DIGITAL LEARNING IN THE EARLY YEARS: THE GOOD, THE BAD AND THE UGLY

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Abstract

In the global world today, technology plays an important role in every sector of human life including education. In Nigeria today, teaching and learning has resorted to the use of e-learning as an alternative to the conventional classroom. E[learning technology is becoming increasingly popular in schools as it is used for teaching, tutoring, managing learning contacts, providing assessment, to mention a few. As many parents have little or no time to interact with their children at home, children have no option but to entertain themselves with digital gadgets. This paper therefore explains the concept of Early Childhood Education, define Digital learning and identify forms of digital learning. It also enumerates the good/benefits of e-learning in early childhood education. The paper concludes by emphasizing the bad and the ugly sides of digital technology, especially as it affects the learners. It also recommends possible guides and measures that will ensure the safe use of digital learning in the early years

Keywords: E-learning, Early Childhood Education, Early Years, Teaching, Learning, Learners.

Introduction

The world is changing rapidly in the 21st Century, and digital technology is likely to have a major impact in every area of human life. In fact, the illiterate in this century will not be those who can neither read nor write alone, but those who cannot learn, unlearn and relearn. The rapid and widespread adoption of online and open access services and technologies are the consequence of evolving media narrative in which human interaction and engagement have evolved from traditional face-to-face conversations through symbolic representation system (e.g. Print and books) to audio-visual transmissions (e.g. Radio and television) into digital networked formats (e.g. Computers) (Dabaghand Reo, 2011) The traditional telephone is being replaced by alternative modes of communication; analogue radio and television broadcast has been replaced by digital networks which allow personalized choice, and face to face meetings have shifted to human-to-machine interfaces

The impact of Information and Communication Technology (ICT), a term used to describe any hardware and software in use, was recognized in 2000 by the World

Economic Forum (WEF). Since then, the term digital technology is used to describe not only desktop computers, but also includes portable mobile devices such as smartphones, game consoles, digital cameras, media players, netbooks, and hand-held computers (Traxler, 2010). Almost everyone owns one, uses one, and as he points out, often has more than one. Such devices, he suggests, are pervasive, ubiquitous, conspicuous, unobtrusive, noteworthy and taken-for-granted. Their roles are new and completely different from older, static, and less personal information technologies such as desktop computers. Within this period of change is the internet which has been predicted to transform learning in the 21st century, in the same way electrification transformed learning in the 21st century (Brown & Duquid, 2000).

The discussion about the use of digital technology in education has shifted therefore, from approach based on whether they are 'good' for children to 'how' they can be used in order to enhance children's learning. In support of this view, Resnick (2002) questioned the way education views learning and suggests that in education, there is a need to rethink learning in this digital age. He proposed that it is essential to re-conceptualize school classrooms, claiming that instead of a centralized control mode (with the teacher delivering information to a room full of students, we should re-examine teaching approaches, curriculum subjects and methods, sizes of classrooms and places that learning takes place. He echoes the vision of bridging the global digital divide (World Economic Forum, 2000); that the internet 'will open up new learning opportunities, enabling new types of knowledge building communities in which children and adults around the globe collaborate on projects and learn from one another (Resnick, 2002).

Digital technologies integration into the daily lives of children and its influence on their cognitive, emotional, and social development continues to increase day by day. Technology offers many opportunities for children to play, explore, and learn (Linebarger & Piotrowski, 2009). Since the brain of children are extremely flexible at this period, these learning opportunities constitute a critical developmental point in children through the natural exploration of their own world, new connections between neurons are formed and existing connections are strengthened (Blanchard & Moore, 2010).

Concept of Early Childhood

The National Association for the Education of Young Children (NAEYC) defines early childhood as a period from birth to eight years (Brewer, 2007). According to Oduolowu, Akinbote & Lawal (2001) early childhood period varies from 0 to 8 years. It is regarded as a stage of life covering the period of birth to toddlerhood, 0 to 24 months, and play years 2 to 6 years. It is a period that most development takes place in a child.

Concept of Digital Learning

Olaniyi (2006) defined digital learning as all about learning that occurs at the use of network technologies to crate, foster, deliver and facilitate learning anytime, and anywhere.

