USING ICT FOR TEACHING AND LEARNING IN EARLY CHILDHOOD CARE EDUCATION (ECCE) IN THE 21ST CENTURY

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Abstract
The Information and Communications Technologies (ICTs) impact positively on the field of education in most developed countries. But, it is still relatively new in classroom lerning and instruction in developing countries. This review study is an attempt to explore the use of ICTs in early childhood care education (ECCE) in the 21st century. The population comprised of 50 teachers from fives ECCE schools in Zaria Local Government Area of Kaduna State. The instrument for data collection was structured questionnaire, and data collected were analysed. Findings showed that ICTs are potential powerful enabling tools for effective teaching and learning in early childhood education. However, if not properly used, they can cause harm to the young ones. ICTs can provide additional strategies to address major educational challenges being faced by teachers and children in (ECCE) in the 21st century. The study recommends appropriate use of ICTs to influence and change traditional methods of teaching and learning in early childhood care education, thereby, ensuring quality education.

Introduction

Information and Communications Technology (ICT), according to Ikoh and Nwankwo (2013), plays an important role in the teaching and learning in early childhood. It is a powerful means of communication and education. Due to its interactive nature, it has the potential to meet the needs of providing practical ways of constructively directing their own learning activities and complete tasks in a way to meet their own interests and need.

There is little doubt that use of ICT plays a significant role in the everyday lives of children in these current times. As Yelland (2006) notes, the very nature of our work and leisure time has been transformed, due to the present use of ICTs. It has pervaded homes and society at large and this influences many aspects of most children everyday lives. As a tool, ICT has the potential to transform the way that education is delivered (Fisher, 2001). ICT can facilitate differentiation and individualization in education: the use of ICT makes it possible to tailor both the content and the presentation of the subject matter to the individual background, experience and needs of children. In addition, as Schiller & Tillett (2004) said, ICT enhances what is possible by amplifying what teachers are able to do, by providing an entry point to content and enquiries that were not possible without the use of ICT, by extending what children are able to produce as a result of their investigations, and finally by providing teachers with the opportunity to become learners again.

The initial interest in the present use of ICTs in Early Childhood Education (ECE) stemmed from extensive teaching experiences in the early childhood sector, where it was evident that ICT was becoming an increasing fixture in the teaching and learning environment. More recently, this interest shifted into a slightly different direction when working with early childhood student teachers within the teacher education context. It became increasingly apparent that teachers and student teachers displayed varying views of the part they considered ICT

played or should play within these settings, coupled with how they chose to use or not to employ ICT resources.

Haugland (2000) argued that computers and ICT can be used in (developmentally) appropriate ways with very young children when they are ready to learn using it. The author recommended that computers be introduced to young children when they are about three years of age. ICT offers a multiplicity of uses and can be integrated into meaningful and learning opportunities for children, assist in administration and management of tasks. It has tremendous potentials to enhance early learning experiences, professional development, communicating with families and communities and administration in early childhood education services. Until fairly recently the bulk of literature in relation to ICT, was centered predominantly on the compulsory education sector. While ICT within the schooling sector has long been considered an integral component of the curriculum, the use of ICT within early childhood education had been afforded less attention.

This lack of attention did not necessarily mean however, that ICT was non-existent or not implemented within early childhood contexts. Several studies suggest that small groups of early childhood teachers have been implementing and integrating lCT within their teaching and learning contexts over a number of years. These innovative practices have contributed to increasing the profile of early childhood education both locally and internationally.

There are, however, significant challenges that are considered stand in the way of ICT deployment in early childhood education, such as equity of access to equipment, and professional development provision, e.g. in terms of training teachers. Understanding gap sexist as Dale, Robertson, and Short (2002) predict that the qualitative and quantitative gaps between the pupils' and the teacher's understanding of the affordances of ICT as a technology of teaching are much greater than has here-to-for been the case with any other teaching technology. Plowman and Stephen

(2005) argued that the curriculum and assessment are less prescriptive for pre-school settings and the use of computers in driving up standards is not yet explicitly stated in pre-school policy documents. They also asserted that pre-school practitioners have a diverse range of qualifications and experience and settings sometimes have very few staff; according to them, pre-school settings do not generally have a high level of ICT resources.

