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## **Student Teachers' Perceptions on the Use of ICT as a Tool for Teaching and Learning at Early Childhood Development Level: A Case for Women's University in Africa**

**P.Kashora**

Lecturer, Women's University in Africa, Zimbabwe

**E.Chikwiri**

Lecturer, Women's University in Africa, Zimbabwe

**C.Kuranga**

Lecturer, Women's University in Africa, Zimbabwe

### **Abstract:**

*The purpose of this study was to find out the teachers' perceptions on the use of Information Communication Technologies (ICTs) as a tool for teaching and learning at Early Childhood Development (ECD) level. A sample of 12 female in-service student teachers from the Women's University in Africa was used. The study utilised both qualitative and quantitative methods. Quantitative data was collected through the use of a questionnaire while qualitative data was gathered through Focus Group Discussions with 12 in-service student teachers to gather in-depth information on the use of ICTs as a tool for ECD teaching and learning. The research findings revealed that the student teachers concurred that ICTs are indeed an emerging tool in enhancing the quality of teaching and learning. Student teachers revealed that they perceive ICTs to be good since they promote child-centered learning. ICT motivates children to learn using multi-sensory displays that accommodate their individual differences. The findings also revealed that ICTs assist in the simulation of the outside world in a way that saves time and resources. However, lack of resources and lack of ICT knowledge by the authorities in the schools were cited as major barriers to the integration of ICTs in the ECD curriculum. The study concluded by recommending that professional development workshops should be held from time to time so as to improve practice. A variety of ICT gadgets should be provided in schools. Policy provisions which promote the use of ICTs should be put in place by the Ministry of Primary and Secondary Education. Personnel should be allocated to assist in the public use of ICT tools and materials.*

**Keywords:** *Information and Communication Technology, Early Childhood Development, Perceptions, Teaching and Learning*

### **1. Introduction**

Information and Communication Technology (ICTs) includes computers, the internet and electronic delivery systems such as radio, television and projectors among others. It is widely used in today's education field. Kent and Facer (2004) indicated that the school is an important environment in which students participate in a wide range of computer activities, while the home serves as a complementary site for regular engagement in a narrower set of computers.

Studies have established that ICTs enhance the learning process for ECD children through the exercising of various senses that assist retention. Therefore, an effective ICT professional development for ECD practitioners is imperative to develop thorough ICT understanding, which will motivate practitioners to interrogate and analyse the way they deliver lessons. Therefore, if ICTs are effectively integrated into the ECD curriculum, teaching and learning may improve tremendously.

### **2. Review of Related Literature**

Although considerable qualitative and quantitative data have indicated that technology has a significant impact on ICT literacy development, other studies conducted on ICT and ECD evidently indicate that findings are not conclusive on the impact of ICT on teaching and learning. From his findings Higgins (2003) revealed that ICTs can facilitate effective teaching and learning but Peck (2002) and Reynolds (2002) on the contrary revealed that ICT has done very little to transform or improve in any meaningful way teaching practice or children's learning experience. Therefore, the availability of ICTs equipment may not necessarily make a difference but the way the equipment and resources are used or the way ICTs are

integrated into the curriculum designed. Those who argue in favor of positive benefits point out that ICT can contribute or transform the relationships, roles and activities experienced by learners and practitioners in ECD settings. In addition, the learner can use ICTs in their play as individuals, with colleagues, or with adults. Furthermore, ICTs provide unique opportunities for scaffolding and supporting learning, including language and mathematical development. Last but not least, ICT can be used by practitioners to document and reflect on the learners' learning.

### *2.1. Teacher's Characteristics*

The characteristics of a teacher may be classified as general or ICT related. General characteristics include innovativeness and teacher self-efficacy while ICT-related characteristics include ICT competences. Innovativeness indicates the willingness of an individual to change his/her familiar practices. In addition, innovativeness tends to influence the use of ICT in the classroom (Van Braak, 2001).

