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Inculcating Digital Technology in the Classroom for Lifelong Learning

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Abstract- ***The need of the 21st century and changes as witnessed in the society and world at large has threatened the educational system and method of delivery. Technology now has become an integral part of human life. The society now depends on technology in doing many things like transport, business and education inclusive. So the demand and need for technology and its advancement keep increasing with each new day in line with the needs and aspirations of the people The inculcation of technology in the classroom is apt now more than ever given the recent occurrence and other changes that have been witnessed and may be witnessed. This approach not only enhances academic achievement but also equips student needs. Technology so far has recorded some improvement in education and this has resulted in greater demand on educators to incorporate digital tools in their practice to support more flexible, and relevant learning opportunities. However digital technology cannot be assessed without proper knowledge and skills, hence the need for it to be integrated in the educational programme and emphasis laid on the acquisition of necessary digital literacy skills that will enhance the effective utilization of these educational technologies in the classroom. This paper thus looked at the various concepts that run as inculcating, digital technology, classroom and life-long learning. Prospects, agents and challenges envisaged in the innovation were discussed.***

Index Terms- ***Inculcating, Digital Technology, Classroom, Lifelong Learning***

I. INTRODUCTION

- Inculcate

Inculcate derives from the past participle of the Latin verb inculcare, meaning "to tread on." In Latin, "inculcare" possesses both literal and figurative meanings, referring to either the act of walking over something or to that of impressing something upon the mind, often by way of steady repetition. It is a continuous process whereby the action is actively performed to achieve the goal set.

- Digital Technology

Digital technology is electronic tools, systems, devices and resources that generate, store or process data. It can also be described as a sort of technology that is opposed to analogue technology. Digital technology in the classroom is not restricted to hardware but also software programs. However, digital technology in the classroom can "be taken to mean digital processing systems that encourage active learning, knowledge construction, inquiry, and exploration on the part of the learners, and which allow for remote communication as well as data sharing to take place between teachers and/or learners in different physical classroom locations" (Digital Learning Network, 2017). Other terms associated to classroom technologies according to Afreen, (2014). are:

a. Bring your own device (BYOD): Here learners bring their own technology into the classroom for use as part of the learning activity e.g mobile phones.
b. E-portfolios: Learners and teachers create an electronic catalogue of work that tracks their learning journey. This is usually online and often uses multimedia files e.g a student portfolio of artwork is presented online through an e-portfolio. This includes scans of their sketches, photographs of displays and visits to galleries, written reflections, and narrated videos of the artist (learner) at work.
c. Flipped classroom: Learners discover new content before the lesson from online videos or resources and then apply this knowledge in more

personalized work in the classroom e.g. learners watch a video at home about how sedimentary rocks are transformed into metamorphic rocks. In class they work in groups to collaboratively create a diagram explaining this process of transformation and an audio logbook.

d. Personal Learning Network (PLN): PLN is a group of people that are connected with to enhance learning and take charge of own professional development. It is a way of describing the group of people that one connected with to learn their ideals, questions and reflections. The aim of such a network is to facilitate and exchange of ideas that supports learning links. Online interest groups for example on Twitter and/or online and face-to-face courses.
e. Virtual Learning Environment (VLE): VLE is an e-learning education system that is web-based, but modeled on conventional face-to-face education. It provides access to courses, course content, assessments, homework, links to external resources etc e.g. Moodle. (Digital literacy 2012).

Blackwell (2014) stated that research findings have some evidence of increased teacher efficiency as a result of using tablet, computers and associated software and application. Also Burden et al (2012) found out in his research that the use of iPads encouraged teachers to explore alternative activities and forms of assessment for learning. According Blackwell (2014), teachers generally reported that iPads required virtual training for them to be used effectively, to allow them develop and extend homework activities, and enable them provide better feedback to learners about their learning. The initiative was described by stakeholders as 'the most easily accepted, successful and problem-free (digital) initiative they had ever witnessed' because of the low levels of resistance to their using. (Burden, 2012) Digital classroom application and process include web-based learning, computer-based learning, virtual classroom opportunities and digital collaboration (Ghavifekr, & Rosdy, 2015). Content of instruction is delivered via the internet, internet/extranet, audio or video tape, sabelike, Television, and C.D rom. Others are CBT (Computer Based Training), CBT (internet-based training) and WBT (web-based training). These will enable students to develop and imbibe lifelong learning. In classroom today, many teachers do not know how to use available devices within their environment to teach. Instead of exposing their illiterate over technology, they prefer using the normal method of teaching. The world is digital in operation; therefore, teachers need to be trained technologically for lifelong learning.

