

Quest for the Adoption of Information Communication Technologies in ECD Settings in Hurungwe Central Schools

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Abstract

This study sought to fathom on the quest for the adoption of Information Communication Technologies (ICT) in Early Childhood Development (ECD) settings in the Central Circuit of Hurungwe District. Adopting and embracing the use of ICTs in the education fraternity at ECD level is critically important in laying a strong base for sustainable education. Due to globalisation, the use of ICTs has become more prevalent in all facets of human life. Effectively adopting ICTs in ECD settings supports noble strides towards sustainability in education by fomenting ECD learners in their learning and development of cognitive abilities, enhancing individuals' capacity to critical thinking and engaging them in innovative skills. Interpretivist philosophy and qualitative research approach were adopted in this study for their flexibility, which gave the researchers room to critically analyse the phenomenon under study in social context. A phenomenological design was adopted to collect data from six primary schools which were purposively sampled in Hurungwe Central Circuit to generate data for answering the research questions. Questionnaires, interviews and observations were used as instruments for data collection. Thematic approach was employed during data presentation, where emerging themes were analysed in relation to the problem at hand. The study found out that the adoption of ICTs was still at the infancy stage in the circuit investigated, with ECD learners being the least benefiting group from the available ICT resources due to a number of factors. The study therefore recommends multi-stakeholder collaboration where unified efforts are made towards availing proper physical infrastructural facilities and strong network systems to facilitate proper adoption of ICTs in ECD settings. The government and school administrators are urged to have positive mindsets and budget for ICTs especially for the ECD department which is usually deprived of benefits which are enjoyed by other departments in schools.

KEY WORDS: Adoption, ICTs, ECD, Sustainable Education and Globalisation

1. Background to the study

The adoption of Information Communication Technologies at ECD level is reckoned to be pivotal in ensuring sustainability in education. In the global spectrum, a number of countries adopted the use of ICTs in the education sector from ECD level up to institutions of higher learning. Yorke, Rose, Woldehanna, and Hagos (2021) indicate that most schools in Europe have adopted ICTs in their education from ECD level and their curricula are ICT driven. In this regard, Europe as a continent continues to make strenuous

efforts to reaffirm transformations to attain inclusive sustainable education and lifelong learning towards vision 2030. Globally, ICTs are believed to be enablers for innovative, creative, sustainable and lifelong learning which transform human lives almost in all facets.

For developing continents like Africa, South America and Asia, a number of countries are facing challenges in adopting ICTs in educational institutions (IMF, 2021). Africa is considered to be the poorest continent in the world making the adoption of ICTs in education a flop. Singleton (2018) echoes that the adoption of ICTs in a number of African countries face myriad instigations which include resistance to accept change, rapid technological changes, limited bargaining power to access ICT infrastructural facilities and high cost of internet access and ICT equipment. Since most countries in Africa are still developing, priority of availing ICTs in education especially at ECD is likely to be at risk due to lack of prioritisation. Robust evidence available shows that in a number of African countries, learners struggle to use ICTs during the teaching and learning process in schools due to various reasons.

Most African countries lack the expertise in using ICTs and do not have enough resources which affect the use and effective adoption of ICTs in education. In addition, the use of ICT resources in the education sector especially at primary school level is not fully recognised especially in ECD settings. Effectively adopting and embracing ICTs in education has the potential for preparing ECD learners for life skills in this 21st century. Gee (2011) indicates that by acquiring ICT skills, learners are ready to face real life problems contextually, understand them and contrivance competent counter-measures to curb such challenges as mitigation strategies to save humanity in their entirety and the future generations to come. Singleton (2018) airs that a number of schools in Zimbabwe have limited ICT devices and access to the internet which act as major instigations for the proper adoption of ICTs in education. If ICT devices and supporting infrastructural facilities are not available in schools as argues by Singleton, there is no way learners can utilise such facilities in their learning process. The adoption of ICTs and effectively embracing them is critically important at ECD level. The impact of ICTs in education in ECD settings cannot be underestimated if schools are to ensure sustainability in education in the current world of affairs. It means that proper adoption of ICTs in education avails a broader range of educational activities to meet diverse needs of ECD learners, proffer adaptive technologies and forms the baseline for the utilisation of online learning platforms.

The adoption and use of ICTs at ECD level is a transformative move in education which unleashes the scourge of rote learning and opens avenues for sustainability in education. UNESCO (2022) concurs that ICTs are enablers for long-life learning where people of all ages can utilise them to learn anything, anytime and anywhere as they wish to do. This shows that Information Communication Technologies can facilitate a broader range of educational activities to meet the needs of ECD learners from diverse backgrounds, support adaptive technologies and are a leeway to internet access which all are critical for inclusive growth and sustainable education. For this reason, all education sectors across the globe need to rethink and harness ICTs in ECD settings as the gist to achieve inclusive, broader and sustainable educational objectives at a larger spectrum.

Adam and Tatnall (2021) posit that ICTs enable blended learning and guarantee quality assurance of educational outcomes. This entails that the adoption of ICTs paves a way for word processing, communication, research, and multimedia projects which can help millions of ECD learners with specific learning and emotional disorders to catch up with their peers with ease and at their own pace. UNESCO (2022) concurs that technocrats in ICTs have also enhanced the development of sophisticated devices which can assist millions of learners with learning disorders in overcoming a wide range of limitations

that hinder their classroom participation. Robust evidence available indicates that utilising ICTs in ECD settings can eliminate learning disorders among learners, thereby allowing them to complete writing their work, offering them tutorials and drill-and-practice work which give room for better understanding.

