Journal of Education and Practice www.iiste.org
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.9, No.21, 2018

Policy Framework for Inclusion of Technology in Preschool Education in Kenya: Stakeholders' Views

Odundo, Paul Amolloh, Ganira, Khavugwi Lilian, and Boniface Ngaruiya
Department of Educational Communication and Technology, University of Nairobi, Kenya.
Email: odundopaul@yahoo.com, kganira@yahoo.com & bngaruiya@unobi.ac.ke

Abstract
Inclusion of Information and communications technology, (ICT) in preschool education through formal policy framework forms a foundation for ensuring effective introduction and implementation into educational institutions. Effective policy frameworks convey meaningful relationships between objectives and organizational functions therefore discouraging divergence from planned courses of action. In countries where policy priorities in ICT exists in early childhood education (ECE) sector, learning through web use plays a crucial role in attaining knowledge, educational success, and social equity. However, in Kenya, policy and curriculum support for development of ICT in ECE sector has lagged behind. With inadequate policy frameworks and support, early childhood educators are likely to make own decisions about the nature and extent of ICT use in children's learning. This study examined policy frameworks for inclusion of technology in preschool education. A critical case sampling strategy was employed to select 10 key ECE policy stakeholders. Interviews for policy stakeholders and questionnaires for preschool teachers were used as instruments for data collection. Qualitative data were analyzed through transcription process, and theme identification. The study revealed that there are no institutionalized policy, curriculum guidelines and resources on integration of ICT in ECE programmes. Most of the participating stakeholders 90% felt that there was need for a national policy to guide inclusion of technology in ECE programmes, while100% of the participants felt that inclusion of technology in ECE programmes require adequate infrastructure including electricity, classrooms, ICT resources funds and manpower. The study recommends the Ministry of Education and policy makers to come out strongly to support curriculum guidelines for integration of ICT in preschool education.

Key words: Inclusion, Information and communications technology, preschool, policy frame work

1. Introduction

The ICT Education Policy in Kenya, a key element of the government's 2006 National Information and communication Technology Policy is the use of ICT in schools, colleges, universities and other educational institutions to improve quality of teaching and learning. The Ministry of Education introduced National ICT strategy for Education and Training in 2006 to guide implementation strategies in primary and secondary schools. Since then, Kenya has made incredible progress putting in place an ICT, complete with measurable outcomes and time frames. The process has had benefit of sound advice from officials and stakeholders and, perhaps more importantly, the Ministry of Education. While guidelines have been developed for integration of ICT in secondary and tertiary institutions, Plowman (2011) confirmed that incorporation and application of ICT policy framework within the learning process in ECE sector has received little attention. The delayed attention to ICT in ECE presents several shortcomings in the sector such as insufficient ICT literacy. As a result, there is little interest and concerted effort on part of the government, the ministry of education and development partners in investing in ICT initiatives in ECE. In addition, Geoffrey (2012) observed that collective implementation is challenging with inadequate resources, national ICT infrastructure, and even electrical supply particularly in the rural areas.In this regard, there is need for formal recommendations to pedagogical purposes for introducing technology, or the supporting conditions and resources that will enable technologies to contribute towards teaching and learning experiences in preschool education. As much as Oyier, Odundo, Ganira and Kahiga (2015) affirmed that schools are integrating ICT in management of finances, co-curricular activities and infrastructure in secondary education in Kenya, preschool curriculum has remained silent on implementation of technology in preschools. Further, supply of laptops to learners in standard one all over the country left out preschools, therefore creating a disconnection in policy supporting ICT integration in learning environments.

While there is evidence from school-sector research that ICT assists in effective teaching and learning, Tondeur, Coopert, and Newhouse (2010) emphasized that research has not revealed many examples in which the widespread rollout of ICT into schools has transformed teaching practice, or children's learning experiences in many meaningful ways. The evidence is clear that only providing ICT equipment to schools or teachers will not necessarily make a difference; what makes the difference is to narrow the mismatch between policy and practice. It is also essential to realize the reality on the ground and carefully analyze contents and potential impact of teaching and learning and the process that need to be adopted to ensure that children's learning experiences are realized, Stephen, McPake, and Plowman (2010). In many developed countries, heavy investments have been made in ICT for use by teachers and children in early childhood education. In Australia, Early Years Learning Framework (EYLF) presents a supportive foundation for quality teaching and learning in early childhood settings. The framework has specific goals, and aims and learning outcomes targeted from birth to 5 years of age emphasizing the importance of communication and language development that include early literacy and numeracy with the use of ICTs, Burnett (2010). In advocating for ICT use in ECE, government of Malaysia has placed high importance in developing its early childhood services through preschool policy documents that identify inclusion of ICT as essential for attaining knowledge, educational success and social equity Fesakis, and Mavroud (2011). It is based on this background that the study explored policy framework for inclusion of ICT in early childhood settings in Kenya.

1.1 National Policy on Inclusion of Technology in ECE

Through a national ECE policy framework (Republic of Kenya, 2006a), the government identified several challenges resulting from lack of appropriate communication mechanism among ECE service providers. These challenges include hindrances to service (health and education) delivery systems for all children (including those with special needs) and families including the vulnerable and marginalized communities (Ibid, p. 33). In order to address these challenges, government documented policy statements outlining; use of ICT for effective communication in enhancing interaction among organizations, programmes and children's service providers; use of ICT for enhancing efficiency and quality of children's services in health, education and special needs education; use of ICT to support training programmes in ICT for the purpose of enhancing efficiency in provision of quality services in health and education for young children in vulnerable and marginalized communities (Republic of Kenya 2006a, p. 34).

An explicit recognition on use of ICT in ECE is documented in Sessional Paper No. 14 of 2012. In this policy paper, the government suggests that use of ICT in preschools could enhance teaching and learning, enable children to master ICT literacy skills for acquisition of knowledge, access learning resources, communicate and collaborate during learning. In the same paper, the government suggests the need to mobilize funding for introduction of appropriate technology skills that support children's play and psycho-motor development across all ECE centers in Kenya. At the same time, the government identifies non-existence of ICT curriculum at ECE and primary levels as one of the challenges facing the inclusion of the innovation in education (Republic of Kenya, 2012).Nonetheless, these suggestions and intentions are yet to be documented into specific frameworks on integration of technology in ECE programmes, including teachers' training programmes for ECE teachers.

1.2 Curriculum Guidelines on Inclusion of Technology in ECE

At the training level for pre-service preschool teachers, a number of course objectives on technology are documented in the syllabus for training preschool teachers at certificate level. These include trainees' acquisition of information relevant to ECE programmes; identification and development of materials using locally available resources; identification and utilization of local resources that promote social-economic development; being aware and appreciating the role of technology and industry in national development; acquire, adapt and apply technology in teaching and learning activities" (Republic of Kenya, 2006c p. ix). Notably, one of the course objectives in the syllabus for training preschool teachers at diploma level is to equip trainees "with knowledge and skills in developing and utilizing ECE instructional materials and strategies for programmes" (Republic of Kenya, 2006c, p. x). All these policy statements and more especially those focused on technology are not reflected in ECE educators' practices and children's learning at preschool level.