Kamba (2009) refers to digital learning as self-paced, provides consistent content, faster and works anywhere and anytime for learners. The instructional materials are easily updated and

permit the use of multimedia which leads to video, audio, quizzes and other forms of interaction. Olaojo, Adewumi & Ajisola (2012) describe e-learning as any technological mediated learning using computers whether from distance or in face-face classroom (computer assisted learning). They went further to describe it as a shift from traditional education or training to ICT-based personalized, flexible, individual, self-organised, collaborative learning based on a community of learners, teachers and facilitators.

Forms of Digital Learning

With reference to Ebeh (2019), there are different forms digital learning. They include:

1. Web-Based Learning which is a form of learning that is accessed through web browsers or through the corporate intra-net. It is user-friendly medium to deliver training because of the compatibility of web browsers with videos, audios, animation and other media elements. Its advantage is that the learner can access it at their own pace, within a set time, without travelling to the learning centres to attend the training.

2. Mobile Learning which is in form of digital learning in which the training materials accessed by learners through mobile devices like mobile phones, Ipad, tablets, anywhere, any time with just a few taps. It is breakthrough in the e-learning world. This form of digital learning allows students or individuals go discuss, collaborate and learn with their peers across the globe.

3. Computer-Based Training which is a form of digital learning that is accessed offline on computers. It uses various multi-media elements to engage the learner. Computer-based training allows learners to learn at their own pace, and the training progress is tracked by the computer, which assigns grades instantly. The instructor can also track the training progress.

4. Webinar which is a form of digital learning delivered over the web, using video conferencing software. Different sorts of training can be delivered through this form. The advantage of this mode is that one can host a large group, interact and brainstorm, and share applications with other participants.

5., CD-ROM Based Learning by which the training is recorded into compact discs and accessed on the system without any internet connection. It is an outdated mode of digital learning. However, in recent time, digital learning has progressed a long way from CD-ROM to mobile learning.

6. Virtual Classroom by which learners can access training right from the comfort of their own places or even homes and or offices. This mode adopts various synchronous technologies such as web conferencing, video conferencing, and so on, to enable global learners participate, communicate with one another and view videos at the same time. Being an e-learning programme, the learners need not to travel to attend the session, thus saving transport costs.

7. Collaborative Learning by which both the instructor and learners share knowledge either on or offline. The learner gains knowledge through interaction, and those who could not

make it to the online session can partake in online forums, live chats, instant messaging and used message boards.

8. Custom E-Learning whereby one can develop course content to suit one's requirements. No license is needed to access the courses with limited system requirements and gain personalized learning experiences. This mode delivers what the learners expect.

9. Off-the-Shelf Digital Learning by which comprises training materials that are already developed and ready to be used by the end users. The best part of the catalogue in e-learning courses is that, they fulfill the urgent training requirements and deliver content in multiple languages. They are also cost-effective to train small departments.

The Good of Digital Technology in Early Childhood Education

The effect of the use of digital technology on the development of young children is ever increasing in the world around us today. Digital learning offers many opportunities for children to engage positively in imaginative, active learning. It motivates them, provides them room for practice, reassures them, builds confidence in them and encourages children to persist in taking the next steps in learning, and builds their self-esteem.

Maureen, Ruth and Paul (2010) listed some benefits of digital learning in early childhood education as follows:

- A programmable toy could be used to develop a range of skills. Children learn that pressing buttons causes an action, that they can control the action left, right, forwards, backwards, and that the number of presses equals the number of moves. Critically, a programmable toy can put the child at the centre of the learning process as they learn how to programme a toy to perform a particular action.
- An overhead projector introduces children to shadows and patterns, while also being a motivating tool to display and share learning.
- Musical keyboards can encourage moving to reading and creating patterns with sound.
- Metal detectors can help children identify differences in materials particularly useful for encouraging children to explore the outdoor environment.
- Walkie-talkies can encourage children's use of language, and they can use this equipment to share experiences, connect ideas, explain what is happening and recall and relive past experiences.
- The use of a digital camera can encourage children to reflect on past experiences, observe details, share personal likes and dislikes, sequence events, record and share a significant event.
- An interactive whiteboard brings a new dimension to a learning environment. It immediately captures children's attention by the impact of the images, the colour and the control that it gives children. As a very good motivating tool, children can use it independently to paint, draw and explore their environment. An interactive whiteboard is particularly effective for sharing experiences; for

example, small groups of children can all collaborate and, importantly can all partake in the activities.

