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MANAGEMENT OF TECHNOLOGICAL DEVICES IN EARLY CHILDHOOD CLASSROOMS FOR SUSTAINABLE NATIONAL DEVELOPMENT

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Abstract: The paper investigated the management of technological devices in early childhood education classrooms for sustainable national development. The study was theoretical and as such data for the study was collected from secondary sources of data such as journals, textbooks and the internet. The concept of technological devices, early childhood and sustainable national development were discussed. Furthermore, regulations to the use of technological devices in early childhood classroom were discussed as well as the relevance of technological devices in early childhood classroom. The study went further to highlight the challenges encountered in the use of technological devices in early childhood centres such as teacher's incompetence, lack of technological devices among others. Suggestions and way forward were also provided in the study which includes training of teachers as well as regular supervision of early childhood centres for meaningful and safe teaching and learning activities in these schools.

Keywords: Technological, Devices, Early Childhood, Classroom, Sustainable National Development

Introduction

It is often said that the world is a global village and technology is gradually driving every sector of the economy. This has no doubt contributed to the development of today's world fastest growing economies. There is virtually no sector of the economy where technology is not being used for improving human life and society. Similarly, present technological achievements world over are being reviewed for the purpose of achieving improved standard of living as well as societal growth and development. It is therefore obvious that any individual or society that fails to embrace this advancement in technology may be left in the dark and unable to function in a modern society. In fact, scholars such as Egbogah (2012) pointed out that countries such as Nigeria have been able to manage their poverty level because of the adoption of technology. Technology is therefore a vital tool in any sphere of life which must not be ignored b any nation that intends to achieve sustainable growth and development.

However, the advancement in technology makes little or no sense without empowering the masses on how to use these innovations for personal and societal benefit. Countries that have advanced technologically are those that empower their citizens on how to develop and utilize the right technological devices for the advancement of the society. This campaign for the embrace of technology has been driven down to the education sector among most of the developed economies where students are being taught on the use of technological devices for the purpose of sustainable national development. It is therefore important for students to be taught how to use modern technological

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devices for their day-to-day activities which will help any nation to achieve sustainable development.

Educational stakeholders have pointed out that there is no age that is too early or late for citizens to embrace the use of technological devices. However, trend has revealed that most of the countries that are experiencing a fast rate of development are those that have prepared their citizens to embrace the use of technology especially at an early age such as those in early childhood schools. It is believed that when pupils from early childhood schools are exposed to the identification and utilization of technological devices in their classroom, they will grow up to continue meaningfully to the sustainable development of their nation.

Technological Devices

The concept of technology is often defined by different people in different ways based on the context of usage. However, Zomer and Kay (2016:2) stated that "technology refers to digital technologies in the form of hardware (e.g., interactive whiteboards, tablets), stand-alone software (e.g., CDROMs, e-books), and online learning tools (e.g., Monster Exchange, ABRACADABRA)". Technology is also seen as the intelligent application of scientific discoveries for solving the day-to-day problems confronting man. It can therefore be deduced that technology is any technique or skill that is used to simplify the process of producing goods or rendering of service.

Anaeto, Asiabaka, Ani, Nnadi, Ugwoke Asiabaka Anaeto and Ihekeronye (2016:39) pointed out that for any technology to be accepted for national development, it must meet the following conditions; simple and easy to understand, manageable, inexpensive, flexible, adaptable to changing needs, technically feasible, locally serviceable, employment generation potential and infrastructural compatible and compatible with the people's cultural practices. These features make the users of technology comfortable to adopt these innovations for their day-to-day activities.

Based on the definition above, it can be said that technological devices refer to any product or object developed from scientific knowledge for simplifying the basic activities carried out by man. Similarly, technological devices are any object developed by man to simplify the process of creating, sharing, storing and managing information. Basically, technological devices are needed for simplifying the process of interpersonal relationship among a group of people.

In pre-schools such as early childhood education centres, there are varieties of technological devices which children are expected to be exposed to. The endless list of technological devices which can be made available in early childhood education centres include but is not limited to television, smartphone, digital camera, computer, audio-visual devices and any other device that can be used for managing contemporary information. Technological devices are therefore essential electronic objects that are needed for solving basic problems confronting man.