1.3 Inclusion of Technology in ECE.

During teaching and learning in preschools, teachers in ECE are provided with government guidelines, handbooks and syllabi in which specific instructional materials for children aged 3-6 years are outlined. These materials include seeds, flowers, leaves, pieces of wood, sticks, clay, chalk, chalkboard, easel board, crayons, glue, cut-out shapes, brushes, paint and cut-out numbers; papers, flash cards, charts, feathers, pencils, scissors, sand, containers, beads, picture books, photographs, models, magazines and newspapers (Republic of Kenya,

2008a, p.16); and balances, coconut shells, letters of alphabet, brushes, crayons, dolls, zip fasteners, buttons, strings, harmless insects, bean bags, balls, ropes, beams, boxes and plasticine (Republic of Kenya, 2008b, p.22). However, the guidelines do not have content that guides teachers' integration of digital technologies in professional daily practices. Furthermore, Odundo, Ganira, and Shaji (2017) indicated that ECE teachers in Kenya have limited access to digital technologies due to non-availability in ECE teaching and learning environments. As a consequence, there are discrepancies in integration of ICT as a pedagogical tool that enhances teaching and learning. Absence of a clear policy on use of ICT in ECE settings implies that implementation is left as a choice to teachers.

1.4 Professional training of Teachers and ICT integration

The need for professional training encompasses an entire understanding and complete mastery of ICT as a pedagogical tool, as well as determining if use of a specific technology is age appropriate, culturally and linguistically suitable. According to Phelps, Graham, and Watts (2011) ICT literacy emphasizes use of technology to manage, integrate, evaluate communicate information in order to develop information and communication skills required in the 21st century. In this regard, policies on developing teacher training should focus on promoting ICT literacy, research projects on effective use of ICT, as well as pedagogical practices that will enhance an appropriate learning environment. In addition, Lindahl, and Folkesson (20120 affirmed that integrating ICT proficiency is crucial for harnessing technology to perform and manage complexity, solve problems and think critically. Successful integration of ICT into classroom will depend on the ability of the teacher in structuring learning environment in new ways to merge new technology to direct socially active classes through encouraging co-operative interaction and collaborative learning. To be adequately prepared to support effective inclusion of ICT in ECE, Cviko, McKenney, and Voogt (2012) proposed that teachers need affordable and accessible professional development opportunities that include in-depth-hands on training, on-going support and access to the latest technology. Effective integration of ICT requires professional training and competency of teachers in technology use. Hence, Shaji, Odundo, Ganira and Mwanda (2016) affirmed that ECE teachers' selection of developmentally appropriate technology is influenced by professional training as well as type of ECE setting.

1.5 Sensitization and Awareness for Parents and Community on Inclusion of Technology in ECE

Inclusion of ICT in ECE requires sensitization and awareness for parents and communities including educators on potential role of technology. In today's technology-rich world, Plowman, Stevenson, McPake, Stephen, and Adey (2011) argued that parents need to be aware of what type of technology children are exposed. This may include knowledge on developmentally appropriate and active use of digital tools, media, and methods of communication along with learning in safe, healthy acceptable, responsible, and socially positive ways. In addition parents should be involved in careful evaluation and integration of materials and assist children in locating and choosing appropriate and suitable sources, resources, tools and applications. In instances where parental involvement and guidance is inadequate, teachers may make own decisions regarding nature and extent of and support offered to children. Lin, Wang and Lin (2012) offered evidence that technology tools improve ways in which teachers measure and record development, document growth, plan activities and share information with parents and families. Additionally, technology, through communication and media tools can be used to share a child's developmental progress with parents and families. When ICT integration is supported by policy frameworks in preschool education, there are high chances of; facilitating communication among ECE stakeholders, making work easy as it saves on time, facilitating research projects, enhancing teaching practice, enabling children to acquire ICT literacy as well as promoting socialization skills that contributes to efforts aimed at achieving Vision 2030, (Mauta and Margaret, 2014).

2. Statement Problem

The interest in ICT integration in preschool settings comes at a time when there is a growing desire to prepare children for an increasingly complex and technological world. Widespread support for value of technology in educational settings and creation of knowledge base economy has legalized a number of developed countries to invest heavily in ICT for use by teachers and children in ECE. For instance in Malaysia, long – term plan Vision 2030 aims at sustained product driven growth that is achievable through a technologically literate society and a workforce who can undertake critical thinking. In countries where policy priorities in ICT exists, Downes, and Beecher (2001) indicated that preschool teachers collaborate to share ideas and resources online, children develop valuable research skills at a young age, and there is plenty of resourceful as well as credible websites available on internet for both teachers and children to utilize. However, policy on integration of ICT in preschool curriculum is silent. Further, supply of laptops made preference to learners in standard one, leaving out

preschools. With absence of policy framework, educators at preschool are at risk of making inappropriate choices and using technology with children in unsuitable ways that can negatively impact on learning and development. To address this concern, there is need for a national policy to guide in curriculum plan, resource mobilization, professional training and sensitization and awareness of parents and the community on the need for including technology in the preschool setting.

3. Purpose and Objectives

The purpose of this study was to examine policy frameworks for inclusion of technology in preschool education. Outcome from this study will provide framework to guide policy makers and practitioners in ECE sector on ICT integration strategies that will effectively sustain children's learning and development. The objective is to determine what policy frame work advocate for integration and implementation of ICT in preschool education.

4. Theoretical Framework

The study was anchored on Technology Acceptance Model (TAM) of Davis, (1989). This model explains how individuals' perceptions affect perceived usefulness, adaptation and use of technology. The model proposes that when a user is presented with a new technology, a number of factors influence decision making regarding how and when to use it. This includes perceived usefulness, external variables, perceived ease of use, attitude towards using technology, behavioral intention, actual system, and its functions. The theory assumes that perceived usefulness would enhance an individual's performance, and beliefs of using technology. For this study, effective adoption of ICT in preschool education requires policy framework and implementation strategies. Since learning institutions and other organizations progressively intend to expand into global markets it is vital to identify how ICT facilitates teaching and learning, Ashbolt, (2009). In regard to these, ECE is in dire need of a uniform policy and institutional framework to curriculum guidance, ICT resources, professional training, in addition to sensitization and creating awareness to parents and communities on the potential impact of ICT in teaching and learning.

