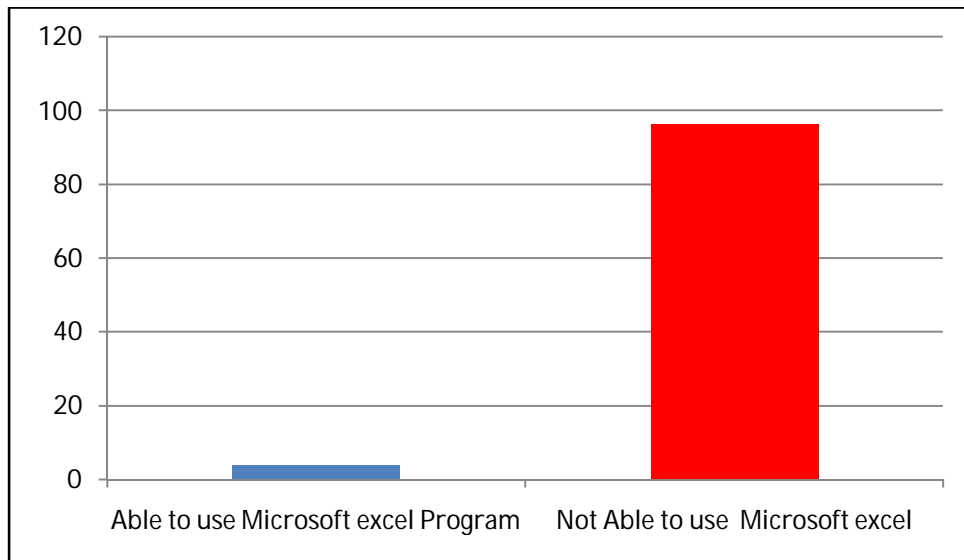
Figure 4: showing the use of Microsoft excel program
Source: Author, 2016

Excel program helps in doing mathematical problems from simple to complex. The 3.6 % respondents on further interviews indicated that they can only use for basic operations, like summation only.

2.5. Microsoft PowerPoint program
The study sought to find out from the respondents their ability to use PowerPoint program on the computer.

	Frequency	%	Valid %	Cumulative %
Able to use Microsoft PowerPoint Program	3	1.74	1.74	1.74
Not Able to use Microsoft PowerPoint	169	98.28	98.28	100
Total	**172**	**100**	**100**	

Table 5: Showing Use Microsoft PowerPoint program
Source: Author, 2016

The results showed that only 1.74% of the total respondents were able to use the Microsoft power point program. 98.28% were not able to use it. This is also considered as one of the basic program any one has to learn. 98.28% showed no skill in it. Results showed that 98.28% didn't know how to use power point. This meant that they can't also be able to use a projector. See Figure 5
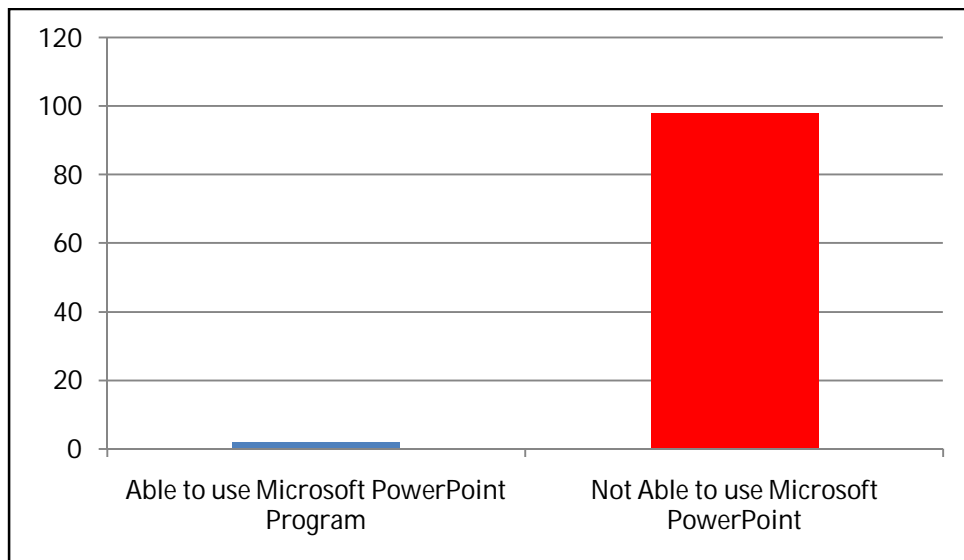