Early Childhood Classroom

Defining early childhood classroom will be better understood by first understanding what early childhood education is all about. According to European Expert Network on Economics of Education (2018:13), early childhood is traditionally regarded as the period from birth to age 8 of an individual's life. Therefore, it can be deduced that early childhood education is any formal learning experience provided for children below the age of eight. Educational scholars have pointed out repeatedly that this stage is a period in the life of child that is among the most formative and essential for future development (e.g. in physical, social, emotional and cognitive terms). It is therefore an essential stage in the life of the child where the quality of educational service provided is of utmost importance. This stage has a profound and long-lasting impact on a person's future, as is evidenced by abundant

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research across different disciplines, such as neuroscience and psychology (Van-Laere, Peeters & Vandenbroeck, 2017). The learning experience provided at this stage therefore refers to early childhood education.

There are different types of early childhood education that can be provided for children below the age of eight. Early childhood education can be unitary or split, center-based and home-based as well as public or privately provided centres (European Expert Network on Economics of Education (2018). The type of early childhood education depends on the purpose the education is expected to serve as well as the ownership of such centers as well as the target beneficiaries. Lewis (2019) opined that early childhood education is a form of education where children learn through play. It refers to preschool or infant/children educational programs up to the age of eight.

Early childhood classroom can therefore be defined as any classroom setting established to provide educational service to children below the age of eight. It is a section of the school where trained teachers are provided to interact with children by guiding them towards their first learning experiences. An early childhood classroom is usually stocked with devices both technological and non-technological to simplify and make interesting the process of teaching and learning in an early childhood education centre.

Technological Devices in Early Childhood Classrooms

There are arguments among educational stakeholders on the need to introduce pupils in early childhood classrooms to modern technological devices. This is as a result of the physical and psychological effects that these devices may have on the development of these pupils. However, this does not imply that technological devices suitable for their age should not be provided in early childhood classroom. This can be done with some level of supervision as well as safety plan in place so as to derive maximally the benefits of exposing these pupils to these technological devices at early age. Encyclopedia on Early Childhood Development (2016:3) revealed that "even the youngest children have access to these media with 83% of children aged 6 months to 6 years using screens every day for recreation, school work or reading". This is important for the intellectual advancement of the child as well as the development of the society.

Children in early childhood classrooms need to be exposed to the right technological devices at their age as this contributes to their social and intellectually development. It is therefore important for teachers and school administrators to ensure that early childhood classrooms are equipped with the right technological devices for the age of these pupils. In addition to this, there should be strict compliance to technological regulations that are established to protect these pupils from technological hazards. House (2012) pointed out that the essence of doing this is to avoid overloading the senses of these children. Educational stakeholders therefore need to carefully plan when and where pupils access technological devices in early childhood classrooms. Pupils in early childhood classrooms require some level of cognitive and psycho-motive development before they are being exposed to the use of technological devices. In fact, Encyclopedia on Early Childhood Development (2016) revealed that pupils should be allowed to exceed the two years before they are being exposed to technological. This is because this age marks a critical developmental point in the life of the child and as such early childhood education administrators must put all of these factors in place while exposing pupils to technology at this age.

Regulations on the Use of Technology in Early Childhood Classrooms

Despite the importance of exposing children to technological devices at an early age for sustainable national development, there are regulations that need to be adhered to by early childhood education center operators. These regulations are not limited to the following:

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Co-Learning: Children in early childhood classroom definitely require some level of interaction and guidance in the course of learning how to use technological devices. When this is done, it does not only protect the child from technological hazards but also helps the child to benefit maximally from the devices at his or her disposal. Pupils in early childhood classrooms may not understand the volume of information at their disposal except they are being guided on the use of these devices. In the same vein, co-learning with pupils also helps to protect them from the wrong usage of the devices available to them when left to learn on their own. It is therefore important for instructors to lead by example so as to carry all the pupils in the classroom along. Co-learning is therefore very vital rule that must be adhered to by early childhood education center instructors.

Clarity of Purpose: Cortez (2016) revealed that in the process of using technological devices in early childhood classrooms, pupils should be able to understand that these devices are used for social and intellectual development. It is often said that when purpose is not understood, abuse is inevitable. This statement also applies to early childhood pupils who may find it difficult to understand why they are being exposed to technological devices in their classroom if they are not initially oriented on the actual purpose. In most developed economies, children in early childhood schools are trained to understand that technological devices provided in the classroom are basically for educational purpose. Similarly, pupils are expected to be oriented on the purpose that each technological device is expected to serve so as to guide the minds of the children on how to apply these devices as well as avoid possible abuse.