5. Conceptual Framework

Concern for inclusion of ICT in preschool education highlights the influence of technology use in the early years on cognitive and emotional needs of children in all aspects of life. Providing a flexible and responsive learning experience frequently requires advocacy and networking in order to formulate effective policy frameworks that will support inclusion of ICT in preschool education. This would be anchored on curriculum guidance, ICT resources, professional training, as well as sensitization and creating awareness to parents and communities on the possible influence of ICT in teaching and learning. Appropriate use of ICT policy in preschool education can help shift emphasis from teacher oriented learning activities to learning needs of an individual child in terms of improved communication skill, enhanced teaching learning practices, improved learning and socialization, sustained ICT literacy and social equity.

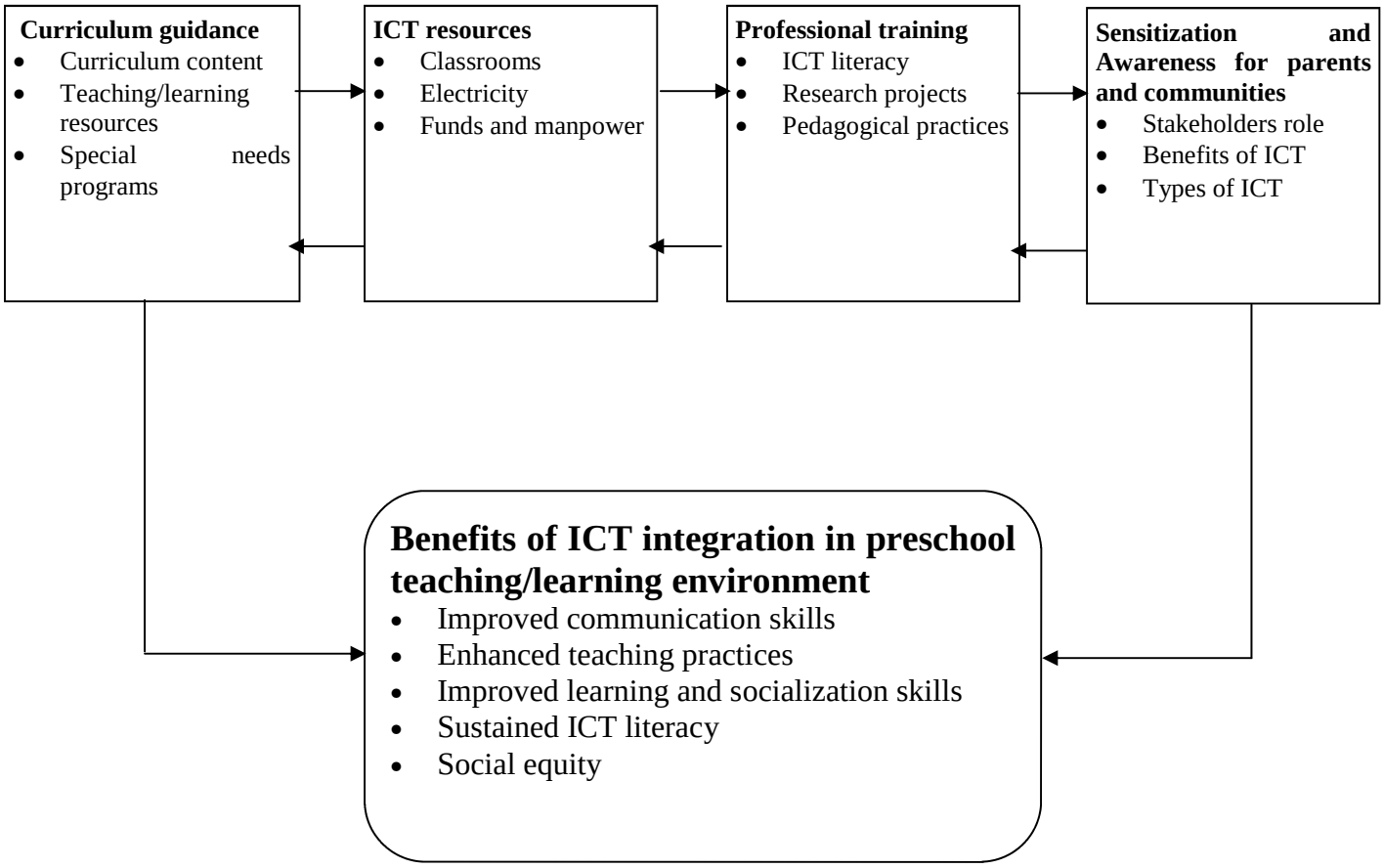

Figure 1: conceptual Framework on inclusion of ICT in preschool education

6. Methodology

A critical case sampling strategy (Patton, 1990) was used to select 10 ECE stakeholders for participation in this study. Patton (1990) supports this kind of consideration in a sampling process by stating "critical cases are those that can make a point quite dramatically or are, for some reason, particularly important in the scheme of things" .The 10 stakeholders interviewed were drawn from key organizations in Kenya involved with ECE policy, curriculum design and development, as well as those involved with implementation of the curriculum, that is, practice. Table 1 presents three categories of these key organizations

Table 1*:* Key ECE Organizations in Kenya

Organizations	Responsibilities/Focus	Initials and Numbers
National Policy (NP)	Design of the National ECE policy	(NP01)
Curriculum Development (CD)	Development of curriculum, teaching and learning resources for ECE at both classroom and training levels	(CD01, CD02)
Teacher Preparation (TP)	Training of ECE teachers in colleges and universities at certificate, diploma and degree levels; also, training of teachers in special needs education (SNE)	(TP01, TP02, TP03, TP04, TP05, TP06,& TP07)

Seidman (2013) believes that "the primary way a researcher can investigate an educational organization, institution, or process is through experience of individual people, the "others" who make up the organization or carry out the process". Hence, a semi-structured interview with 10 key ECE policy stakeholders enabled this study to explore in depth participants' views regarding use of ICT in ECE settings**.** Qualitative data was generated in the two phases of this study. This strategy was aimed at seeking corroboration Smith, Davidson, Cameron, and Bondi, (2009), among sets of evidence collected.

All the qualitative data collected in the two phases were analyzed through transcription process, theme identification, searching for patterns, Bernard and Ryan (2010) within each participant's evidence as an individual and also across different groups of participants involved in each phase of the research. Fereday and Muir-Cochrane (2006) describe thematic analysis as "a form of pattern recognition within the data, where emerging themes become categories for analysis". This approach enabled the analysis of both individual perspectives as well as the perspectives of groups of participants on the use of ICT in ECE settings in Kenya.

7. Study Findings and Discussion.

These are findings obtained from interviews conducted with early childhood development education (ECE) stakeholders also in Phase Two. The main purpose of including stakeholders in the study was to identify views on policy, curriculum and practice related to integration of technology in ECE programmes in Kenya.