The Alliance for Childhood (2000) argues for the removal of computers in American schools, as they consider that the use of computers is dangerous for children's physical, emotional and intellectual development. On the other hand, Jones (2002) disputed these claims, as his research indicates that children were spending far more time watching television than working on computers.

The literature reviewed on research evidence on the ways in which ICT is used in pre-school settings points to the paucity of good evidence-based writing on the subject. There is a consensus among policy makers, practitioners, academics, and parents on the relationship between play and learning and, increasingly, on the benefits of introducing children to ICT at an early age but there is little evidence-based guidance available for its use in pre-school education.

The major objectives of this study was therefore to determine the extent to which ICT can be used in enhancing early childhood education. Specifically, the study sought to:

1. Determine the roles of the teachers in implementing and integrating ICT within the early childhood context.
2. Identify the ICT materials that are needed for effective teaching and learning in early childhood education.
3. Identify the roles of ICT in the teaching and learning environment in early childhood education.
4. Identify the challenges of ICT in early childhood education.

Methodology

This study is a descriptive survey that was carried out in five nursery schools in Zaria Local Government Area of Kaduna State. The study sought information from teachers of early childhood on the use of computers for teaching and learning in nursery schools. A total of fifty (50) teachers from five ECE schools in Zaria Local Government Area of Kaduna State were respondents.

Three care-givers selected from the five schools worked as research assistants, collecting data from the five different schools. The instrument used for data collection was a structured questionnaire. Three experts validated the instrument. Two experts in early childhood education and one from computer education. The questionnaire items were thirty-five (35) in number generated based on the five nursery schools and four research questions which guided the study. The questionnaire items were assigned a four (4) point rating scale of strongly Agree (SA) Agree (A) Disagree (D) and strongly disagree (SD) and these were 4,3,2 and 1 respectively. The acceptance point for the item was 2.50 and above, any mean score below 2.50 was considered not too influential and seen as negative. The data were coded and collated from the completed research instruments and were treated accordingly with their respective statistics.

Results

The results are presented in the order of the research questions.

Research Question One

Table 9.2.6.1: Mean ratings on the roles of the teachers in implementing and integrating ICT within early childhood education (ECE).

S/N	Item statement	SA	A	D	SD	Mean	Remark
1.	Teachers should develop their own ICT skills	35	15	-	-	3.70	Agree
2.	Teachers should support and guide the child to gain access to information and use ICT successfully.	10	40	-	-	3.20	Agree
3.	Teachers should allow children to explore ICT materials and teach them to respect the materials.	29	21	-	-	3.58	Agree
4.	Teachers should build expertise, learning alongside children, exploring and researching new ways of learning	30	20	-	-	3.60	Agree
5.	Teachers should be knowledgeable in computer and teaching skills	15	35	-	-	3.30	Agree

The data presented in Table 9.2.6.1 revealed that all the 5 items on the roles of the teachers in implementing and integrating ICT within the early childhood education have their mean scores ranging from 3.30 to 3.70 which indicated that the respondents agreed to items 1, 2, 3, 4, 5 as the roles of the teachers in implementing and integrating ICT within the early childhood context.

Research Question Two

Table 9.2.6.2: Mean ratings on the ICT materials needed for effective teaching and learning in early childhood education.

S/N	Item statement	SA	A	D	SD	Mean	Remark
6.	Touch screen: allows children to point at an alphabet by touching the screen.	28 22	-	-	-	3.56	Agree
7.	Digitizer: used to trace or copy drawing.	37	13	-	-	3.74	Agree
8.	Cell phone	36	14	-	-	3.72	Agree
9.	Video projectors	27	23	-	-	3.54	Agree
10.	Web cameras	31	19	-	-	3.62	Agree
11.	Digital cameras	39	11	-	-	3.78	Agree
12.	Video recorders, DVDs and CD recorders	29	21	-	-	3.58	Agree
13.	Electronic musical instrument e.g piano	34	16	-	-	3.68	Agree
14.	Image scanner	17	33	-	-	3.66	Agree
15.	Computer unit	29	21	-	-	3.58	Agree
16.	Electronic toys such as those that can produce rhymes and ringtones.	30	20	-	-	3.60	Agree
17.	Keyboard and mouse	38	12	-	-	3.76	Agree
18.	Display screen	35	15	-	-	3.70	Agree
19.	Joystick	32	18	-	-	3.64	Agree
20.	Audio speakers	26	24	-	-	3.52	Agree