Confidentiality of Information: In the process of teaching and learning, there are information that children are likely to share in the classroom and it is expected as a rule that this information must be kept confidential. The confidentiality of shared information is a rule guiding the use of technology in the classroom. Children may share information relating to their health status, social life as well as other vital information and it is expected that the teacher should be able to manage this information in order to avoid abuse. Similarly, the teachers as well as other classroom users must develop the habit of protecting the information shared in the classroom as this can go a long way to affect the interpersonal relationship existing among children.

Installation of Safety Measures: There is no doubt that children may be exposed to diverse form of hazards while making use of available technology for teaching and learning. Based on this fact, instructors in childhood education centres are expected to put safety measures in place to protect children from the danger of being exposed to technology. Children must be taught the importance of using protective equipment when necessary. In the same vein, the classroom or laboratory where these devises are being used must be well equipped with safety equipment against any form of technical hazard. Teachers as well as school administrators who wish to operate early childhood education centres must bear this in mind in order to avoid exposing children to the dangers of technological hazard.

Availability of Experts: As a rule, it is expected that every school is expected to have experts who will guide teachers as well as the children on how to use and maintain the technological devices provided in early childhood classrooms. Technological experts are needed to serve as instructors in the classroom and they are also needed to maintain the devices available in the school. The essence of making an expert available is to make the school as well as other stakeholders to benefit maximally from the devices provided in the classroom. Operating a childhood centre with modern technological devices is a capital intensive project and the need for experts to handle all of these devices cannot be overemphasized to maximize the benefits of having these technological devices in the classroom.

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Relevance of Technological Devices in Early Childhood Classrooms for National Development

Exposing children from an early age to technology has lifelong benefits which can contribute to sustainable national development. Despite the argument of different educational scholars on the appropriateness of exposing young children to technology at an early stage in life, Ogbonnaya (2010) believed that there is a relationship between early childhood education and future life performance of children. Hence, exposing these children to technological device will help in achieving the following which are important for national development:

Language Development: There are different pictorial as well as audio-visual technological devices that assist children in speech development in early childhood schools. Communication is an important component of national development as the information shared is vital for the growth and development of the society. When students are exposed to technological devices at an early age, it assists in their speech development which makes it easy for these children to communicate and understand basic information. Exposing children to technology will therefore help them to communicate clearly and understand the best way of presenting their ideas among other people.

Social Interaction: Sandvik, Smordal and Osterud (2012) observed in their study that pupils who were exposed to the use of technological devices as a group developed the attitude of cooperating, sharing, and participating in group activities. Technology aids social interaction and this is an important component of working with others as a team. Social development is an important aspect of national development and children can develop their social abilities in no distant time if they are exposed to available technology which helps to build social groups. When students are taught using technological devices, they develop social skills which help in meaningful interaction within and outside the classroom. This is also important for building social relationships that can contribute to national development. In fact, Salisu and Bakar (2018) revealed that external abilities can be accessed using technology. Children who socialize using available technological devices can acquire relevant competencies for personal and group growth and development.

Problem Solving Skill: There are different technological devices that are equipped with programs for solving day-to-day problems. When students learn using these devises, they develop problem solving abilities which are needed for proffering solutions to problems confronting the human society. In most cases, technological tools are developed to solve problems affecting man and his society. Students who are exposed to these devices gain better understanding on how to use these devices sometimes beyond what they have been taught in the school. Learning with technology will enable children in early childhood schools to develop problem solving competencies that will be useful in solving future problems of the society which can hinder sustainable national development.

Numerical Ability: Early math abilities can be developed through exposure to technology (Kazakoff & Bers, 2012). In this present technological age, acquisition of numerical skills is a necessity for children of all ages. Children need to understand how to engage in simple arithmetic which is a crucial skill in today's business world. This advantage can be harnessed when students are engaged through technological devices. This will enable them to make business projections that will contribute to the development of the economy. Educational scholars have also pointed out that numerical skills are also vital for logical reasoning which is a necessity for children who are the future managers of the economy.

Creativity: There are varieties of technological devices that enable children to develop their creative abilities. When students can play around with technological devices in the classroom, they put their creative ability to work and develop ways of solving problems around their

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environment. Similarly, there are technological programmes which are also designed to assist students to become innovative. Exposing children to such devices will enable them to build their pragmatic and cognitive ability which will be useful for creating time tested solutions to problems in the society. This is important for securing the future of any society.