7.1: Views on Inclusion of Technology in ECE Policy, Curriculum and Practice

Stakeholders (n=10) were asked to provide views on inclusion of technology in ECE policy, curriculum and practice. The stakeholders' views provided on this item focused on requirements and potential benefits of including technology in ECE policy, curriculum and practice.

7.1.1 Requirements for Inclusion of Technology in ECE Policy, Curriculum and Practice

Stakeholders were of the view that inclusion of technology in ECE required a national policy, curriculum guidelines, resources, professional training for teachers and sensitization and awareness for parents and communities. Table 2 presents these requirements.

Table2.*Requirements for Inclusion of Technology in ECE Policy, Curriculum and Practice*

	N=10	
	Stakeholders	
Requirements for Inclusion of Technology in ECE Policy, Curriculum and Practice	No.	%
Need for a national policy on inclusion of technology in ECE	09	90
Need for curriculum guidelines on inclusion of technology in ECE	08	80
Inclusion of technology in ECE requires resources	10	100
Inclusion of technology in ECE requires professional training of teachers	06	60
Sensitization and awareness for parents and communities	04	40

i. National Policy on Inclusion of Technology in ECE

Most of the participating stakeholders (90%) felt there was need for a national policy to guide inclusion of technology in ECE programmes both at preschool (including special needs programmes) and teachers' training levels. This view was articulated strongly by three (3) of the participants involved in curriculum development (CD 01) and teachers' training at university level (TP 04, & 05). These participants' articulations are presented in following excerpts:

> *(CD 01....So I think policies are made at a given level, it is the Ministry's work to come up with the policies. And there must be a policy at a national level to guide the use of technology. If they say it is compulsory to use IT in your instruction, all of us will go and learn the new technology. But now that it is left for you to choose which mode to use because they are unable to provide the requisite infrastructure for training then you don't. But as they are coming up with the policies now, are we talking of now ICT let's say in the university or at the preschool level?*

(TP 04)...*I think it is an area which the policy should address because as we are moving on, we are in the stage of technology at a greater advancement in technology and our children at that very early age should be given an opportunity to access or learn this technology, embrace this technology at the very early age because now we are in … in a kind of a competitive world. It's like global trend now require that we cannot compete with countries if we are behind and this should be developed right from the ECE stage so that we don't have a situation where as other countries that we are doing business with have already moved to the high level of technology and we are at a very low, a stage we are not then it will be disadvantaged to the children as they grow up in the education ladder.*

(TP 05)...It is now or never! If I am asked the way you are asking me, I would say right now, in fact it was supposed to have started yesterday. Yaah! We are not going to wait anymore because we are not going to be, to allow ourselves to be overtaken by events. We are.... we are talking about eh... for example we were being told tweeter and face book and whatever were introduced to all children in the world in less than two years. And now we were challenged, where are our Kenyan children going to be after ten years? Because these things were introduced at the same time: tweeter, face book, and name it. But even face book very few teachers know about it. So we are saying these things we are late, we are late comers. So we cannot afford to wait. If anything, government should do something, policies; good policies should be put in place.

ii. Curriculum Guidelines on Inclusion of Technology in ECE

Majority of the participants (80%) were of the view that there was need for a national curriculum to guide integration of technology in ECE programmes both at preschool (including special needs programmes) and teacher training levels. These views are supported by the following excerpts from participants' responses:

(NP1)...Umm eh well truly speaking as in the first place we don't have any guideline as of now as I had said earlier but eh If anything comes up like a guideline for ICT we would like to implement as soon as it is possible.

*(TP 02...*I think ICT is the way to go and ....many people especially in Kenya are still illiterate in IT. So if we include it in our curriculum from preschool to classes of higher learning, we shall be able to articulate issues in education.

(TP 03)...Now first there is no direct policy that supports inclusion of technology in early childhood education. The policy is lacking at teacher training level and implementation level. There is no direct policy that approaches that. Again in curriculum development there is just a broad policy on IT for the country which has not directly been domesticated to the classroom.

(TP 05)...Curriculum development, the curriculum itself has not integrated the use of ICT in instruction at classroom at teacher training level even the inspectorate level. So that makes it difficult for integration. The curriculum itself does not allow this because it is not in-built with technology at all levels. Secondary is not in-built, university is not in-built except a few universities like ..., those ones everything you do is with IT. So the teacher training is not integrating technology, making it very difficult for the teachers even if they have their own laptops and so on to use technology at the instruction level.

iii. Inclusion of Technology in ECE Requires Resources

All the participants (100%) were of the view that inclusion of technology in all ECE programmes both at preschool (including special needs programmes) and teachers' training levels required infrastructure including electricity, classrooms, ICT resources, funds and manpower. This evidence is supported by the following response excerpts by participants.

We are talking about infrastructure; we are not going to integrate the ICT at that level if there is no infrastructure. I am talking about electricity, I am talking about the classrooms; we should be talking about ah laboratories, computer laboratories in schools. We have to make sure that schools are well equipped in order for them to offer those services. If they are not then we shall be wasting time.

(CD 02)...Because we are even moving towards digitalized curriculum content, the issue of ICT is not whether; it is just the question of when ... you know when we have the resources and when we have completely made good plans for the same. Good plans here involve having a budget in place, a curriculum that is digitalized and manpower.

(NP 01)...I think the major concern in Kenya is the infrastructure because you go to some places you find still there is no electricity. I have seen a case in Rwanda where we have done it. The primary school kids are not buying books but are going to schools with laptops. And I think we have a lot to be done in Kenya.

(TP 03)...The government should come in strongly and introduce the issue of computers at that lower level. It should be like Rwanda. Rwanda now computers it's, it's like a pen, in fact Rwanda it's like a pen, all schools' pupils each has a computer, a laptop. I am told there is a laptop and a computer. I am told each pupil has. In Kenya once that is done, we will have made a big step. And children will be very enthusiastic about it, and the teachers, even those who don't want to learn will learn it.

(TP 06)...The second thing is to address the issue of infrastructure for training institutions, which are awful inadequate. These training institutions need to have their own training ah infrastructure which they can use. And so long as we don't have that, the trainers will continue to have a big problem. Then the finance to buy eh, eh these, the equipment and what have you. That one is an issue and the government needs to set aside money for the same.Also one thing we normally have concerned about is we don't have the facilities, both infrastructures for this because even where we are training now we are training on some places which is not ours. So we are only here when the schools are closed. If the school decides to use this facility, you will the kind of problem we are going to face. And also the other facilities to use like the computers there are not even there. Those are the kind of business we would like to be considered.

iv. Professional Training of Teachers and inclusion of ICT in ECE

Many of the participating stakeholders (60%) felt inclusion of technology in ECDE programmes both at preschool (including special needs programmes) and teachers' training levels required training of teachers and trainers in use of the innovation in professional practice. This view is supported by the following excerpts:

Yeah! We have to build capacity in teachers may be through organising short courses for them on ICT and now ah ... after they are well equipped then that is when they come to plough back whatever they have learnt in schools.