ICTs provide multisensory experiences, interaction, positive reinforcement, individualised instruction, and repetitions which are useful in skill building at ECD level. Qingdao Declaration (2015) argues that ICTs have potential for: long-life learning pathways, access to inclusive education, online innovations, quality assurance, recognition of online learning and proffer solutions to a number of educational problems. The adoption of ICTs has become more prevalent and crucial than ever before considering the dominance of online learning which was triggered by the Covid-19 pandemic. Online learning was adopted as new normal pathways in education from the Covid-19 lockdown era by a number of countries globally and continued to exist from then. This made the adoption of ICTs in ECD settings a necessity, which needs urgent prioritisation in schools around Zimbabwe.

Despite all the noted benefits for adopting ICTs in ECD settings, a number of scourges which have tremendous effects in embracing them in primary schools in Zimbabwe are evident. Williams (2022) allude that a number of teachers are not adequately trained on how to effectively utilise ICTs in classrooms and the high cost of the ICT resources are major instigations faced by schools. This means that although ICTs have the potential to act as equalizers to level the learning field for diverse ECD learners in schools, its adoption is inflicted by a number of immeasurable stumbling blocks which continuously derail such initiatives. To achieve sustainability in education, scourges associated with the adoption of ICTs in ECD settings need to be rectified.

Having all this information at their exposure, the researchers felt that there is an education gap that has to be addressed. The need to fathom on the quest for the adoption of Information Communication Technologies (ICTs) at ECD level in Hurungwe Central Schools was triggered by this education gap in a bid to proffer strategies to ensure sustainability in education.

Statement of the problem.

There is need for schools to adopt the use of ICTs at ECD level to empower learners with twenty first century skills at a tender age. However, most of the schools in Africa are not yet fully developed and prepared to fully adopt and embrace ICTs as new pathways for teaching and learning. From the background literature unearthed, the researchers felt that ECD settings in the Central Circuit of Hurungwe District in Mashonaland West Province might be experiencing challenges in adopting and utilising ICT resources in the teaching and learning process. It is against this background that the researchers sought to explore on the quest for the adoption of Information Communication Technologies in ECD settings in Hurungwe Central Circuit Primary Schools.

Main research question

- Why the adoption of ICTs in ECD settings is critically important in education?

Sub-Research Questions

1. How are schools embracing the use of ICTs in ECD settings?
2. Which scourges are derailing the adoption and use of ICTs at ECD level in schools?
3. What strategies can be employed to ensure effective adoption of ICTs in ECD settings?

2. Theoretical framework

The Sociocultural theory by Vygotsky and the Technology Acceptance Model by Davis were merged to form the crux under which this study was built upon. Merging these two theories was envisaged by the

researchers to be strategic in laying the foundation for the adoption and effective use of ICTs in ECD settings while adhering to conspicuous uniqueness of individual schools. Drawing from literature available for the developed countries, vivid evidence bemist that the Sociocultural theory and the Technology Acceptance Model both factor in environmental context under which learning takes place, thereby making them applicable to this study. There are overwhelming facts indicating that the adoption of ICTs, encompassing environmental and sociocultural contexts enhances the learning and achievement of pupils.

Sociocultural learning theory

The sociocultural theory indicates that human learning is a social process and the origination of human intelligence is rooted in culture and the society. Vygotsky (1978) pinpoints that social interaction is the fulcrum for the development of cognition in learners. The theory alludes that everyday living experiences are presumed to be central for sustainable learning. The researchers therefore argue that the adoption and utilisation of ICTs in ECD settings in the teaching and learning process should be culturally and socially situated. The principles of Vygotsky's sociocultural theory which were seen to be key in this study are social interaction, culture, language, Zone of Proximal Development (ZPD) and scaffolding.

Social interaction

Social interaction is central for any learning to take place. Gee (2011) seconds that dynamic social interaction among humans is indispensable because of its core value to socially transform the minds of the learners for the better. For the adoption of ICTs to be viable, it is the society which should facilitate social interactions and mediate change of behaviour among ECD learners. Vygotsky believes that, for everything that is learnt, the learning process is encapsulated in two learning phases, that is firstly through interacting with others and secondly the individual integrates in his / her mental structure what was learnt from others.

Culture and language

Culture encompasses all customs, traditions, beliefs, values, behaviours, habits, language, food, clothing, norms, values and knowledge that characterise or define the total way of life of a people. Haralambos and Holborn (2008) argue that knowledge is passed from one generation to the other in cultural context, with language being the central tool for knowledge sharing. Language is part of human culture and all the teaching and learning is done within a specific culture through the use of language. For sustainable education, communities need to accept the use of ICTs as part of their culture for knowledge descendance and as communication tools.

Vygotsky (1978) believes that every function in the cultural development of children appears twice: first at social level, and later at individual level. The first phase happens between people as they interact using language (inter-psychological) and then secondly within the individual child (intra-psychological). For this reason, the whole community should embrace the use of ICTs as part of their culture and language tools if sustainability in education is to be attained. Vygotsky agrees that all the higher functioning by humans in any society originates from actual relationships between individuals and is perpetuated through language in cultural context.