- Software can bring in different environments for children to explore which, otherwise may be impossible for them to gain experience of. With a computer, other applications become possible: access to the Internet and its widening range of resources for learning, webcam for seeing themselves, and their activities through digital microscopes to investigate with and digital camcorders.
- Cassette recorders and MP3 devices can encourage children to listen to and retell stories.
- Information and communication technology is particularly enabling for children with special educational needs; it can provide access to experiences that might be hard for some children to access through any other means and thereby aid children's learning and development. It is also highly motivating, can help build children's confidence in their abilities and is an excellent focus for social interaction.
- Information and communication technology added to role play reflects the real world, builds on children experiences and allows them opportunities to understand how, why, when and where different forms of technology are used in everyday life. Environments such as shops, cafes or offices can be set as role play areas, making use of ICT to record and access information with a real purpose in mind.

Digital Technological Tools and their Risks

Many risks have been reported by researchers to affect children while using technological tools. They include:

1. **Television -** Television plays an active role in children's world because it is visually and auditory captivating, and its entertaining nature. It has been reported that excessive watching of television and videos by children less than two years, can affect their language development and create behavioural disturbances in them (Chonchaiya & Prusanandaonda, 2008; Mystery, Minkovitz, Strobino & Borzekowski, 2007).
2. **Computer -** The computer has become an indispensable element in the life of children. Spending a lot of time on the computer from an early age has been proved to have a negative effect on the academic success of children, due to low concentration, lack of attention and disorganization, under-developed language skills, creativity and imagination seen in children, as a result of excessive use of computer (Cordes & Miller, 2000; Palmer, 2015).
3. **Internet:** Early literacy activities on the net opens a lot of opportunities and makes a lot of impact on children. The net offers both intentional and unintentional learning which gives children easy access to illegal, violent, sexual content and communication with dangerous people around the world (Iscibasi. 2011)
4. **Video Games:** Video games have been reported to have effects on children. It can lead children to aggressive behaviour and inhibit creative game play. Studies have shown that there is a strong link between violence in video games and real

life violence, and that these games lead to social isolation and lack of communication (Kutner & Olsen, 2008).

5. **Smartphones:** An increase in the use of smartphones by children has been reported to be associated with passive, aggressive, unprotected, socially incompatible obsession, addiction and anxiety. It has been reported that children engage with their smartphones during school, negatively affecting both the owners and their classmates' attention (Sevi, Odabasioglu, Genc, Soykal & Ozturk, 2014; Yen et al. 2014).
6. **Digital Toys:** As these have become an indispensable part of children's daily lives, the increasingly reduced use of outdoor playgrounds ,may negatively affect the normal development of children. For a normal development, children need to spend their time with their peers (Rosen et al., 2014).

The Bad and the Ugly of Digital Technology in Early Childhood Education

In spite of the benefits of digital technology to early childhood education, it also has its negative effects on children's education, especially when devices are inappropriately used in terms of content, duration, frequency and the posture that the users adopt while using them. All these result into health risks, cognitive and behavioural challenges, displacement of traditional developmental activities and lesser interpersonal interaction. These risks are more pronounced when technology is used or applied in a passive manner, with violent or aggressive content and developmentally deleterious applications. Some of the risks include:

1. Socio-Emotional Risks: As a child grows and develops, he is expected to interact and develop cordial relationships with people around him, both his peers and adults. However, with too much spent with technological devices like smartphones, laptops, tablets, and so on, the child usually finds it difficult to relate well with other people. Therefore, Kara (2019) issues a note of caution that there must be a balance with human interaction as a child develops socially and emotionally. This is in consonance with Alvin (2014) who postulated that technology must not replace human interaction but should rather enhance it. The American Academy of Pediatrics has also expressed the need for caution on the use of technology in the early years, and its impact on the child's social and emotional health. Moreso, as they discovered a correlation between viewing violence on TV or in video games and aggressive behaviour in children. In an overview of studies that focused on children with identified behavioural deficits and emotional difficulties, it was found that children manifesting aggression, who are more likely to inflict harm on others, were imitating what they had already seen in war games and violent films. In contrast, children who were not exposed to such negative media were more friendly, emotionally stable and formed positive social relationships (Miltrofan et al, 2008). This is in line with Kerner (2015) who postulated that toddlers are twenty-two times more likely to transfer what they see and learn from technology into everyday life. In another study that focused on children, it has also been reported that children themselves and their families who watched violent and horror contents were likely to experience insomnia, restlessness, and headaches (Mitrofan et al., 2008).