(CD 02).....So what I feel is that... I believe ICT is important especially in early childhood and ... if it is to be used in the early childhood, teachers need to be trained how to use it and also facilities need to be availed.

(TP 04).....Of course the first thing is provision of resources. That is an obvious case that they must think about seriously. The second issue is giving more support to teacher training at that level which they need support through in-servicing.
*(CD 01).....*This is a vital skill that needs to be integrated in the day today learning to enhance effective teaching and learning in schools. ECE teachers need to be trained on the same to reduce their paper work.
(TP 06).....Provide workshops, seminars and conferences to enable teachers learn more about ICT.

v. Sensitization and Awareness for Parents and Communities

Lastly, few participants were of the view that inclusion of technology in ECE would require sensitization and awareness for parents and communities including educators on the importance of the innovation and their potential roles. This data is supported by the following participants' quotes:

At ECE level there will be need to sensitize and involve the local community, parents and other people within the community area to recognize the value of technology, even at home to support children in acquiring technology that is ECE level. Most of them are able to use the technology already even at the rural areas but you know in urban is not a problem because most parents are doing it. You buy a laptop

in the house everybody is using it. They have what we call mobile phones and these mobile phones nowadays are so, they have these complex ones.

(CD 01)...We are talking about the, the social status of most of our families. So, we are not just going to assume that it's going to be embraced. Capacity should be build; communities should be mobilized to embrace the issue.
(CD 02)...Ah I think the most important thing is to consider the preschool teachers, their background, because most of the teachers who come to train in these institutions are coming from a very poor background. So one thing they have to consider is how are they are going to help these teachers to reach that reality that may be we need this technology not because of financial gains, that we need to develop this so that they can also go and use it preschools.

(TP 02)...Then at teacher level or trainer level people still perceive the use of technology as something belonging to the young generations. That perception makes the senior members of the profession not to adopt IT. In fact they don't have even initiative. So in practice, the limited use is also due to the unwillingness of the practitioners to use IT.

7.2: Inclusion of Technology in ECDE Policy, Curriculum and Practice

Six stakeholders (60%) were of the view that the use of technology in ECE could facilitate: communication among ECE stakeholders; make work easy, improve efficiency and save time; facilitate research projects within the ECE sector; enhance teaching practice; enable children to acquire ICT literacy skills at an early age; promote children's learning and socialization skills; and contribute to efforts aimed at achieving Kenya's set goals for achievement of Vision 2030. This data is presented in Table 3.

Table 3:*Potential Benefits of Including Technology in ECE Policy, Curriculum and Practice*

N=10

Potential Benefits	No Participants with this View	%
Facilitate communication among ECDE stakeholders	01	10
Make work easy, improve efficiency and save time	03	30
Facilitate research projects within the ECE sector	01	10
Enhance teaching practice	02	20
Enable children to acquire ICT literacy skills at an early age	03	30
Promote children's learning and socialization skills	05	50
Contribute to efforts aimed at achieving Kenya's set goals for achievement of Vision 2030	03	30

Ah..... it is..... It is a positive move to introduce technology in ECE..... ECE policy, curriculum and practice in that it leads to improvement of..... of efficiency of work, one. Secondly, proper time management in terms of saving time, ah..... thirdly, it hasten communication among the stakeholders and also it enhances an easier research projects within the ECE sector.

(TP 07).....Technology makes it easy and efficient for teachers to prepare instructional materials, schemes of work and lesson plans. Also in teaching, for example when teaching about shapes, colours, numbers and letters of the alphabet, etc. Technology is the best as it provides easy work for ECE teachers. It is faster and saves time. It also enables learners to explore technological devices which make them well equipped about the devices and what revolves around them.

(TP 05).....Technology is good and makes work easier for teachers. One does not spend time improvising teaching and children's learning materials. A teacher can download and print these materials from the website by browsing the Internet. Technology makes one explain concepts to children in a better and effective way. Children can as well play games on computers while the teacher prepares for non-computer lessons that are to be taught next.

(CD 02).....I think it is an area which the policy should address because as we are moving on, we are in the stage of technology at a greater advancement in technology and our children at that very early age should be given an opportunity to access or learn this technology, embrace this technology at the very early age because now we are in a kind of a competitive world. It's like global trend now require that we cannot compete with countries if we are behind and this should be developed right from the ECDE stage so that we don't have a situation where as other countries that we are doing business with have already moved to the high level of technology and we are at a very low, a stage we are not then it will be disadvantaged to the children as they grow up in the education ladder.

(CD 01).....People have been having negative thoughts about use of mobile phones at very early age, computers and the internet at very early age but they are now realizing the benefits. There has been an increase now in the use of social media which in other countries starts from the early level. You find children have access to face book, the twitter, it is good to introduce that technology as early as possible. We know the negatives which people have been emphasizing but the positives are much more.

We are heading to, we are talking about globalization, we talking about Vision 2030 in our country; and we are talking about where we want to be in Kenya. Yeah! We are talking about achieving the objectives we have set for our Vision 2030.

(TP 03)...The use of technology helps the children get a lot of communication skills e.g. Internet. So, it should be introduced as a lesson in most ECE centers. Use of IT is very effective in that, it will improve the learning skills of children at ECE centers.

(CD 02…So what … what I say is that we will have no choice but bring, that aspect of technology in the early childhood education, ECE. Because even in the Vision 2030 is emphasized that inthe education aspect, educational function ah … as a social aspect of development towards achievement of Vision 2030, technology is emphasized; science, technology and innovation at the education level starting from the lower level planning at ECE up to University. So we cannot leave it out otherwise we will not be achieving what Kenya is intending to achieve at least by the year 2030 onwards. In fact to achieve the so called 2030 goals we need a lot of ICT, in particularly from the basics. I mean from early childhood level.

7.3: Availability of National and Institutionalized Policy Guidelines on the Integration of Technology in ECE Programmes

Stakeholders and interested parties (n=10) were asked if policies, curriculum guidelines and curriculum resources were availability in their institutions of professional practice. Where participants responded with 'none', a follow-up question was asked if there were plans in place for availing of policies, curriculum guidelines and curriculum resources. Data collected on participants' responses to this question are presented in Table 4.