Teacher self-efficacy can be defined as the teacher's capability judgment especially on learners who may not be motivated (Tschannen-Moran, 2001). Teacher self-efficacy is linked to teachers' ICT competences, the attitudes towards ICTs and the use of ICTs (Sang, 2008).

The teachers' self-perceived ICT competences are the reflection of beliefs about his/her proficiencies in the use of ICT in which incompetence is a major barrier to ICTs integration (Compeau, 1999). There are three types of skills and knowledge that are crucial to the integration of ICTs in the classroom which are: specific technology knowledge and skills, knowledge of technology related-classroom management and technology-supported-pedagogical knowledge (Hew, 2007).

ICT professional development stands as an essential approach that nurtures ICT integration into classroom practice (Vanderlinde, 2010). A number of approaches exist to facilitate ICT professional development which includes the investment in infrastructure and equipment, the dissemination of good practice, and training programmes tailored to promote skill levels and nurture positive attitudes among teachers towards ICTs (Galanouli, 2004).

## **3. Methodology**

The researchers employed both quantitative and qualitative methods. Qualitative data was collected through Focus Group Discussions with in-service student teachers to gather in-depth information, views and perceptions on the efficacy of ICTs as a tool for teaching and learning. Quantitative data was collected through the use of a questionnaire to generate statistical data on the following: barriers to the use of ICTs as a tool for teaching and learning, how barriers can be overcome, benefits of using ICTs and availability of ICT facilities in ECD centres. A sample of 12 in-service student teachers was selected purposively. The twelve student teachers were enrolled in the Communication and IT module during the second semester in 2017. Before enrolling in Communication and IT module, students undertook the Introduction to Technology module. The aim of the Communication and IT module was to expose the students to best practices of ICT at ECD level and to broaden their understanding of ICTs associated with their existing ECD pedagogical views and philosophy. Data were analysed using NVivo data analysis package. The study sought to answer the following research questions:

- What is the student's teachers' understanding of ICTs?
- Which barriers do student teachers experience in the use of ICTs as a tool for teaching and learning?
- How can the barriers be overcome?
- Do schools have adequate ICT facilities?
- What recommendations based on the findings can be proposed to improve current practice?

## **4 Results and Discussion**

### *4.1. Demographics*

Interviews were done with 12 in-service teachers, all with a diploma in ECD teaching. Their experience in teaching ranged from 4-17 years (40%) with most of them (60%) in the lower range of 4-5 years. The effect of inexperience can be a significant obstacle to the integration of ICT in the classroom. A teacher who has had more teaching experience is more effective because he/she has perfected teaching methods with a variety of children over a long period of time.

### *4.2. Understanding of ICTs*

The student teachers' understanding of ICTs was largely based on the use of technological equipment such as computers, television and radios, internet, laptops, mobile phone and printers. It was construed as the relay of information and messages from one point to the next through technology as illustrated in Figure 1.

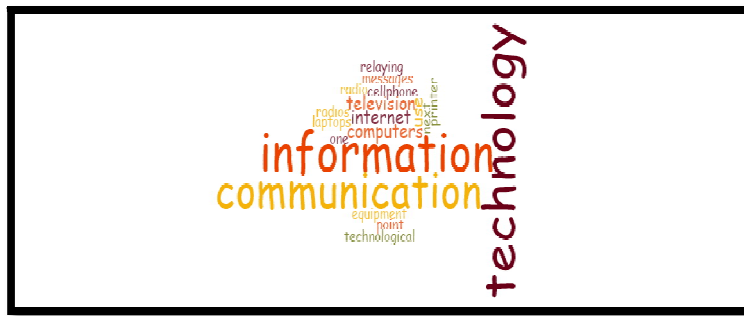


Figure 1: The Student Teachers' Understanding of ICTs

To summarise, the variety of responses indicated that participants viewed ICTs as a multi-faceted concept. Through ICTs learners are motivated and stimulated to learn using multi-sensory displays, those who cannot see can be taught using sound and those who cannot hear can be taught using sight. Hence the use of a multi-sensory perspective helps those children with hearing and visual difficulties. Teachers in the Focus Group Discussion revealed that they perceive ICTs to be an effective tool since they are child-centered. They revealed that ICTs make learning and teaching easier and make the learner easily grasp the concepts. The variety of responses indicates that participants understand what constitutes ICTs.