The data represented in Table 9.2.6.2 reveal that all the 15 items on the ICT materials needed for effective teaching and learning in early childhood education have their mean scores ranging from 3.52 to 3.78 which indicates that most respondents agree that the ICT materials listed in items 1-15 are needed for effective teaching and learning in early childhood education

Research Question 3

Table 9.2.6.3: Mean ratings on importance of ICT in the teaching and learning environment in early childhood education

S/N	Item statement	SA	A	D	SD	Mean	Remark
21.	ICT is a very useful and valuable tool to use alongside everything else we do.	28	22	-	-	3.56	Agree
22.	ICT gives early childhood teachers and children arrange of tools to support and enhance learning	32	18	-	-	3.64	Agree
23.	ICT enhances documentation processes by allowing children document their own learning.	40	10	-	-	3.80	Agree
24.	ICT is an asset for children to acknowledge their learning and gain skills.	37	12	-	-	3.72	Agree
25.	ICT helps in strengthening and enhancing relationship with the teaching and learning community.	27	23	-	-	3.54	Agree
26.	Mastering the use of different ICT tools aids children's belief in their own competency.	32	18	-	-	3.64	Agree
27.	ICT use supports effective learning for children	33	17	-	-	3.66	Agree
28.	ICT allows children monitor and reflect on their own learning.	38	12	-	-	3.76	Agree
29.	ICT enables children to actively work together	37	13	-	-	3.74	Agree
30.	ICT is suitable for delivery of learning in all situations	31	19	-	-	3.62	Agree
		31	19	-	-	3.62	Agree

The data represented in Table 9.2.6.3 reveal that all the 10 items on the importance of ICT in the teaching and learning environment in Early Childhood Education have their mean scores ranging from 3.54 to 3.80 which indicates that most respondents agree that ICT is important in the teaching and learning environment in Early Childhood Education (ECE).

Research Question 4

Table 9.2.6.4: Mean ratings on the challenges of ICT in early childhood context

S/N	Item statement	SA	A	D	SD	Mean	Remark
31.	Implementation of ICT can be difficult to maintain.	32	18	-	-	3.64	Agree
32.	Lack of fund to procure the needed ICT materials.	33	17	-	-	3.66	Agree
33.	Lack of infrastructure like power supply and other technology tools.	30	20	-	-	3.60	Agree
34.	Lack of ICT skills on the part of teachers	24	26	-	-	3.52	Agree
35.	Teacher's resistance to the adoption of new Technology	39	12	-	-	3.20	Agree

The data represented in Table 9.2.6.4 also revealed that all the 5 items on the challenges of ICT in the early childhood context have their mean score ranging from 3.20 to 3.66 which indicates that most respondent agree to all the items as challenges of using ICT in the early childhood context.

Discussion of Results

Based on the analyses of the data, certain findings were made, which are now discussed. Research question one deals with the roles of the teachers in implementing and integrating ICT within early childhood education. The data given in Table 9.2.6.1 shows roles of the teachers in implementing and integrating ICT within the early childhood education and are as follows; The teachers should develop their own ICT skills. The teachers should support and guide the children to gain access to information and use ICT successfully; Teachers should allow children to explore ICT materials and teach them to respect the materials; teachers should build expertise, learning alongside children, exploring and researching new ways of learning; the teachers should be knowledgeable in computer and teaching skills. The teachers perceived their roles in relation to ICT no differently than their overall teaching roles within the

"early childhood" context. They saw themselves as supporting and guiding children's learning through the provision of a purposeful and innovative teaching and learning. Ward et al (2005) argued "to increase such use of ICT requires a better understanding of how teachers construct their practice and the place of ICT in that practice. The listed statements were agreed upon by the respondents as the roles of the teachers in implementing and integrating ICT within the early childhood context.