Scaffolding and Zone of Proximal Development (ZPD)

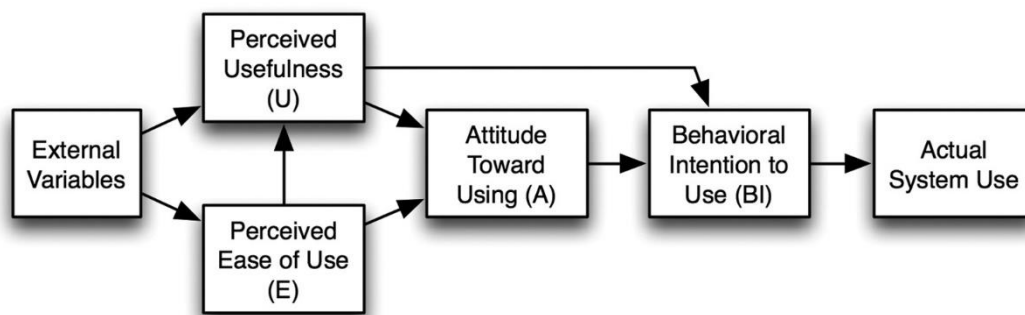
Sociocultural theory unearths that cognitive development of learners is limited to their Zone of Proximal Development (ZPD). Vygotsky (1978) delineates that ZPD is an area of exploration within which a child is cognitively graithed to explore but needs assistance from the more knowledgeable others through social interaction to fully develop. For the effective adoption and utilisation of ICTs in ECD settings, ECD learners need proper scaffolding to stut their evolving understanding and development of intricate life skills. Vygotsky defines scaffolding as the assistance or guidance offered to the novice by a more

knowledgeable other in performing a task. This therefore elaborates that through guided participation in utilising ICTs in educational activities, ECD learners can appreciate new knowledge, their culture and skills necessary for them to co-exist and survive in the current tapestry world of affairs which is technologically driven.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was propounded by Davis in 1989 in a bid to promote the adoption of ICTs in various sectors. TAM delineates that perceived usefulness and perceived ease of use for ICTs ditties the acceptance of such tools in any system. The adoption of ICTs in education recently received an international acclaim due to the Covid-19 pandemic which triggered the utilisation of new teaching and learning pathways when face-to-face lessons were abandoned due to the fear of the pandemic. Al-ruz and Khasawneh (2011) agree that from its inception, TAM was opinionated to be parsimonious, predictive, robust and was empirically tested making it fit to explain end users' acceptance behaviour for ICTs. The plethora of literature on TAM instigated the researchers to use the model in this study considering its precision to unearth the antecedents for the adoption and utilisation of ICTs in ECD settings.

Figure 1: The Technology Acceptance Model (TAM)



Retrieved from Davis (1989)

The TAM model by Davis clearly elaborates that there are a number of external variables that have impact on the adoption of ICTs in educational institutions. Most of these variables are encapsulated in the culture of a people among other environmental factors. Perceived usefulness and perceived ease of use lead to either positive or negative attitudes being formed in individuals or groups of people to either adopt or reject the use of ICTs in education. The behavioural intention by individuals to accept the use ICTs instigate the adoption and utilisation of ICTs in schools as shown in **Fig 1** above.

Conceptualising the sociocultural theory and technology acceptance model (TAM)

The need to merge the sociocultural learning theory and the technology acceptance model (TAM) in this study was envisaged by the desire to unearth pathways for the adoption of ICTs in ECD settings in social context. The entanglement of these two offered the researchers the pliability to uncover the phenomenon under study in relation to variables which include the culture of a people, experience, school-efficacy, the intricacy of ICTs and the state of knowledge available on ICTs in a country. **Bak (2020) concurs** that the adoption of ICTs cannot be done in isolation but in cultural context for the teachers and learners to be confident in utilising such tools in the teaching and learning process. Constructive adoption and utilisation of ICTs in ECD settings provide ECD teachers the authenticity to explore with ICT tools and integrate them in their day-to-day teaching for sustainable education.

3. Methodology

This study adopted an interpretivism research philosophy coursing qualitative research approach and phenomenological design. Creswell and Creswell (2022) delineate that research philosophy is a belief underpinning a study and it encompasses the way in which data are collected, presented and analysed in relation to the phenomenon under study. The research took an interpretivist philosophy to understand reasons why humans think and behave the way they do conceptually, in relation to the adoption and utilisation of ICTs in ECD settings. Interpretivism philosophy gave the researchers room to understand issues surrounding the adoption and utilisation of ICTs in the area under investigation through vigorous framework and continual cross-cultural issues which were studied in a social phenomenon.

Bak (2020) airs that qualitative research approach is an inquiry process aiming at understanding a social phenomenon in its natural settings basing on holistic paragon formed with words and describing full views of the respondents. The researchers took a qualitative research approach since it applies a social occurrence where meaning on the adoption of ICTs in ECD settings emerged through interaction. Creswell and Creswell (2022) allude that phenomenological design delve into lived human experiences and describes a phenomenon of interest from the participants' perspectives. The researchers fathomed to understand the insider's perspective of the research problem under investigation recurring in their natural settings. Phenomenological design according to Bak (2020) is usually descriptive or interpretive in nature. Twelve ECD teachers and three School Heads were purposively sampled to be informants in this study.

Data were collected through semi-structured interviews where Schools Heads were interviewed and ECD teachers completed semi-structured questionnaires. The researchers also made naturalistic observations in three schools which were visited to explore the research subjects in their natural settings and gather rich information on the utilisation of ICTs in ECD settings. Triangulation was also enhanced by the use of multi-research instruments which were applied to help in dealing with a number of biases in research. Metanarratives were used to present data which were collected. Thematic content analysis approach was adopted during the discussion of findings and the analysis of results was contextually done to generate data for answering the research problem. The presentation and analysis of results were done according to themes which emerged from the respondents' views as they relate to research questions.