#### 4.3. Benefits of ICTs in Teaching and Learning

Most (9 out of the 12) of the respondents reported using ICTs as a way of enhancing teaching and learning. Participants indicated that the use of ICTs challenges pupils' understanding and thinking. This means that ICTs are seen as important tools which enable and support the move from traditional 'teacher-centric' teaching styles to more 'learner-centric' methods as indicated in Table 1. This limits the role of the teacher to supporting, advising and coaching children rather than merely transmitting knowledge. It is important to note that ICTs promote the understanding and discussion of difficult concepts. They mostly use it for teaching rhymes and games as well as storytelling.

The benefits for using ICTs as a tool for teaching were mostly on the improvement on proficiency and quality of teaching. However, practitioners need to rethink pedagogy, learning new skills in technology to drive educational change; planning for the introduction and use of ICT by children grounded in clear understanding of the purpose, practices and social context of ECD (Hara, 2004). Participants highlighted that for the learners, the benefits were reportedly to be more on raising morale and interest in learning.

The student teachers also confirmed that ICTs easily capture the children's attention and they will become eager to learn. They will be enjoying and it will be easier for them to understand concepts. It was also revealed that ICTs give room for the children to learn on their own, and the teacher would just become a mere facilitator. The respondents revealed that they are finding pleasure in using their recently acquired skills in their lessons. They perceived ICT as a tool for improving practice. Respondents pointed out that when using ICTs learning becomes less abstract and more relevant to children's real life situations in contrast to memorization-based or rote-learning, which are the features of traditional pedagogy. ICTs enhanced learning promotes increased learner engagement. In addition, ICTs –supported learning encourage interaction and cooperation among learners and teachers. It promotes the manipulation of existing information and creation of real-world products rather than the duplication of received information. Use of ICTs in the classroom is essential for providing opportunities for children to operate in an information age.

Do You Use ICT As A Tool For Enhancing Teaching And Learning?		Frequency	Valid Percent	Cumulative Percent
Yes	Communicating, managing, disseminating, creating and storing information	1	11.1	11.1
	Presenting lessons on PowerPoint	1	11.1	22.2
	Reinforce the lesson for example through a DVD in my heritage studies class	1	11.1	33.3
	research on children's work, children watch videos on laptops	1	11.1	44.4
	Storytelling through videos	2	22.2	66.7
	Teaching maths and stories	1	11.1	77.8
	Teaching rhymes and games	2	22.2	100.0
	Total	9	100.0	
No		3	100.0	100.0

Table 1: Benefits of ICTs in Teaching and Learning

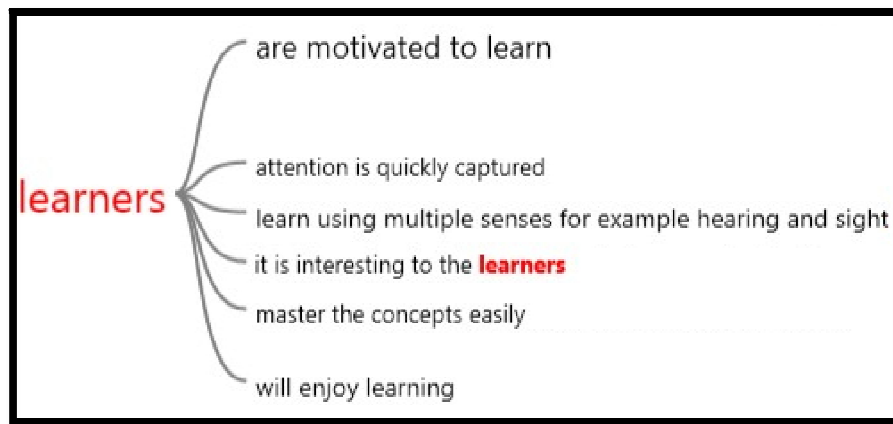


Figure 2: Benefits for the Use of ICTs to Learners

Participants also highlighted that the use of computers helps children to become knowledgeable, reduce the amount of direct instruction to them and thus gives the teacher an opportunity to help those children with particular needs. Use of computers contributes to a more constructivist learning, an increase in activity and greater responsibility for learners. ICT-enhanced learning promotes active learning in that it increases learner engagement.