As pivotal brain development occurs from birth to age three, when the brain learns and develops outside stimuli, overstimulation, such as excessive exposure to digital screens,

has been reported to hinder the development of the brain, specifically the frontal lobe which is said to be more prone to being affected. This part is responsible for social skills and feeling of empathy. The underdeveloped frontal lobe can cause issues later on with impulsivity, hyperactivity and emotional regulation. It has also been discovered that over-exposure to the screen can also lead to greater chances for attention deficit, hyperactivity disorder (ADHD), mood disorder, anxiety, and personality disorder (Yau et al., 2012). Technoference is a term used to describe the interruptions from electronic device in times spent with others and personal interactions. Research has shown that everyday activities such as mealtimes or playtime can experience technoference, and therefore has an effect on the relationship between parent and child, including fewer interaction, lowered responsiveness and increased frustration and hostility in the family (McDaniel and Radeski, 2018). In their own study, the American Academy of Pediatrics (2016), has cautioned the use of technology as a way of calming down frustration and disappointment in a child. But rather children need to learn appropriate ways to regulate emotions on their own without relying on technology.

2. Literacy Development Risks of Digital Learning: There are a lots of kids' apps that support literacy on the internet. In reference to the American Academy of Paediatrics (2016), a study of over 300 kids' apps revealed that only about 50 are educative (Neuman & Neuman, 2014). This points to the fact that not all kids' apps are beneficial to the children. This reveals that negative effects are inevitable when the wrong contents are presented to children on technological devices. Another risk associated with e-books according to the US Department of Education (2016) is the popular use of e-books as bedtime stories. They cautioned the use of e-book as bedtime stories because of the backlight emissions and the effect on sleep. As pre-writing is another area of early literacy development in young children, in that the apps that allow for touch screen tracing and letter/word formation lead to an extension of traditional writing. This points to the fact that if care is not taken, digital writing can lead to traditional handwriting becoming unnecessary.

3. Language Development Risks of Digital Learning: Language development in children can be affected by the use of technology. As children can learn new vocabulary from educational apps, such as interactive programmes that encourage them to speak and participate, can positively impact language use and vocabulary (Russo-Johnson et al., 2017). On the other hand, excessive exposure to low quality media can have deleterious effects on children and hinder language development in them (Lerner, 2015).

Another concern raised is that if children do not participate inn face-to-face conversations, they lose out on social communication norms such as interpreting cp0ntents and formality (Watt,2010) In another research carried out by Bed ford et all (2016) regarding the early use of technology by infants and toddlers and their language development, the children involved in the study, using technology on average, began using two-word utterances at roughly the same time, as peers with no technology experience, leading the researchers to suggest that language development hindrances from technology use, may become a concern ion later childhood (Bedford et al., 2016)

4. Health Risks of Digital Learning: A steady increase in the use of digital technology at home and school, has been reported to cause an increase in musculo-skeletal problems

(Harris & Stracker, 2000; Kelly, Dockrell & Galvin, 2009). Musculo-skeletal disorders such as physical factors as sex, age, body mass index (BMI), and exposure to sedentary activities are reported to affect children. For this reason, playing with toys should be encouraged in place of watching screens in order to minimize the potential of musculo-skeletal disorders and sedentary lifestyles (Harris, Stracker, Pollock & Smith, 2015).