Research question 2 deals with the ICT materials needed for effective teaching and learning in early childhood education. The data in Table 2 shows the ICT materials needed for teaching and learning in early childhood education which are as follows; Touch screen: allows children to point at an alphabet by touching the 'screen, Digitizer: used to trace or copy drawing, Cell phone, Video projectors, Web cameras, Digital cameras, Video recorders, DVDs, and CD recorders, Electronic musical instrument e.g. piano, Image scanner, Computer unit, Electronic toys such as those that can produce rhymes and ringtones, Keyboard and mouse, Display screen, Joystick, Audio speakers are now predominantly being used as a way of enhancing and making visible young children's learning, rather than as disparate pieces of technical equipment for children to learn about (Erb, 2008; Ramsey, et al., 2006; Tringham, 2006). It appears therefore, that the use of ICT has now significantly broadened, with computers being seen as only one of many tools (Colbert, 2006; Hong & Trepanie" - Street, 2004; Federal Ministry of Education, 2009).

The finding of the study in Table 3 shows that the respondents agreed that ICT is a very useful and valuable tool to use alongside everything else we do, 1CT gives early childhood teachers and children a range of tools to support and enhance learning, ICT enhances documentation processes by allowing children document their own learning. ICT is an asset for children to acknowledge their learning and gain skills; ICT helps in strengthening and enhancing relationship with the teaching and learning community.

The teachers in this study expressed an overall positive picture of the roles ICT could play in Early Childhood Education, amid a climate of continuing controversy about the degree to which ICT is appropriate for young children to engage with (Siraj-Blatchford &White bread, 2003). Nevertheless, these teachers were quite clear about the place ICT could hold within the early childhood environment. As Siraj-Blatchford and White bread (2003) states if children are to understand ICT they need to see it used in a meaningful context, and for real purposes.

The Table also shows that Mastering the use of different ICT tools aids children's belief in their own competency (Fisher, 2001). ICT allows children monitor and reflect on their own learning, enables children to actively work together, and is suitable for delivery of learning in all situations. The teachers in this study considered that ICT created increased opportunities for children, their families and teachers to interact more deeply through different digital media. The oral, visual and written nature of these interactions invited diverse, pathways for the community to participate and engage with the early childhood centre (Boardman, 2007; Hong & Trepanier Street, 2004). The development of children's portfolios, containing a raft of documentation, was seen to contribute towards cementing and strengthening relationships (Hatherly, 2006).

The findings of the study in Table 9.2.6.4 show that implementation of ICT can be difficult to maintain, there is lack of fund to procure the needed ICT materials, there is lack of infrastructure like power supply and other technology tools, lack of ICT skills on the part of the teachers, Teachers resistance to the adoption of new technology. However, that due to the commitment and enthusiasm demonstrated by these teachers, these challenges did not appear insurmountable. Nevertheless, the challenge remains for teachers to navigate their way through the array of software programmes and resources to ensure a holistic, yet critical; approach is infused when utilizing ICT materials within the early childhood setting.

Conclusion

The findings from this study identified many benefits of using ICT by teacher's for enhancing inspiring pupils and increasing the provisional satisfaction. The teachers involved in this study considered that ICT in ECE offered valuable opportunities to make children's learning visible and contributed to developing and enhancing relationships with children, families and teachers when integrated in meaningful and purposeful ways within the early childhood teaching and learning community.

It is important that teacher's beliefs, roles and experiences are considered, if changes are to be made to foster and optimize opportunities for young children's learning, and how these beliefs, roles and experiences influence and shape the ways in which teachers implement and integrate ICT within the early childhood context.

Recommendation

The following recommendations were made, based on the findings of the study

1. Researchers and educators should encourage ICT in ECE from the perspectives of children and families. This will help in exploring how early childhood teachers notice, recognize and respond to the impact of ICT on young children, through a series of case studies.
2. Further researchers should examine early childhood teacher education to incorporate adequate ICT content.
3. Government should give teachers opportunities to actively engage in dialogue to explore and articulate their pedagogical approach, to ICT in ECE.
4. Teachers should help to create opportunities for young children to understand and appreciate the benefits of visual images and graphics in knowledge which are part of their everyday experiences.
5. The teachers should be involved in decision making surrounding the purchasing, implementing and application of ICT and sometimes

improvise when necessary rather than being randomly supplied with resources to use.

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