4. Data presentation and analysis

The need for adopting ICTs in ECD settings

It emerged from this study that the adoption of ICTs in the teaching and learning process at ECD level was extolled as a mitigatory measure to curb myriad challenges which keep on recurring in the education sector due to a number of factors. Given below is a synopsis of reasons which were divulged by the informants in quest for the adoption of ICTs at ECD level in the Central Circuit of Hurungwe District in Mashonaland West Province of Zimbabwe:

Global alacrity for utilising online teaching and learning resources

The global acclaim by governments and Non-Governmental Organisations (NGOs) applauding the utilisation of online teaching and learning facilities in schools during the Covid-19 pandemic lockdown era is among the cruxes which proliferated the adoption of ICTs in ECD settings. Abizanda (2022) concurs that online teaching and learning facilities were adopted for use during the Covid-19 lockdown era when schools abrogated face-to-face lessons and extended their closure which forced learners out of school for almost two years all over the world. School Head 'A' seconded that:

‘The need for online teaching and learning forced schools to adopt ICTs in education. Most pupils lost the opportunity to learn during the Covid-19 lockdown era because of the lack of expertise to utilise online resources and platforms. Schools closed with immediate effect and parents and their children were never inducted to utilise online resources in education. Much learning opportunities were lost even for those pupils who were having access to ICTs and online resources. If one has resources and cannot utilise them, it’s as good as someone who has knowledge but has no resources to utilise in education, none of the two can learn.’

In the same vein, School Head ‘B’ denoted that:

‘The need to adopt ICTs in education was necessitated by the need to cover up the lost time which came as a result of Covid-19 pandemic. Schools were closed and pupils were not attending physical lessons due to the fear of the pandemic. Learners can now build new knowledge through accessing and organising information which brings creativity. By adopting online learning through utilising ICTs, pupils become innovative through the use of technology and are more capable of utilising information from multiple internet resources.’

School Head ‘C’ illuminated that:

‘Online learning triggered the adoption of ICTs in primary schools. There is no way where online learning resources and platforms can be utilised without ICT resources. ICTs are the base for online teaching and learning. Without ICTs online teaching and learning is not doable in schools.’

Submissions which were made by the School Heads were clear enough to show that online teaching and learning which was adopted during the Covid-19 lockdown era and continue to exist in the post Covid-19 era proliferated the adoption of ICTs in ECD settings. Online teaching and learning did not cease to exist in schools after schools re-opened and started offering physical lessons on campus. Mupfumira (2023) believes that there is need to re-image the education system and adhere to new pathways in the world where digital learning takes precedence in order to empower learners with the 21st century skills so that they can survive in the current world which has computerised most facets of human life. For this reason, the adoption of ICTs in education at ECD level is no longer a privilege but a need which schools cannot do without.

Learner-centred and self-directed learning

The exertion of ICTs in ECD settings is engaging, eradicates tedious learning were drilling and rote learning are orders of day-to-day learning. ICTs help ECD teachers and learners to meaningfully bestow technology in education. Singleton (2018) unveils that ICTs help learners to construct new knowledge through accessing information, selecting and organising data contextually. ECD Teachers ‘i’, ‘iv’, ‘viii’ and ‘xii’, all agreed that through using ICTs in the teaching and learning process at ECD level, pupils became more capable of using ICT resources and critical thinking is augmented. ECD Teacher ‘ii’ said:

‘ICTs avail more creative solutions to different types of learning inquiries. ICT resources are learner-centred, self-directing and more interesting to use in ECD settings. Learners can capitalise play-based pedagogy in ECD classrooms. ICTs allow pupils to learn through games.’

Utilising play-based pedagogy and games through ICT resources in ECD settings has edutainment value where ECD learners can learn in a gaming way. ICTs can proffer individualised assistance since some ECD software and e-books have some reading applications with reading-aloud interface, relevant vocabulary-building activities, games related to reading skills and vocabulary acquisition which suit the age of all learners and various cultures. This entails that ICTs involve specific designed applications that necessitate innovative ways to meet diverse needs of ECD learners.

Giangreco (2020) supports that ICT resources are adaptive for learners with disabilities making classrooms more inclusive and allowing all learners greater participation in a variety of activities. ICT resources in this case reduce communication barriers in ECD classes because assistive technological devices can be utilised with ease for the benefit of learners. In ECD settings ICT resources make the learning process easier and enjoyable for learners. Stevens (2019) agrees that clasping ICT resources in education make things possible while adhering to unique and specialised needs of every learner in the classroom. The adoption of ICTs in ECD settings forms the crux for learner participation, inclusion, cooperation and unity of purpose where learners can communicate their feelings and thinking in a more effective and interesting manner than before.

It emerged from the study that the adoption of ICTs in ECD settings provide learners with more time for active learning both inside the classroom and out of campus. Embracing ICTs in education according to Mupfumira (2023) proffer more opportunities for active learning outside the classroom, while adhering to self-directed spaces, such as blogs and forums, and open pathways to utilise games with a learning benefit.

Globalisation

Globalisation also emerged as another gist instigating the adoption of ICT resources at ECD level in schools. School Heads and ECD teachers who were consulted in Hurungwe Central Circuit ornated that education without ICT components is a mission to nowhere. School Head 'B' posited that:

'The world has become a global village due to globalisation and for this reason, the adoption of ICTs in education at ECD level is no longer by choice but a need in life. Remember in education we are preparing children for future life. For these pupils to be able to survive in the current world, they need to be ICT literate and competent enough to use ICT resources to provide solutions to problems faced by their communities.'