Figure 5: Showing the use of Microsoft PowerPoint program
Source: Author2016

2.6. Use of Internet on Smart Phones

The use of internet was established through the frequency of the teachers visiting the World Wide Web which was at 5 percent and it was through their phones. The study also revealed that 48.57 % spend about 5 hours per week on non-academic issues. See the Table 6

Number of Hours Spend on Non-academic Activities in Percentages (%)	
Non-Per Week	22.85714
One Per Week	22.85714
Five Per Week	48.57143
One Per Month	5.714286
Total	**100**

Table 6: showing the number of hours spent on non-academic activities
Source: Author, 2016

From the Table 6, 22.85714% of the teachers spend one hour per week on other computer activities apart from academics. This means that 3.266 % per day, 48.57143 % spend five hours per week meaning, 1.388% per day, one per hour month 5.714286, which is 0.190% per day. On average 1.615% spend an hour daily on other computer activities. 98.385 % of the teachers don't even spend an hour on other computer related activities on their phones.

2.7. Use of Emails in Communication

It was further revealed that 41.46 % of the teachers don't use email for communication purposes and 24.39024 uses it once per month, in addition 31.70732 % do not access world web and 21.95122 once per month. See Table 7

Number of Emails in Percentages (%)	
Non-Per Week	41.46341
One Per Week	17.07317
Five Per Week	17.07317
One Per Month	24.39024
	100

Table 7: Showing the number of email communication
Source: Author, 2016

The table above indicates that on average 2 .033% use emails daily. This still low especially now that the emails were on social issues and not academic collaborations. On academic collaboration it was zero percent. The study revealed also that 31.70732% don not access World Wide Web, See Table 8

Frequency of Accessing World Web in Percentages (%)	
Non-Per Week	31.70732
One Per Week	19.5122
Five Per Week	26.82927
One Per Month	21.95122
	100

Table 8: Showing the frequency of the Teacher accessing World Wide Web
Source: Author, 2016

Table 8 indicates that on average, 19.51% of the teachers' access www on weekly basis, and this 2.7 % per day. 26.82927 % per week this 3.833 per day and 21.9512% per month which is equal to 2.51 % per day. On average the 2.451 % access the World Wide Web while 97.549 don't have an access to it.

In an International Journal of Education and Research Vol. 2 No. 2 February 2014, another similar study was done in Cyprus by Dirckinck-Holmfeld, Hodgson, Jones, de Laat, McConnell and Ryberg Dirckinck-Holmfeld (2010) and the result showed that, curriculum and school manuals do not include ICT integration; there was lack of supporting materials for each learning unit. It recommended that Teachers, therefore, needed to spend excessive amounts of time to find, assess, revise and adjust learning materials, activities and tools to fit to the needs of their students and the curriculum. Peeraer and Van Petegem (2009), assert that important barriers to use of ICT in teaching and learning are the teacher educators' computer skills and confidence in using ICT. Research done by Charles Buabeng-Andoh Pentecost University College, Ghana identified barriers of effective integration of ICT in educations as; lack of teacher ICT skills; lack of teacher confidence; lack of pedagogical teacher training; lack of follow-up of new and lack of differentiated training programs. These results concur with situation in Kakamega central- Sub County.

3. Summary, Conclusions and Recommendations

From the conceptual frame work, the success of the implementation of the program lays on the skill of the teacher. If the skill level is below as shown above then the program may not take up as planned. This is because most primary school teachers lacked the necessary skills that can help them teach using computers as a pedagogical tool.

3.1. Recommendation

There should be in service courses for all the primary school teachers to enable them teach using computers.

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