- Lifelong Learning

The need to imbibe lifelong learning in students can never be over stated. Lifelong learning has been described as a process that includes people learning in different contexts *(O'Grady, 2013)*. According to commission of the European communities (2001), lifelong learning is defined as "all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective". This assertion agrees with Dewey (1938) who stated that inculcating the desire to keep learning is a key attitude that needs to be developed in people. The implication of this to schools is to inculcate in students self-directed learning. Thus, with the increasing ownership of digital devices among students and numerous information and resources in the internet, there is need for educators to prepare students not only to enter workforce but also to become informed and active digital citizens who will embrace lifelong learning. Educators should be responsible to inculcate in students responsible and ethical use of the internet. Therefore, it is important not only to use internet resources but also make their own inputs in order to leave positive digital footprints.

- Classroom

This refers to a room where classes take place. A classroom is the place where teaching takes place; the space within a structure or virtual environment where learning takes place.
A classroom or schoolroom is a learning space in which both children and adults learn (Nicoleta, 2021). Classrooms are found in educational institutions of all kinds, ranging from preschools to universities, and may also be found in other places where education or training is provided, such as corporations and religious and humanitarian organizations. The classroom provides

a space where learning can take place uninterrupted by outside distractions.

- Digital technology in the classroom

Digital technology in the classroom is not only an equipment that will occupy space in the conventional classroom setting, but the use of technology has expanded the space of classroom activity to include teaching and learning outside an enclosed space, for instance internet, e-mail, zoom, whatsapp and others have allowed for remote communication as well as data sharing between teacher and learner in different classroom locations. According to Staley (2014), not all instruction occurs within the classroom, engagement with students also occurs outside the classroom, as during office hours. Instructional method, instructional materials and mode of assessment must be technologically based. Students will be encouraged to bring the devices into the class. According to Ghavifekr, & Rosdy, (2015), this is to enable students use technology in dealing with real life problems, incorporate them in defining different aspects of the problem. According to the author, teacher only used to demonstrate the concepts and the students can work with their computers. The learning environment must be cooperative in such a way that will enable interactions and free exchange of ideas.

Ways in which technology can be used in the class include:

1. The use of white-board to design and deliver lessons
2. Students should maintain blogs, wikis, web pages related to their learning.
3. Use e-mail/video chat exchanges with students
4. By setting up a blog site/facebook page and post-weekly discussion questions for students to respond to.
5. Video cameras can be used to dramatize stories, experiments and expose students to video editing software to create video production
6. Use web browsers, search engines, e-mail test, wiki, blog, power-point, video creation/editing software etc to showcase learning.

Needs to inculcate digital technology in the classroom

Irrespective of the weaknesses of digital technology in the classroom, the importance outweighs the weaknesses. Harrell, and Bynum, (2015) stresses the reasons for the incorporation of digital technologies in education. They are broadly categorized into three and they include: to support learning and the achievement of successful learning outcome; to develop twenty-first century skills as part of preparing students for the workplace; and to become responsible digital citizens and lifelong learners.

- Supportive Learning

Pedro (2018) argue that digital technology supports learning by:

1. Enabling the continuity of learning outside the class time through the use of mobile devices to access information and resources on the internet or through sustained communication via learning management systems and other virtual learning communities on the internet.
2. Promoting cognitive development and increased students' motivation to learn.
3. Contextualizing learning through the provision of highly interactive resources that embrace real life experiences to engage students while learning e.g. frequent formative feedback (use of audience response system for frequent tracking of students' learning).
4. Enabling research through the collection and display of data.
5. Providing means for communication and collaboration through learning systems and blogs, wikis for assigned group tasks or interacting with the wider community to obtain support during learning.
6. Providing means to facilitate students' demonstration of what they have learned.

- Developing twenty-first century skills

There are recognizable changes in the society and the integration of technological development in all spheres of life. The impact of technology on the corporate world is evident in both the administration, production, streamlined and reduced amount of time required. Wiel (2002) is of the view that there is a move from the hierarchical structure and routine skills of the industrial era to a focus on teamwork. This is because it is often cross functional, geographically displaced and frequently stimulates

creativity and innovation, enhances communication and knowledge sharing. Hence, the kind of skill required from the employees in this twenty-first century is higher order thinking skills, (Brookhart, 2010).