In summary, Grand-Clement (2017:5) opined that exposing children to technological devices will be useful in the following areas; digital literacy, lifelong learning, knowledge management, critical judgment, soft skills, self-directed learning, media literacy, technical skills, analytical skill, personal resilience, agile development and team work". This will help in proffering solutions to some of the problems affecting the society and contributing to the developmental indices of the nation.

Challenges in the Utilization of Technology in Early Childhood Classrooms

There are diverse challenges encountered in the process of incorporating technology into early childhood classrooms. These challenges include the following:

Inadequate Technological Devices: It is almost impossible to acquire technological skills without exposing students to technological devices which will be needed for practical demonstration of what they have learnt. In their study, Gray, Thomas and Lewis (2010) pointed out that there is an average of five students to one computer in most schools. This appears to be among the best ratio so far documented in the study area. There are many more unpleasant examples where students take lessons in technology related areas with no practical demonstration of the new knowledge being taught. The shortage of technological devices is therefore one of the pronounced challenges in early childhood classrooms.

Teacher Incompetence: Children in early childhood classrooms can benefit from the little technological devices available in the classroom if there are competent teachers who will help educate them on how to use these devices. Some of the teachers employed to manage early childhood classrooms have little or no knowledge on the use of technological devices for teaching and learning. In related cases, these teachers find it difficult to transmit this little knowledge to the pupils. Children in early childhood education centres are therefore allowed to pass through the system without gaining adequate knowledge on how to use available technological devices available in the classroom. There are situations where these devices are left to rot because of the absence of experts or incompetence of the teacher. This is a challenge that hinders the technological development of students for sustainable development.

Lack of Auxiliary Support: Teaching and learning of technology related lessons in early childhood classrooms cannot be effective without the availability of support staff and other stakeholders. Since the teacher alone cannot manage all the students in the classroom, there is need for the provision of support staff who will assist the teacher to deliver quality lessons that will benefit the pupils. In addition to this, there is also need for technical and resource support from other stakeholders which will assist the school achieve her technological goals. The teacher alone cannot successfully deliver lessons in technology related areas to the understanding of all pupils. Auxiliary support is therefore required from parent, teachers, Non-Governmental Organizations among others. This support however in most cases are unavailable making it difficult for pupils in early childhood classrooms to enjoy a robust technology related lessons in school.

Resistance to Change: Another major challenge making it difficult for early childhood classrooms to become technologically inclined is the attitude of the members of the public to change. It is often said that change is not an easy task and the inability to embrace change limits the prospects of building a technology driven society. The attitude of parents, guardians, teachers, pupils and other school stakeholders makes it difficult for some early childhood education schools to move from a traditional

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classroom system to one that is driven by modern day technological devices. Parents sometimes fail to provide support for their children to procure technological devices needed for learning, teachers sometime fail to use these devices even when they are available in the classroom, school administrators fail to procure technological devices because they are capital intensive etc. The satisfaction of these stakeholders with the traditional teaching and learning resources hinders the acceptance of technology in early childhood classrooms. The need for educational stakeholders to embrace modern technological devices in early childhood classroom is therefore a necessity that cannot be over-emphasized. However, most of these stakeholders have shown their resistance to adjust to the technological age and this has limited the prospects of sustainable national development.

Physical Factors: There are diverse physical factors that pose a challenge to the use of technological devices in early childhood education centres. One of these physical barriers is the distance between the location of some of these technological devices and the classroom where they are needed for teaching and learning activities. The physical plan of the school can hinder children's access to available technological devices for teaching and learning. Courville (2011) agreed that such as distance can prevent school children from accessing available devices which is needed for their technical development. In addition to the above, the physical development of the child can also hinder their use of technological devices in the classroom. Children with physical defects sometimes find it difficult to manipulate devices available for learning. When a child has any form of disability, it poses a challenge to their adoption of technology for learning. This physical barrier limits the prospect of pupils embracing the use of technology for learning. School administrators operating early childhood education therefore need to make conscious effort to plan the school setting in other to improve access to available technology and those with physical barrier need to be provided with support services to make use of these devices. However, this plan is not available in most cases hindering pupil's technological development for sustainable national development.