From findings in Table 4, three participants (30%) indicated that institutions had general policies related to use of ICT while only 1 participant (10%) said institution had prepared ICT or electronic curriculum resources for preschool children's acquisition of life skills(CD02).Evidence by these 4 participants' is supported by the following response excerpts:

Sessional paper No. 5, ICT policy by the Ministry of Education and ECD: Addresses ICT in the entire education system and this means ECE is included.(NP01).....We have developed curriculum that is supposed to be used both in private and also in public ECDE centres. Now, we are in the process of developing……, ICT and electronic materials that can supplement teachers' efforts in implementing curriculum in various centres. We have…..programmes developed on early childhood activities in several areas including mathematics, language, social, creative, music and movement, physical outdoor, which can be used by teachers. … Yes, so we have not done very well or we have not gone very far but at least we have started, we have the DVD''s, we have life skills programmes, which is in form of storytelling where children can learn life skills, particular life through video storytelling. For example last year we developed a puppet, a story telling puppet where children can learn mannerisms, and we went round and piloted the programme which was received very well.

Table 4:*Availability of National and Institutionalized Policy Guidelines on Integration of Technology in ECDE Programmes*

N=10

Participants	Availability of institutionalized policy/curriculum guidelines & resources on integration of ICT in ECE programmes	If none, plans in place for institutionalized policy/curriculum guidelines & resources on integration of ICT in ECE programmes
NP01	Sessional Paper No. 5 on ICT in the entire Kenyan Education system	None
CD01	Not sure	None
CD02	ICT or Electronic Materials for preschool children's acquisition of life skills	-
TP01	None	None
TP02	None	None
TP03	Yes but not well articulated	Yes
TP04	General , all students in the institution are provided with basic skills in computers	None
TP05	None	None
TP06	None	None
TP07	None	Yes

(CD02).....Mm…mm …….. Yes we have a policy but not very well articulated because of lack of personnel. That is one hiccup that we are encountering at the moment. But the council has appointed a team to do ICT needs assessment. Thereafter we shall see how we are going to implement this because it is now compulsory that we integrate ICT with education.

(TP04).....Ok in fact now what I have said is just general, eh what the university has is general for all the departments because as I have just told you, the ICT course is offered to all students. They introduce at least they get the basics of a computer, meaning they can be able to use it and in case if there is…… ah… they are in a school where the computer is, I believe they can.. they know basics that they can use even to instruct other children, to instruct children with. But now specifically for the department, we don't have any specific for the department, is general for all the departments.

Further analysis in table 4 shows that 50% of the participants said there were no institutionalized policy/curriculum guidelines and resources on integration of ICT in ECE programmes in their areas of practice. Evidence by these 3 participants' is supported by the following response quotations:

……Ok we discussed that issue with the staff but we had a lot of hindrances given that this is a college depending on money that is paid by students. So due to finances we thought that maybe we cannot take off. And we thought may be one time we discuss with the director of basic education. (TP02).....At ... university there is no policy! There is no policy! In fact the teaching is still…. eh…. teacher training approach is still based on ….. On teacher centered instructional methodologies. It is not IT based since IT itself is not there ……even the teachers do not have laptops in offices. The network accessed to internet in the offices is very weak, so ….use of this may… may not be strong enough. At University level there are no policies because the University draws its guidelines from national policies of education. But we have one of the most best established IT centers in public universities though it is only used by those who are doing science based courses mainly computer engineering, computers science, IT. But this has not been translated to education, especially ECE, it not there because the students also are not even able to access computer labs. We have computer labs yes, but they have five or so …. Twenty computers against a student population of a thousand, so it can't work!

Lastly, as shown in Table 4, a total of 7 respondents, (70%) including 4 whose institutions had general policies on use of ICT did not have plans in place for availing institutionalized policy/curriculum guidelines on integration of ICT in ECE programmes.

7.4: Timeframe for adoption of technology included ECE policy, curriculum and guidelines

During interviews, stakeholders were asked views on the time frame for adoption of technology integrated ECE policy, curriculum, guidelines and resources. These participants provided 5 types of responses including lack of support for the idea, 'now' response, and 'as soon as it is possible, 'ought to have been yesterday' and 'in the next 5 years'. This evidence is presented in Table 5 and supported by quotes presented after the table.

Table 5: ***Stakeholders' Views on the Time Frame for Adoption of Technology Integrated ECE Policy, Curriculum and Guidelines***

	N=10	
Views on Timeframe for Adoption	No. of participants with the views	%
I don't support the idea	1	10
Now	2	20
As soon as it is possible	2	20
Ought to have been yesterday	4	40
In the next 5 years	1	10
Total	10	100

Um….mm I think it ought to have been yesterday but it should be now; it is only that a lot of things have not been put in place, for instance finances and human resources. So if we delay beyond now we will be caught up by time because the world is a global village and the moment we are ICT compliant is the moment we become part and parcel of that village. If we don't we are going to lag behind.

(NP01).....Umm eh well truly speaking as in the first place we don't have any guideline as of now as I had said earlier but eh……. If anything comes up like a guideline for ICT we would like to implement as soon as it is possible. As soon as now if we get the guidelines and may be the monetary issues or the finances.

(TP02).....Ah I think it should be done now. It should be treated with some urgency because you know we can't stop technological advancement.

(TP04).....Yesterday! But given the limitations, the economic limitations, the increasing poverty levels, the worsening cost of living and so on, it has become difficult for the government and even the individual teachers to prioritize use of technology in instruction. So the micro economic situation is so weak that people tend to focus more on subsistence rather than investing in this area. Like I can't spend seventy five thousands to buy an ipad to go and teach ECE.

(TP05).....Ah ……. at the moment the structures at the lower level, at ECE level are still not very strong in terms of technology, but ah …… this is not a case where we can wait because you find in certain schools especially private schools already have this ah ……. in urban areas even in rural areas where you have those special schools they already have it and ……. there would be no …….. ah ….. we cannot say that we hesitate if there is an opportunity if we can be able to get resources it can be introduced as immediately as possible. Because one thing is that the ….we … we expect to go for curriculum needs assessment, curriculum review ah … towards the end of this year and the moment this is done so we cannot wait for five years, the moment this is done there will be curriculum development from ECE up to the eh…. I mean teacher training colleges. So we cannot wait, this will be a requirement that we will not wait for five years at this time. So this will have the basic education, will be the first priority then now the teacher education. So ……. so this must happen, is in the policy now, the Sessional paper has been taken to parliament for debate then after that we will be told go and do needs assessment and after that we will in the curriculum development process. And in the new structure, technology is given more emphasis from ECE level.

(CD01).....It is now or never! If I am asked the way you are asking me I would say right now, in fact it was supposed to have been started yesterday. Yaah! We are not going to wait anymore because we are not going to be, to allow ourselves to be overtaken by events. We are…. we are talking about eh …… For example we were being told tweeter and face book and whatever were introduced to all children in the world in less than two years. And now we were challenged, where are our Kenyan children going to be after ten years? Are we going to be behind the Chinese? Are we going to be, going to be behind the British? Because these things were introduced at the same time, tweeter, face book, name it! But even face book very few teachers know about it. So we are saying these things we are late, we are late

comers. So we cannot afford to wait. If anything government should do something, policies, good policies should be put place. We are very happy that ECE has been mainstreamed in, in education that it is going to be part and parcel of basic education and let us hope things will move the right way.