ECD Teacher 'x' supported that:

'ICTs are now part of human life and this is pushing schools to adopt ICTs in ECD classrooms. ICTs have now become culture of most people in Hurungwe and the country at large. Education is done in cultural context, that is why the adoption of ICT resources in ECD settings a must. Education and culture are inseparable.'

All the respondents were in agreement that the current intuition in education affirms the adoption of ICTs in ECD settings as a necessity for sustainable education. Globalisation has turned the world into a global village and the education fraternity is also following suit to remain relevant in the current world of affairs. Ogegbo and Aina (2020) believe that the adoption of ICTs in education promote collaborative learning among learners who are in distance-learning environments. Data collected from the respondents indicated that ICTs enable ECD learners to communicate, share, and work collaboratively from different places and seek for assistance or instruction from their teachers with ease using various platforms. By capitalising teleconferencing classrooms, ECD learners around the country or globe come onboard together simultaneously and learn about certain issues, analysing problems, exploring ideas and developing concepts.

ECD Teacher 'ix' indicated that:

'The adoption of ICTs at ECD level allows learners and teachers to share education information and learning experiences at community level, national level and globally. ECD learners can express themselves fully to their peers in the other side of the world and reflect on their learning.'

School Head 'A' aired that:

'The adoption of ICTs due to globalisation can bring harmony and tranquillity in the world because ECD learners can learn from their peers' culture in other areas and appreciate one another as brothers and sisters. Though adoption of ICTs in education does not bring all solutions to the challenges of people in communities, we need to capitalise its pros and reduce its cons for learner benefit.'

The adoption of ICTs in ECD settings is an indispensable notion in education. Most sectors which regulate human life on day-to-day basis such as health, agriculture, mining, tourism, commerce, music, politics and science have greatly adopted the use of ICTs in their systems thereby making it an apt in the education system at ECD level. In the current world of affairs, it's inept to talk of sustainable education without the adopting and utilising ICTs. The trance of ICTs in most areas of human life did not spare the education fraternity, thereby making its adoption a necessity in ECD settings. Empirically, there was robust evidence in form of data which were collected through observation, interviews and questionnaires, pointing that the adoption of ICTs in ECD settings cuts across all educational outcomes ranging from immediate, medium- and long-term outcomes.

ICTs are multi-disciplinary in nature

The respondents all agreed that embracing ICTs is pivotal for sustainable learning at ECD level because it cuts across all learning disciplines. The informants were of the idea that ICTs can be applied and used in any discipline at ECD level due to their flexibility to be adjusted to meet the specific needs of every learner and content. ICTs can be tailored to teach any content to anyone at any time thereby accelerating the learners' ability to pay attention and master the content because of their ability to mesh avenues for better understanding among learners.

ECD Teacher 'vii' stated that:

'ICTs can be used to teach all the learning areas in the ECD curriculum without problems. All the learning areas in the ECD curricula which include; English, Indigenous Languages, Mathematics and Science, ICT, PE, Heritage and Civic Education, VPA and Social Sciences are teachable using ICTs as compared to other tedious pedagogies where teachers are regarded as only sources of knowledge in schools.'

There was enough empirical evidence from the respondents that ICTs can be used to effectively teach any learning area, subject or discipline to ECD learners and achieve high quality outcomes. All the participants were in concordant to the idea that ICTs should not only be applied to the teaching of ICT as a discipline in the ECD curriculum but are to be taken as new pathways to teaching across all disciplines in the curricula. School Head 'C' indicated that:

'Most activities that we do currently in life are linked to ICT in one way or the other. For this reason, all learning areas in the ECD curriculum cannot be taught divorced from ICTs if our learners are to be instrumental in their societies after leaving school. Viable education programmes empower learners with skills which allow them to bring solutions to current problems in human life.'

Since the ECD curriculum in the country (Zimbabwe) is meant to address problems faced by humans in their context, all learning areas have a bearing in human life. From the ideas which were given by the respondents, it emanated that human life is driven by ICTs to a larger extent and the ECD curriculum in entirety is there to address human problems. This made the adoption of ICTs vital in the implementation of all disciplines covered in the ECD curriculum. In other words, teaching any learning area at ECD in

isolation without merging the process to use of ICTs is doing injustice to the learners, communities and the nation at large.

Stevens (2019) exonerates that schools need to integrate ICTs across all of the learning areas and disciplines; and among all learning levels. When ICTs are adopted at ECD level, learners are empowered to utilise technology for the attainment of higher levels of cognition across all learning areas within their social settings. The adoption of ICTs in ECD settings therefore does not only assist learners to acquire knowledge about the subject matter taught, but also leads to acceptance of ICT resources in the education fraternity thereby instigating skill development and perfection which are necessary life skills in the current world. Exposure in the ICT environment across all disciplines in ECD settings fosters learners' higher critical thinking skills needed for survival in the global village.

ICTs improve teaching and learning quality

The adoption of ICTs in ECD settings is regarded as a critical consideration for quality teaching and learning to ensure autonomy, capability and creativity in the education system. Autonomy refers to freedom and flexibility whereby learners can control and guide their learning process through the use of ICTs. ECD Teacher 'ii' argued that:

'The adoption of ICTs in ECD settings is vital because pupils become capable of working as individuals and with others in completing different tasks in education. Through ICT resources, teachers can assign learners certain tasks to work on as individuals, peers or groups either during face-to-face sessions or online.'