#### 4.4. Barriers to Use of ICTs as a Tool for Learning

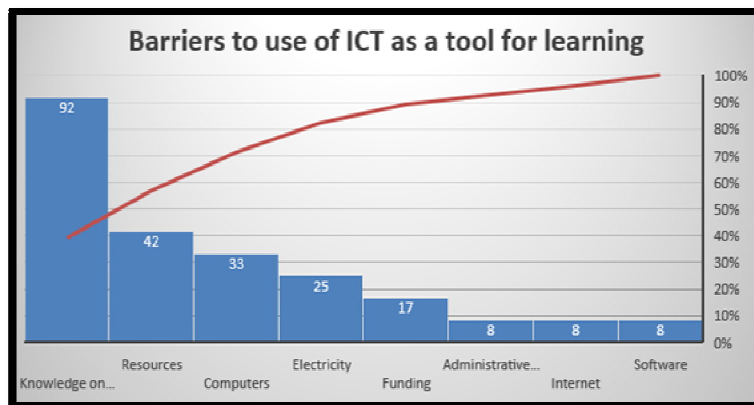


Figure 3: Barriers to the Use of ICTs as a Tool for Learning

The teachers largely highlighted lack of knowledge in the use of ICT gadgets as a barrier to effective ICT use. Although teachers' attitude towards the use of technologies is vital, observations of this study indicated that some student teachers are not clear on how far technology can be beneficial for the facilitation and enhancement of learning. Student teachers may have positive attitudes towards ICTs but refrain from using it in teaching due to low self-efficacy, tendency to consider themselves not adequately qualified to teach using technology. Bandura (1986) describes self-efficacy as the "individual's opinion of capabilities to organize and perform courses of action to achieve particular types of performances". Brosman (2001) says attitude, motivation, computer anxiety and computer self-efficacy is factors affecting teachers' use of computers in their lessons. Student teachers also cited lack of confidence as preventing them from using ICTs effectively. They see it as a contextual factor which acts as a barrier. Lack of confidence is brought about by fear of failure.

Respondents also cited student teachers' lack of enthusiasm to use ICTs in education as one of the barriers in the use of ICTs. Student teachers' attitude and an inherent resistance to change was also cited as a significant barrier. One key area of teachers' attitudes towards the use of technologies is their misunderstanding of how ICTs benefit their teaching and children's learning. Teachers who use ICTs regularly are likely to be confident and have a positive attitude towards it, hence perceiving ICTs as a useful tool.

Balanskaat (2006) found that limitations in teachers' ICTs knowledge makes them feel anxious about using ICTs in the classroom and thus not confident to use it in their teaching. Many teachers who do not consider they to be well skilled in using ICTs feel anxious about using it in front of a class of children who perhaps know more than they do. Lack of confidence and experience with technology influences teachers' motivation to use ICTs in the classroom.

As shown in Figure 3, resources and computers among others were also significantly cited by participants as other barriers. Some rural schools do not have electricity making the use of ICTs difficult. In other words, access to ICTs varies between

centres. The study found that, in general, centres in urban areas seem to be better equipped and resourced than those in rural areas.

High costs of technology and spare parts, as well as maintenance of facilities are prohibitive. Respondents highlighted that inadequate infrastructure is a fundamental problem for most ECD centres to deal with and might take a long time and huge funding to improve. Some participants indicated that in rural areas, ECD centres' financial resources are spent mostly on basic supplies such as food, medicines and water. In a sense, investing in ICTs for schooling might be regarded as a long-term issue. In such a scenario adopting ICTs in ECD centres is relatively not an urgent issue considering the serious poverty in the areas.