(CD02).....You know with the changing technology, it needs to be developed now. In fact it should have been developed yesterday, not now, yesterday and be implemented. Yaah!

(TP06).....Considering the ….. eh considering the current educational, social-economic and political contexts of Kenya, I am of the opinion that the integration of technology guideline should be adopted in the next five years.

7.5: Challenges in Informing Policy, Curriculum and Practice Related to the Integration Technology in ECE

Stakeholders were asked whether there were any challenges in inclusion of technology in Kenya's ECE policy, curriculum and practice. Data gathered on participants' responses are presented in Table 6.

Table 6:*Key Issues Informing Policy, Curriculum and Practice Related to the Integration of Technology in ECE*

	N=10	
Key issues raised by stakeholders	No of participants raising the issue	%
Lack of national and institutional policy frameworks on integration of technology in ECE programmes	9	90
Lack of curricula guidelines on integration of technology in ECE programmes	8	80
Lack of technology included practices in ECE programmes	7	70
Lack of knowledge and skills on use of technology in ECE programmes by educators	6	60
Lack of technology included professional training for ECE educators	6	60
Lack of government's support in regards to integration of technology in ECE programmes	9	90
Lack of resources (finances, electricity, technology equipment, training space, specialized manpower) to support integration of technology in ECE programmes	10	100
Lack of employment and motivation for ECE teachers	4	40
Lack of parents, communities and stakeholders' support	4	40
Illiteracy in technology and negative perception	5	50

(NP01).....Ah I think the most important thing is to consider the preschool teachers' background. I have realized that majority of teachers who train in these institutions come from very poor background. So we need to consider how to help these teachers acquire skills in ICT. My major concern is ICT training to be included in the syllabus to benefit the teachers…….. And preferably also to make sure that the trainers are also informed on ICT issue because we don't want to say we have the guideline and the trainers themselves do not have the basics of what to train in ECE as far as early childhood education is concerned.

(TP02).....I think the major concern in Kenya is infrastructure since you go to some places and find there is no electricity. I have seen a case in Rwanda where we have done it. Primary school children do not buy books but go to schools with laptops. And I think we have a lot to be done in Kenya.

(TP03).....Ok so for us maybe we can have a computer lab specifically now for the ECE department.

(TP04).....At our university there should be a deliberate policy that every member of staff becomes literate in computers. There should also be a deliberate policy that the changing IT environment is reflected in the training of teachers and by implications the training of learners given that the technological world is changing. And then it means that there must be deliberate effort to allocate

resources to target such initiatives, deliberate! It may not be very sweet. And then this should be spread over for that is the way it can spread. If the teachers know how to use it, the teachers have access to these things, the teachers have the technology, they have the skill then the implementation will be improved. But in the event that we have national policy we are only talking of the Konsa city as a technological centre without necessarily integrating technology from the start we will still hire experts from outside to come and do it for us. Microsoft.…… Microsoft has said they are going to come, the Google all these other guys want to come here. But why are they coming? They are coming because we take slightly longer to embrace changes. There is need for changes in governance, technology, instruction, and everything.

(TP05).....Of course the first thing is provision of resources …… we must think about seriously. The second issue is giving more support to teacher training at that level which they need support through in-servicing. Us we will do the orientation process after that KIE will do it obviously and they will also need more support later. At ECE level there will be need to sensitize and involve the local community, parents and other people within the community area to recognize the value of technology, even at home to support children in acquiring technology that is ECE level. Most of them are able to use the technology already even at the rural areas but you know in urban is not a problem because most parents are doing it. You buy a laptop in the house everybody is using it. ……. they have what we call mobile phones and these mobile phones nowadays are so ……. so they have these complex ones. And KIE is ….already develops a lot of ah.…… materials not just that using the textbooks, they also ……. eh ……. they use eh ……… involve technology in that like using, developing programs that can be used in learning if somebody has a computer and so on and this starts from the early stages.

(CD01).....We are talking about the, the social status of most of our families. So, we are not just going to assume that it's going to be embraced, capacity should be build, communities should be mobilised to embrace the issue. We are talking about infrastructure; we are not going to integrate the ICT at that level if there is no infrastructure. I am talking about electricity, I am talking about the classrooms; we should be talking about ah laboratories, computer laboratories in schools, we have to make sure that schools are well equipped in order for them to offer those services. If they are not then we shall be wasting time. Teachers also should be trained to handle the materials. If you bring computers in a school and the teachers can't operate on them the learners will, will just have a raw deal. And then we are also talking about ah sustainability, most the programmes collapse because of failure to sustain what has already been set. Structures should be set, put in place to ensure that the programmes long last or live long. We are not going to start programmes that will end as soon as we started. We are also talking about security, yeah, we start programmes, ICT programmes in schools, in areas that are insecure, it will still be to no avail yeah because the equipment will be vandalised, yeah.

(CD02).....First of all we have this issue of devolved government; we have the county government that has been introduced. And the county government as per now does not have structures, so that will be a big problem. These people have, they won't appreciate ECE at this level at the moment. The central government should continue to run the ECE matters until the structures for devolved government are put in place, that is the first thing. The second thing is to address the issue of ah infrastructure for training institutions, which area awfully inadequate. These training institutions need to have their own training ah infrastructure which they can use. And so long as we don't have that, the trainers will continue to have a big problem. Then the finance to buy eh, eh these, the equipment and what have you. That one is an issue and the government needs to set aside money for the same. But also, even that money they charge the students, some of it can be saved. If they have we have our own training centres, there is, money can be saved from fees and used in, in buying the equipment, perhaps those are the challenges.

(TP06).....Um...there need for adequacy of the computers so that they should be enough for all the students. Also we should have skilled manpower like trainers who will now implement the training, the, the programme. There should be deployment of the knowledgeable staff within the, within the, the ECE department.

8. Conclusions

Findings from this study indicate that stakeholders were of the view that inclusion of technology in ECE requires a national policy, curriculum guidelines, resources, professional training for teachers and sensitization and

awareness for parents and communities. The participating stakeholders (90%) felt there was need for a national policy to guide inclusion of technology in ECE programmes both at preschool (including special needs programmes) and teachers' training levels. All the participants (100%) were of the view that inclusion of technology in all ECE programmes both at preschool (including special needs programmes) and teachers' training levels required infrastructure including electricity, classrooms, ICT resources, funds and manpower. Few participants were of the view that inclusion of technology in ECE would require sensitization and awareness for parents and communities including educators on the importance of innovation and potential roles. Key issues identified were: Lack of government's support in regards to integration of technology in ECE programmes, absence of resources (finances, electricity, technology equipment, training space, specialized manpower) to support integration of technology in ECE programmes, Lack of employment and motivation for ECE teachers, Lack of parents, communities and stakeholders' support and Illiteracy in technology and negative perception.