Singleton (2018) disclosed that ICTs foster autonomy by allowing teachers to make their own materials to use in class, thus giving them more control over course content thereby conceptualising ideas to learners' culture and background. School Head 'C' supported that:

'ICT resources improve the teaching and learning quality in the sense that they eradicate the chunk of paper work which is tedious in the education sector which saw a number of teachers paying a blind eye to real teaching devoting most of their time to record keeping which is mostly done manually in a number of schools in the circuit. Due to their usability, ICTs can be capitalised to effectively teach in ECD settings with teachers not overloaded by pen and paper; and chalk-talk-board practices.'

ICTs in this case reduced the burden of paperwork where teachers are required to carry large volumes of books and engage in tiresome writing activities. ICTs proved to be user friendly for both ECD teachers and learners. ECD teachers 'i', 'ii' 'iv' 'x', 'xi' and 'xii' agreed that ICTs are user friendly for both the ECD teachers and learners since teachers can assign tasks to be done and learners can work on such tasks at their own time and get instant feedback if system marking is applied. There are a number of take-home tasks which ECD learners can receive and work on these tasks in the comfort of their homes. Completing tasks maybe easier and interesting since at times pupils are given instructions on which browser, site, content and approach to use in order to solve the given problem. The researchers noted that ICTs break the four corner walls of the ECD classroom and bring learners closer to reality. At times the use of cartons, videos, movies and animations facilitate effective learning without having to embark on filed strips which might be expensive. There are experiments or explorations which are dangerous to do but ICTs can bring such experience in a classroom and effective learning is guaranteed.

How are schools embracing ICTs in ECD settings

This section delves on how schools in the Central Circuit of Hurungwe District are embracing ICTs in the teaching and learning processes at ECD level. Basing on the responses which were given by the

respondents, it showed that ICTs were not fully embraced in ECD settings in the teaching and learning process. Empirical evidence from the collected data showed that ECD learners rarely have access to ICTs resources in schools due to strict measures in place, which limit learners' freedom to utilise school computer labs. ECD Teacher 'vii' divulged that:

'I do not use ICT resources at this school for teaching and learning purposes because of the protocols which are in place which one has to follow to utilise these resources. At times you would need an hour to seek for permission to use a school computer lab for a lesson which lasts for about 15 to 20 minutes. This does not make any sense, dedicating such effort and time to be given only 20 minutes in the computer lab. In the end I ended up not requesting permission to utilise the school computer lab with my ECD class because it was not benefiting us but rather wasting time which I could have used productively with my class.'

Evidence collected from the research subjects showed that the systems which were in place in some schools like this one, were too rigid and unfavourable for ECD teachers and learners to utilise ICT resources during the teaching and learning process.

ECD Teacher 'iii' also supported that:

'ECD classes at this school are rarely allowed to visit the school computer lab. They occasionally visit there in groups of 10 per session under strict supervision of their class teachers and the computer teacher. Considering that I have a class of 50 ECD learners it's meaningless to pursue the use of ICT resources in our lessons. All things being equal, not all ECD learners would have a chance to visit the computer lab once per term for a period of 15 minutes. ECD learners need regular practice to master concepts being taught.'

School Head 'A' disclosed that:

'Our ECD learners at this schools do not have the flexibility to use ICT tools at the school because we only have 5 computers, that is 2 laptops and 3 desktop computers. ECD teachers usually visit this office to request for computers to show their classes basic ICT resources, that is computer parts and their uses. We do not allow learners to go on internet using the school facilities because the school does not have the capacity to pay for such services. For teachers they are allowed to do their research using school facilities and sent to parents what they need their pupils to do thereafter.'

With all the provided information, it was very clear that ECD learners among the investigated schools do not have the freedom to fully utilise ICT resources during their learning process. As indicated by some respondents, ECD teachers are the ones who have the right to visit the computer labs and utilise the Wi-Fi for preparing lessons. The adoption of ICT resources at ECD level in the circuit investigated was still a big mountain to climb due to a number of issues. This was also in line with Postholm and Moen (2020) who assert that in most primary schools, there is a great shortage of ICT resources and infrastructural facilities for using in lessons impeding modernisation of the education system towards sustainable education.

Scourges impeding the adoption of ICTs in ECD settings

A number of scourges which are derailing the adoption of ICTs in the teaching and learning process at ECD level were unearthed through interacting with the informants and observing visited schools in the Central Circuit of Hurungwe. Major scourges which were noted include: lack of funding, unavailability of reliable source of power, lack of ICT experts, negative attitude by school administrators, rigid curriculum and resistance to accept change. Each of these scourges is going to be elaborated below:

a. Lack of funding

All the respondents who were consulted were in concordance with the idea that lack of funding is the main barrier which acts as an instigation for effective adoption of ICTs in ECD settings. MoPSE (2022) states that lack of funds to secure ICT equipment is the major external barrier to the successful adoption of ICTs among schools in Zimbabwe. Hurungwe District is dominated with rural settings dominated by peasant farmers who at times can hardly feed their families. Peasant farmers have very few resources which are inevitable to support any meaningful ICT adoption and implementation programme. School Head 'C' noted that:

'A number of parents supporting this school are poor to an extent that they cannot own a cell phone. Do you think such parents can support the adoption of ICTs especially at ECD level? They do not value ICTs and usually sabotage all efforts you make as a school to embrace ICTs in the teaching and learning process.'