Participants also cited inadequate technical support as a barrier. Without good technical support in the classroom, teachers cannot be expected to overcome the barriers preventing them from using ICTs. Technical barriers cited by teachers included: waiting for websites to open, failing to connect the internet, printers not printing, malfunctioning computers and teachers having to work on old computers. Lack of digital literacy, pedagogical and didactic training in ICT use in the classroom were cited by respondents as obstacles. Inadequate or inappropriate training leads to teachers being neither sufficiently prepared nor sufficiently confident to carry out full integration of ICTs in the classroom.

4.5. Overcoming Barriers to the Use of ICTs

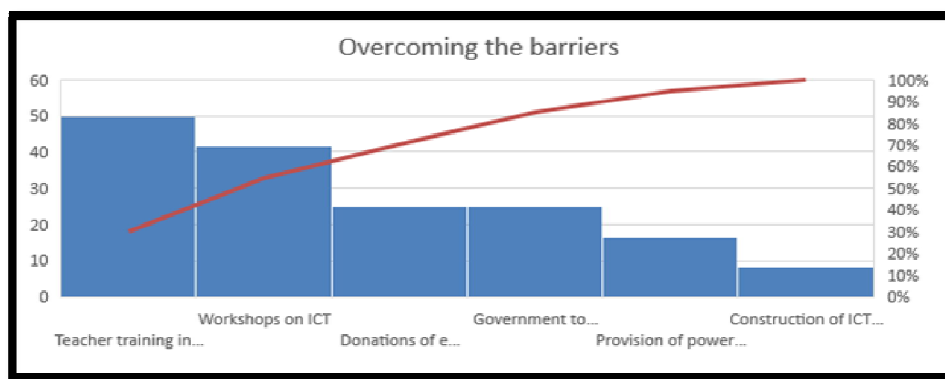


Figure 4: Ways to Overcome Barriers to the Use of ICTs

Student teachers cited training workshops as important in overcoming barriers. Even the most experienced teachers need to continuously upgrade their skills and keep abreast with current trends in ICT. Hence professional development becomes a key factor in educational ICT use. Respondents also highlighted the provision of adequate ICT facilities as a cornerstone in ICT use. Participants cited adequate maintenance of gadgets as well as availability technical support as critical factors in overcoming barriers.

4.6. Availability of ICT Facilities in Schools

Most (7 out of the 12) of the respondents reported that their schools do not have adequate ICT facilities. Lack of facilities has an adverse effect on the performance of children. Facilities enable the teachers to accomplish tasks well and help the learner to learn effectively.

Are ICT Facilities Available at Your School?		Frequency	Percent
Yes	Computers	2	40.0
	Computers and ICT resource person	1	20.0
	Computers and television	1	20.0
	Computers, WiFi and printers	1	20.0
	Total	5	100.0
No		7	100.0

Table 4: Available ICT Facilities

Respondents pointed out that provision of adequate facilities raises the morale and motivation of children and plays a significant role in improving the quality of education.

5. Conclusion

The study can conclude that student teachers have an understanding of what constitutes ICTs. The study also concluded that use of ICTs in the teaching and learning of ECD children has numerous benefits which include supporting the move from teacher-centric to learner-centric methods among others. It emerged that student teachers' inexperience is a

significant obstacle to the integration of ICTs in the classroom. Although teachers may have positive attitudes to ICTs they are inhibited from effective use due to low efficacy that can be overcome by capacity building. Lack of facilities at ECD centres also hampers effective integration of ICTs into teaching and learning.

## 6. Recommendations for The Improvement

Staff development workshops from experts in ICT should be undertaken. The workshops should focus on methods of integrating ICTs into teaching and learning at ECD level. ICT gadgets should be made available in schools so that teachers get cultured into their use. Teachers need to be given time to implement new technologies in the classroom. The Ministry of Primary and Secondary Education should put in place policy provisions that promote the use of ICTs schools. Specific units and personnel should be allocated for peer support and organization, as well as to assist in the public use of ICT tools and materials for ICT-enhanced instruction.

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