9. Recommendations

- The government should come up with institutionalized policy/curriculum guidelines and resources as well as adequate timeframe for adoption of ICT in ECE programmes.
- Effective teacher training programmes and professional development should be considered as vital for supporting digitization of curriculum for preschool education.
- The ministry of education should provide infrastructure including electricity, classrooms, ICT resources, funds and manpower.
- Parents and the community should be sensitized on the Potential benefits of ICT at preschool level.
- The ICT recommendations, strategies and plans should be effected to strengthen relationships between parents and teachers, and forge strong connections in ECE settings, home and other learning environments.
- Key issues such as hindrances to service, delivery systems for all children, should be addressed through effective policy guidelines.
- Access to research evidence about workable policy frameworks to inclusion of ICT in ECE would offer a valuable resource for practitioners.

References

Ashbolt, A. (2009). A market model of education? Melbourne: Australian Education Union (AEU). Accessed December 18, 2009, from http://www.aeufederal.org.au/Publications/2009/AAshbolt2009.pdf .

Bernard, H. R., & Ryan, G. (2010). Qualitative data analysis: Systematic approaches. Thousand Oaks, CA: Sage.

Burnett, Cathy. (2010). Technology and literacy in early childhood educational settings: A review of research. Journal of Early Childhood Literacy, 10(3), 247-270. doi: 10.1177/1468798410372154

Cviko, A., McKenney, S., &Voogt, J. (2012).Teachers enacting a technology-rich curriculum for emergent literacy. Educational Technology Research and Development, 60(1), 31-54. doi: 10.1007/x11423-011-9208-3.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–339.

Downes, T., Arthur, L., & Beecher, B. (2001). Effective learning environments for young children using digital resources: An Australian perspective. Information Technology in Childhood Education Annual, 139-153.

Fereday, J., & Muir-Cochrane, E. (2006).Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. International Journal of Qualitative Methods, 5(1), Article xx.

Fesakis, Georgios, Sofroniou, Christina, &Mavroudi, Elisavet. (2011). Using the Internet for Communicative Learning Activities in Kindergarten: The Case of the "Shapes Planet". Early Childhood Education Journal, 38 (5), 385-392. doi: 10.1007/s10643-010-0422-0

Geoffrey, Grace, W., (2012). Factors affecting implementation of ICT integration in education: a case of secondary schools in Westlands district, Nairobi county, Kenya
URI: http://erepository.uonbi.ac.ke:8080/xmlui/handle/123456789/6722

Lin, M.-C., Wang, P.-Y.and Lin, I.-C., 2012. Pedagogy technology: A two-dimensional model for teachers' ICT integration, British Journal of Educational Technology, vol. 43, pp.97-108.

Lindahl, M. G., &Folkesson, A. (2012). ICT in preschool: Friend or foe? The significance of norms in a changing practice. International Journal of Early Years Education, 20(4), 422- 436. doi:10.1080/09669760.2012.743876.

Mauta P. K., & Margaret N. W., (2014). Integrating Information Communication Technology Skills in Preschool Education in Kenya. School of Education, Mount Kenya University ISSN 2039-2117 (online) ISSN 2039-9340 (print) Mediterranean Journal of Social Sciences MCSER Publishing, Rome-Italy Vol 5 No 5 pp:89-104.

Milimu,G.S.,OdundoP.A.,Ganira, K.L., and Mwanda.S.(2016). Selection of Developmentally Appropriate Technology in Early Childhood Education Environments, Serving Ages 4-6 in Nairobi County, Kenya. Donnish Journal of Educational Research and Reviews Vol 3(1) pp. 001-008.

Odundo Paul Amolloh1, GaniraKhavugwi Lilian and Milimu Gladys Shaji , (2017). Adopting Digital Technology in Teaching and Learning Environment in Early Childhood Education Classes in Nairobi County, Kenya. Asian Education Studies; Vol. 2, No. 3; 18-28. ISSN 2424-8487 E-ISSN 2424-9033.

Oyier, C.R., Odundo, A.P., Ganira, K.L., and Kahiga, R.W. (2015). Effects of Integration of ICT in Management of Private Secondary Schools in Nairobi County, Kenya: Policy Options and Practices. World Journal of Education, Vol.5, No 6: pp 14-22.

Patton, M. (1990).Qualitative evaluation and research methods (pp. 169-186). Beverly Hills, CA: Sage.

Phelps, R., Graham, A., & Watts, T., (2011).Acknowledging the Complexity and Diversity of Historical and Cultural ICT Proffesional Learning Practises in Schools. Asia-Pacific Journal of Teacher Educaton, 39 (1), pp. 47-63.

Plowman, L., (2011).Rethinking Young Children and Technology.Research Briefing One for Digital Childhoods, Scottish Universites Institute.

Plowman, L., Stevenson, O., McPake, J., Stephen, C., &Adey, C. (2011). Parents, pre-schoolers and learning with technology at home: Some implications for policy. Journal of Computer Assisted Learning, 27(4), 361-371. doi:10.1111/j.1365-2729.2011.00432.x

Republic of Kenya (2006a).Early Childhood Development Service Standard Guidelines For Kenya. Nairobi: Government Printer.

Republic of Kenya. 2008. Education Sector Report 2008: Realizing Vision 2030 Goals through Effective and Efficient Public Spending. Nairobi: Ministry of Education, Science and Technology, Government Press.

Republic of Kenya. 2012. Sessional paper No. 4 of 2012 on Reforming Education and Training. Nairobi: Ministry of Education, Science and Technology, Government Press.

Seidman, I., (2013). Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences.Teachers College Press.ISBN 0807754048, 9780807754047.

Smith, M., Davidson, J., Cameron, L. and Bondi, L. (2009) Emotion, place and culture. Ebrary[Online].Availableat:http://site.ebrary.com/lib/queensbelfast/docDetail.action?docID=10276597 (Accessed: 30th August 2012).

Stepehen, C., McPake, J., &Ploman, L., (2010). Digital Technologies at Home: The expriences of 3- and 4-year-olds in Scotland, in M. M. Clark & S. Tucker (eds.) Early Childhoods in a Changing World, (pp. 145-154). Stoke-on-Trent: Trentham Books.

Tonduer, J., Coppert, M., & Newhouse, C. P., (2010). From ICT Coordination to ICT Integration: A longitudinal case study. Journaoog Computer Assisted Learning, 26(4), pp. 296-306.