In this vein, the emphasis of twenty-first century skills is on students' ability to apply knowledge and skills they have acquired to authentic problem-solving situation. These skills include communication, collaboration, problem-solving, critical and creative thinking skills as well as those needed to make use of the rapidly changing technologies which is digital literacy (Walser, 2008). Digital literacy involves the understanding of digital technologies and its use for learning as well as in the workplace. Therefore, the ability to use digital technologies to solve problems, innovate, collaborate and communicate responsibility in the workplace is a central tenet of twenty-first century skills. Hence, digital technologies can empower teachers and learners to foster development of twenty-first century skills.

- Developing Digital Citizenship

Digital Citizenship is a concept which helps us understand what all technology users should know to use technology appropriately and responsibly. According to Ribble and Bailey (2014), Digital citizenship is the act of engaging in appropriate and responsible behaviour when using technology. It encompasses digital literacy, ethics, etiquette, online safety, norms, rights, culture and more. A digital citizen is one who knows what is right and wrong, exhibits intelligent technology behaviour, and makes good choices when using technology, (Miller, 2017).

Today, billions of people all over the planet interact using various technologies. This interaction has created a digital society that affords its citizens opportunities for education, employment, entertainment, and social interaction. As in any society, it is expected that digital citizens act in a certain way according to accepted norms, rules, and laws. Most of today's students are entirely comfortable with technology, but are they using it appropriately? Do they understand their roles and responsibilities in digital society? There is need to have background knowledge on digital technology and well-trained technicians around in developing digital citizenship.

- Elements of Digital Citizenship

1. Balance: Balance refers to helping kids use their time online in healthy and reasonable ways.
2. Safety and Privacy: Students may know how to find information online, but online safety is not always intuitive for kids. Teach elementary students about online Safety and Privacy by reminding them that a parent, a teacher, or other trusted adult should always be present while they are on the internet.
3. Respect: This means teaching students how to use their words mindfully both in the physical world and in their digital communication. Explain to your students that once they post something online, it is often permanent. When they are writing to a friend or family member, they need to think about whether the information they are sharing is appropriate and polite before hitting 'Send'.
4. Connecting: Connecting, in terms of digital citizenship, makes students aware of ways they can engage with their loved ones through phones, tablets, and other digital resources..
5. Learning: Young children are curious by nature. If we can help them view the internet as an educational resource for learning, they can make the most out of their time online. When a student shows interest in a topic you don't know much about, show them how to find answers online.
6. Critical Thinking: And speaking of Wikipedia, it is important for students to think critically about what they are finding online. There may be a ton of information on the web, but not all of it is accurate. Critical Thinking involves teaching students to evaluate what they see online and determine whether they can trust it or not.

It is of the ultimate important to consider the elements of digital citizenship in inculcating digital technology in the classroom for lifelong learning because not everything in the internet is good and trusted. Some of them could mislead some learnings while is important to some as it concerns levels of development and exposure in education. Some learners will be carried aware by what they see online

which may be a barrier in learning activities at that level which may affect lifelong learning.

- Principles of Digital Citizenship Excerpted by Ribble (2014)

a. Digital Access: Digital Access involves ensuring that all students, regardless of background, enjoy equal opportunity to utilize digital electronic resources.
b. Digital Commerce: Digital commerce entails individuals purchasing or selling goods and services online.
c. Digital Communication: Digital Communication is the act of people utilizing digital devices or networks - be their e-mail, instant messaging (I.M.), Text messaging, blogs, or Wiki, just to name a few means - to communicate with each other.
d. Digital Literacy: Digital Literacy involves educating people to utilize digital technology, and taking advantage of digital technology creates complications for teachers for several reasons. Teachers not only have problems due to the lack of time to educate themselves in utilizing digital technology, but students are often far more proficient with it due to having lived in a world where it was always available.
e. Digital Etiquette (Netiquette): Digital etiquette, or netiquette, involves responsible digital behavior and appropriate use of digital devices. Many aspects of digital etiquette tie into online safety, and each website will spell out rules by which users of the website are expected to follow to ensure appropriate digital etiquette and personal security.
f. Digital Law: Digital Law focuses on ensuring the appropriate downloading and sharing of information from digital devices or sources, and it ties into the issues of copyright, plagiarism, and fair use.
g. Digital Rights and Responsibilities: Digital rights and responsibilities involve digital users enjoying the right to access, download, post, and utilize digital information in exchange for exercising ethical behavior and decorum in their conduct in digital space. Users of digital information have the right to access and post information on websites without fear of vandalism or threats while utilizing responsible behavior in using technology at appropriate times for appropriate purposes.
h. Digital Health and Wellness: Digital health and wellness entail digital users sustaining their physical health while avoiding addiction to online or digital sources. While most of the focus on digital safety involves online safety in cyberspace, use of computers and other devices providing online digital access leads to physical problems. This is because setting actions are performed online and people listen to them and practice them within their environment which may or may not favour them. Many people are suffering today as a result of digital technology, what they see or hear online they do without knowing that all glitters are not gold.
i. Digital Security and Protection: While digital and online sources provide all manner of opportunities to access materials from seemingly secure locations, users often overlook the fact that they can expose themselves to all manner of risks due to messages which they send being permanently preserved in cyberspace, even if they subsequently delete it.