Way Forward

There are measures that need to be put in place by educational stakeholders to equip children in early childhood education centres with technological competence needed for sustainable national development. These measures include:

Teachers Involvement: The need for teachers to be involved in the development of technological devices for children in early childhood education centres is an issue of growing concern among educational stakeholders. Since teachers understand the need to children under their control, it is equally important for them to be involved in the process of developing and selecting technological devises that will be used for teaching and learning. The teachers will be able to bring in their expertise and close knowledge of the child to decide which device will fit the differences that exist in the classroom. The teacher will also be able to advice the developers of these devices on tools that will not pose a threat to the development of the child. This will help in the grooming of students who will contribute to the sustainable development of the nation in the future.

Infrastructural Development: if progress must be made in the introduction of technology into early childhood education classrooms, then there is need for investment in technology dependent infrastructure. Chukwbikem (2013:165) pointed out that in the process of embracing technology in the classroom, the infrastructure provided must play the following roles:

1. Establish and enforce programme and child outcome standards
2. Create and sustain a system to support elements of quality

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3. Ensure quality through mechanisms for accountability and continuous quality improvement.

There are varieties of infrastructure needed to support the introduction of technology in early childhood classroom. This includes the provision of a technology laboratory, installation of internet facilities among others. The government as well as school administrators therefore need to collaborate to provide these facilities within and around early childhood education centres so as to give these children unhindered access to technology driven education within and outside the classroom.

Curriculum Reform: The curriculum for teaching children in early childhood education centres also need to be reviewed to shift from the traditional approach to a technology driven approach. If pupils in early childhood education must grow to contribute to the sustainable development of the nation, there is need for children in these schools to be exposed to technological devices at an early age. The curriculum therefore needs to address the issue of when, how and what kind of technological devices that children need to be exposed to so as to make them technologically inclined for national development in the future.

Technological Mentoring: Mentoring also plays a major role in the process of grooming children who will embrace technology for national development. Children in these schools need to be exposed to technological experts who will help model these children into lovers of technology for national development. Experts in the field of technology need to be brought into the school from time to time to help these children acquire firsthand information that will enable them make meaningful contribution to the development of the society. Grand-Clement (2017) identified absence of family support and mentoring as a challenge to children embracing technology. When this is addressed, children in early childhood education centres can be guided towards becoming technological experts in the future.

Parental Involvement: Parents also have a major role to play in assisting their children to embrace technology for national development. Moral, financial and technical support must be provided for these children when necessary. Children are often motivated by the involvement of their parents in their educational pursuit. When parents develop a sense of belonging and assist their children in their technological growth, it can help these children to embrace technology within a shorter time. The involvement of parents will also enable these children to create a niche where they can contribute to the development of their society based on the support received from their parents.

The Centre for Child Well-Being as cited in Sapungan and Sapungan (2014:43) stated that "parental involvement in their children's
learning not only improves a child's morale, attitude, and academic achievement across all subject areas, but it also promotes better behavior and social adjustment". Children who receive support from their parents stand a better chance of succeeding academically and contributing to nation building.

Conclusion

Lofsten (2014) asserted that embracing technology is more important today than any time in the past. This is because of the rapid changes in the society as well as the growing competition across society. It is therefore important for all hands to be on deck among all educational stakeholders to ensure the management of available technological devices to equip children in early childhood education centres. This will help to prepare these children for the developmental needs of the society in the future.

Therefore, while the government develops the right policy framework and ensure a review of the curriculum, early childhood centre operators need to ensure that the right devices are procured. Teachers on the other hand need to acquire the needed technical competence. Parents need to provide the right moral and

material resources while the interest of the children must also be developed. When this is done, it will usher the nation towards the path of sustainable development by taking advantage of the increasing innovations in the area of information and communication technology.

Suggestions and Way Forward:

The following suggestions were made in line with the findings of the literature reviewed:

1. There is need for parents to collaborate with the government as well as early childhood centre operators in the provision and utilization of technological devices in early childhood classrooms. This will help to ensure that children at this level of education are exposed to safe learning both within and outside the classroom.
2. Teachers assigned to early childhood classroom need to be exposed to regular training in the use of technological devices. This will not only guarantee the safety of the children but also ensure that students are exposed to the right knowledge which will contribute to the sustainable development of the nation.
3. Early childhood centre operators should be supervised from time to time by the government to ensure that the right learning resources are provided and that teachers and school operators comply with government regulations for meaningful teaching and learning in these schools.

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