The respondents agreed that a number of ICT resources and supporting software are expensive and cannot be obtained by schools with ease. School Heads pointed that they rely on fees paid by learners on all their operations as schools. The informants agreed that parents are struggling to pay fees for their children and the finances paid are overwhelmed since most school operations entirely rely on these funds. Schools were seen to be financially crippled to support effective adoption of ICTs in the teaching and learning process at ECD level

b. Unavailability of reliable sources of power

The respondents argued that the adoption of ICTs in the teaching and learning system at ECD level is impeded by unavailability of reliable source of power. The researchers noted that three of the visited did not have electricity supply from the national grid. To make matters worse, one of these three schools received presidential computers which were donated in 2015. These computers had been lying idle in the lab and risking them having the operating system phased out due to a long period they were not in use. Such a donation is rendered as a wastage because the intended purpose was not saved. Manhibi (2019) supports that the national power grid does not supply electricity to all the parts of Zimbabwe, leaving a significant population relying on alternative power sources which are usually expensive. Schools which were visited which are served by the national electricity grid pointed that they experience erratic supply. School Head 'C' indicated that:

'We experience hard times here and then due to disrupted supply of electricity. We cannot not have a proper plan to utilise ICT resources for different activities worse still for teaching purpose. At times we can for 3 or 4 months without electricity especially during the rain season due to a number of faults which are experienced here and then. The responsible authorities at times do not attend to such faults with urgency. Some personnel need to be paid kickbacks to do their job. As for schools, we do not operate that way.'

This showed that the unavailability of reliable sources of power is another stumbling block derailing the effective adoption of ICT in ECD settings and their proper utilisation in the teaching and learning process.

c. Lack of ICT experts in schools

Robust evidence from the data obtained clearly showed that there is vast shortage of ICT experts in schools for the effective adoption and utilisation of ICTs in the teaching and learning programmes. Manhibi (2019) supports that shortage of ICT resources has a knock-on digital literacy which drives the adoption and utilisation of ICT services in education activities. The informants argued that in their schools a number of professionals were not competent enough to integrate ICTs in the implementation of the ECD curricula.

ECD teachers indicated that they were only trained to have basic ICT skills during their college training while others trained before colleges started embracing the use of ICTs in their teacher training programmes. It is hard for a teacher who is computer illiterate to utilise ICTs in the teaching process.

d. Negative attitude by School Administrators

It came to light for the researchers that some School Heads were having negative attitude towards the adoption of ICTs at ECD level. Data collected showed that some School Heads do not prioritise budgeting for ICT resources for use in lessons especially for the ECD department. Seven of the twelve ECD teachers who were consulted wrote that ECD learners do not have freedom to access ICTs resources in their schools because of strict restrictions which were put in place by the school administration. ECD Teacher 'iv' disclosed that:

'The ECD department is not given freedom to utilise ICT resources at the school as compared to other departments. The resources at this school are usually reserved for administration, examination processing and Grades 6 and 7 which are regarded as exam classes. ECD learners are not allowed to go to the computer lab since they are seen as too playful and potential individuals who can damage ICT resources easily.'

The evidence which was availed by most ECD teachers showed that ECD learners do not utilise ICT resources as compared to their counterparts in upper grades. It was clear that the ECD department in other schools is seen as a less important department. Other administrators treat ECD as a playing phase thereby seeing no sense to adopt ICTs in the ECD department. ECD learners are the most vulnerable group in primary schools who are usually neglected in the provision of ICT resources for use in their learning process.

e. Rigid curriculum

It was noted by the researchers that the ECD curriculum which is operation in Zimbabwean schools is inflexible for the effective adoption of ICTs in the teaching and learning process. ECD teachers disclosed that there are policies and circulars which mandate them to adhere to certain written exercises on weekly basis. It emerged that adherence and compliance to policy circulars in education is 100%, forcing ECD teachers to abandon the use of ICTs in a number of activities thereby grounding their teaching and learning to pencil / crayon and paper activities. The respondents argued that their employer only appreciates that teachers are working basing on the amount of written work available in learners' books and portfolios nothing more. This was seen as another hitch obstructing the adoption of ICTs at ECD level. The teachers were also complaining that the curriculum is overpacked to an extent that it is not all that flexible to embrace ICTs in the teaching and learning process. Other teachers were of the idea that compartmentalising the ECD curriculum into independents learning areas made it inflexible to fully adopt ICTs in the teaching and learning process.

f. Resistance to change

Empirical data was available showing that a number of ECD teachers and school administrators were adamant to adopt the use of ICTs as new pathways to teaching and learning. Technophobia among a number of aging educators in the ECD department made a number of the teaching staff adamant to appreciate the adoption and utilisation of ICTs in ECD settings. In some cases, the community was noted to be sabotaging the adoption of ICTs in schools. At one of the schools which was visited, the researchers noted metal frames which were fitted during the installation of solar panels but the panels which were donated to power the computer lab were stolen. No solar panel was left except for the frames. Some community members were said to be against the adoption of ICTs on religious grounds where their

religious denominations believe the use of advanced technology as an unholy practice. Other members in the communities were said to hold a belief that ICTs proliferate moral decadence and indiscipline among learners thereby disrupting efforts in education to adopt and utilise ICTs in the teaching and learning process at ECD level.

Strategies for quintessence adoption of ICTs in ECD settings

There is need for devising quintessence strategies to curb challenges obstructing effective adoption of ICT resources at ECD level. Traditional pedagogies in the education fraternity need to be supported through effective adoption of ICTs as a way of fostering learner-centred and play-based pedagogies. Mafang'ha (2016) echoes that there is need to empower educators with competent skills to use ICT resources in the teaching and learning process. The mandate of teacher training in Zimbabwe rests in the hands of Teachers' Colleges and Universities. The respondents supported that teacher training programmes need to fully embrace ICTs so that teachers who are produced by these institutions of higher learning are competent enough to use ICTs for teaching and learning process.