According to Hancox & Poulton (2006), for children to enjoy a healthy development, they need three to four hours of daily physical activity and social interaction. Excessive use of technology has been linked to lifetime obesity and cardiovascular risks. This has been traced to early childhood exposure to technological devices (Bel-Serrat et al., 2013). The excessive use of social media during the school period is associated with low, but significant increases ion BMI, laying the groundwork for weight gain in later childhood (Cox et al., 2012). In another research, less sleep has been associated with keeping a television, computer and a mobile phone during early childhood (Cespedes et al., 2014). Children who make excessive use of the social media or who sleep with mobile devices in their bedrooms are at an increased risk of experiencing sleep disorders (Levenson et al., 2016). The American Academy of Pediatrics (2016) has outlined many potential risks related to technology use by young children. They reinforce that many executive functions such as persistence, impulse control, emotional regulation, creativity, and flexible thinking, are best learned through unstructured play and not on digital screen. They proved further that children under the age of two, get very little benefits from technology, proving that the limited learning that may happen through technology is not easily transferred to the real world. They therefore set a guideline for children under eighteen months, not to have any screen time, and children of two to five should have one hour or less per day of only quality content screen time.

Possible Guides or Measures to Ensure the Safe Use of Digital Tools

Technology can be effective for children's teaching and learning when it is used intentionally and in a developmentally appropriate manner. Care should be taken in selecting computer software that is developmentally appropriate for children, who will use them. Mayesky (2012) quoting Clement & Samara (2003) states the following criteria to choose software that is developmentally appropriate for children.

Care must be taken in selecting computer software that is developmentally appropriate for children who will use it. Mayesky (2012) quoting Clement and Samara (2003) shows that different types of software have different effects. According to them, the following criteria distinguish software that is developmentally appropriate.

- **Age Appropriate**: The concept taught and their method of presentation should reflect realistic expectations for young children.
- **Child Control**: Children are active participants, initiating and deciding the sequence of events rather than reactors, responding to pre-determined activities. The software needs to facilitate active, rather than passive involvement.
- **Clear Instruction**: Because the majority of pre-school children are non-readers, spoken directions are essential. Therefore, printed instructions should be accompanied by spoken directions. Directions should be simple and precise. Graphic accompanied choices to make options clear to the children.

- **Expanding Complexity**: The learning sequence is clear; one concept follows the next. The software expands as the children explore, teaching the skills they are ready to learn. Through the expanding complexity of the software, children build on their knowledge.
- **Independent Exploration**: After the initial exposure, children can manipulate the software without adult supervision.
- **Process Orientation**: Children learn through discovery rather than being drilled in specific skills. Motivation to learn is intrinsic in children, not the result of praise, smiling face, sticker or prizes.
- **Real World Representation**: The software is a simple and reliable model of some aspect of the real world, exposing children to concrete representations of objects and their functions.
- **Technical Features**: The software has a high technical quality that helps the children pay attention. It is colourful and includes uncluttered, realistic, animated graphics. There are realistic sound effects or music that correspond to objects on the screen. The software loads from the disc and runs fast enough to maintain and sustain the child's interest.
- **Trial and Error**: The software provides children many chances to test alternative responses. Through resolving errors or solving problems, children build structure and knowledge.
- **Visible Transformations**: Children have an impact on the software, changing objects and situations through their responses.
- **Bilingual Students**: Translation of both languages, preferably in real time is an important feature. A programme that allows the children to toggle between languages provides instant translations of each page.

Conclusion

Technology comes with both benefits and risks associated with early use by children. It is also clear that the developments in digital technology and research on these products will continue. Technological developments are largely variable, and the effects also depend on the type of device, the type of use, the amount and extent of use, and the characteristics of the child or adolescent. Since children are currently growing up, using highly personalized technology, parents and teachers should strive to ensure that they are able to implement and benefit from the principles of balanced nutrition, quality sleep, adequate physical activity and positive social interaction for healthy growth and development, by making plans according to the age, health status, character and level of development of their children. However, parents and teachers should also be aware of their duties in modeling appropriate technology use while also striking a balance between technology usage and other activities.

Recommendations

In viewing the good, the bad and the ugly side of digital learning in early childhood education, the following recommendations are hereby put forward for consideration:

- The total technology usage time during the day, for example, watching television and playing games on the computer, tablets and mobile phones, should be limited to one or two hours at the most.
- Care must be taken that children age two or younger be not allowed to face the screen.
- Television and technological equipment connected to the internet, should be kept away from children's bedroom.
- If children are allowed to use these devices, the use must be subject to certain rules.
- Mealtime and bedtime must be kept free from the use of technological devices including cellphones.
- Reasonable and firm rules for cellphones, television, computer games, internet, and social media use should be established and they must not be compromised.

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