The respondents cited an urgent need to revisit the ECD curriculum and make it flexible enough for ECD teachers to properly adopt ICT resources with ease. Other ECD teachers called for the need to make the ECD curriculum a single unit and do away with various learning areas which are congesting the curriculum for no valid reasons. The argument was that there were a lot of duplications in various learning areas in the curriculum which is a bit confusing. The need for having friendly and realistic policies which are flexible to work with in ECD settings emanated as another area that needs attention. The government should revisit ICT policies in education and establish an enabling policy environment to promote the adoption of ICTs in ECD settings.

There is need for multi-stakeholder collaboration in a bid to foment access to ICT infrastructural facilities and provision of the internet. The research subjects indicated that for the adoption of ICTs in education to be a success, there is need for multi-stakeholder collaboration from all influential departments. Noted key stakeholders include ECD learners, ECD teachers, NGOs, school administrators, parents, District Schools Inspectors' Offices, Provincial Education Officers, National Directorate, Permanent Secretary for Education and the Minister of Education, the Curriculum Development Unit (CDU), religious groups, community leaders, politicians, the business community and other government ministries. School administrators were seen as key stakeholders who should have positive attitude towards the adoption of ICTs in education. Qingdao Declaration (2015) concurs that NGOs should assist schools especially those in rural areas to harness ICT resources and the installation of other support infrastructural facilities needed for ICTs to function through donations and funding.

5. Conclusions and recommendations

5.1 Conclusions

This research came up with a number of conclusions on the quest for the adoption of Information Communication Technologies in ECD settings in the Central Circuit of Hurungwe District Schools. The study found out that the respondents noted that the adoption of ICTs in the education fraternity at ECD level is the way to go due to globalization and the adoption of online learning. ICTs were believed to be motivating, child-centred, promote active learning, play-based pedagogy, flexible, effective, reduce paperwork on the teachers' side, proffer solutions to real-life problems, bring reality closer to learners and encourage collaborative learning among learners. The adoption of ICTs was also seen as the potential area

which might also encourage schools, communities and other stakeholders to work together with a unit for purpose.

In the endeavour to foster the adoption of ICTs in ECD settings, there are a number of hitches which militate against such eminent strides towards sustainability in education. Among these challenges the major is lack of funding to secure ICT resources and support the adoption and utilisation of these resources in the education sector. The study noted that primary schools in rural settings are financially crippled to an extent that some of them hardly own the basic ICT tools. The government was noted not to be supporting such underprivileged schools to secure ICT resources. This led to a conclusion that without proper funding in primary schools, the adoption of ICTs in ECD settings remains a mere dream.

The culture and social life of a people were rendered to be crucial as well in the adoption of ICTs in ECD settings. The study noted that if the people in the community do not appreciate the adoption of ICTs in ECD settings, all efforts will die a stillbirth. The researchers therefore concluded that for the adoption of ICTs in ECD settings, there is need for the schools to continuously engage the community leaders and influential members of the community and work with them hand and glove in all projects done in schools in a bid to adopt ICT resources in education.

It emanated from the study that some school administrators have negative attitude towards embracing the adoption of ICTs in the teaching and learning activities at ECD level. This was noted in places where strict restrictions were in place to deny ECD learners the access to the school computer lab. The study concluded that such school administrators need to be staff developed to abolish such bad practices. Clear policies also need be formulated of ICT adoption so that anyone who is found in the wrong court is penalised. This was necessitated by the idea that most school administrators understand policies more than anything else. It was also noted that a number of teachers were also lacking the expertise to effectively adopt ICTs in the teaching and learning activities in ECD settings. The therefore concluded that teacher training programmes are not fully empowering trainee teachers with the necessary expertise to utilise ICTs in the teaching and learning situations. It was also concluded that a number of aging teachers have technophobia in using ICTs in delivering lessons or giving take home tasks or homework to learners.

Lack of learner involvement in planning for ICT programme was also noted to be another challenge hindering progress in the adoption of ICTs in the teaching and learning process at ECD level. The study concluded that if the adoption of ICTs in the education sectors at ECD level is to be a success, the side of the ECD learners has to be heard and consider their interest in ICT programmes and projects in the school plan.

5. 2 Recommendations

From this amassed enough data pointing that ECD is a delicate stage in human life where perfect foundation for future learning and life skills are laid. The study noted that the adoption of ICTs in teaching and learning at this stage is the gist for sustainable education in communities. Basing on these ideas, the study came with the following recommendations:

- The Ministry of Primary and Secondary Education (MoPSE) must consider in-service training of ECD teachers on how to utilise ICT resources at ECD level.
- Government and NGOs need to collaborate with the primary schools towards providing financial to ensure that all the necessary infrastructural facilities needed in the adoption of ICT resources at ECD level.
- Parents and community leaders are key stakeholders who should offer social support, towards achieving effective adoption of ICT resources at ECD level.

- The schools should create a means of sensitizing the ECD pupils on how to utilise ICT resources for school work issues and avoid dangers of misusing these resources.
- The school curriculum must critically include the utilisation of ICT resources across the whole ECD curriculum.
- The school administrators and the government should be serious budget for ICT resources which are ECD specific for effective adoption ICTs in ECD settings.

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