In developing digital citizenship, both elements and principles of digital citizenship are necessary because not all information online is true and trusted. Frauds are everywhere in internet and fake material are being provided online. One need to be guided and trained on how to source for true information and download the real application and other resources. Some people have what it takes to move to the next level technologically but how to use it is a problem which needs a little training by experts. With the help of these elements and principles of digital citizenship, students will know their limitation of technological usage and how to use it without abusing it and mislead.

Watanabe Crockett, (2017) compounded this chart that shows a good digital citizenship

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Agents for Inculcating Digital Technology in the Classroom

1. Parents: Parents are the first teachers to all the learners. Children today are digital native, growing up in an age where social media and online communication is the norm (Suzie and Palfrey 2016). In this digital era, children are more interested in digital technology than any other thing, so parents should help in inculcating the digital technology and make it part of them positively and be able to control them to learn and acquire knowledge and skills through it. Suzie and Palfrey pointed out that if parents abdicate in this area and don't engage with young people on issues related to their technology use, then those parents are leaving their kids in a tough spot. Being scared of digital technology is not the solution but understanding it and making it available in the house for the children to use especially for learning purposes and they can be moderated and monitored. It is expected that parents should help their children to participate in online learning by providing the gadgets and network needed at the appropriate time.
2. Government: Another essential agent of digital technology is government because without the help of government, it will be very costly to access and maintain digital technology, even to train the experts who will manage the technical aspect will be very difficult. Government has to encourage digital technology in the classroom by providing the basic material resources.Some developed countries offer free data to all the citizens and people living in the country; through it teaching and learning are encouraged.
3. Network providers: without network provider being in support and part of digital technology in the classroom, it would not be effective and efficient. If network is not strong, teaching-learning will not take place online. So network is one of the key agents in inculcating digital technology in the classroom for life-long learning. For instance, network providers can decide not to be available for a day intentionally or unintentionally.
4. Ministry of education: Ministry of education should endeavour to include/supervise digital technology in curriculum and also make it compulsory for all the students. There should be technology laboratories in every school where both teachers and students will have access to devices as well as training the experts for life-long learning.
5. School management. Schooling provides essential learning and when schools close, children and youths are deprived opportunities for growth and development. If school management is not interested in digital technology, it will not function in the classroom because schools are hubs of social activity and human interaction. School management should provide resource room where students should have access to some technological materials.
6. Teachers: It is the duty of teachers to carry out the instructions on how to make use of the technology properly and instruct the learners. Teachers are instructors of digital technology as it concerns learning. In this aspect, teachers need training before applying any gadget, application, software and hardware in the classroom otherwise it will be a bond of confusion to the learners. According to Timor (2014), teachers are expected to become technologically oriented and responsible not only for their teaching but also for their students' learning. They have to cater for special needs of individual students in heterogeneous classes, and create a student-centered learning environment which strives for excellence, and offers opportunities for enquiry and active learning. Teachers need to meet the standards of the curriculum while enhancing students' creativity, curiosity and motivation. They need to ensure a safe climate in their classrooms and maintain relationships with students, parents and staff.

- Challenges to the Use of Digital Technology in the Classroom

Despite the importance of technology in increasing student achievement, motivation and development of skills, yet technology cannot be said to be fully used in education system and the classroom. Research finding on impact of technology (Punia, 2018) indicated that technology is yet to transform or revolutionalize teaching and learning. Technology has only been able to support existing learning process and their associated administration. Other research findings highlighted that the use of technology in the classroom was generally infrequent and often isolated; the use of technology by educators was basically for administrative purpose; Daly and Pachler (2009) maintained that despite the considerable resources being provided to support the use of technology in school, its impact is still low. Hence, some of the barriers to the use of technologies in the classroom include:

1. Lack of resources to provide the necessary digital and new technologies needed in the classroom.
2. Time consumption: Because of connection problems, downloading issues, policing software and other difficulties can cause road blocks when implementing a lesson in the technology-based classroom, teachers sometimes shy away from using it simply because of lack of time. With all the demands on students, the amount of time spent in the classroom is more and more valuable.
3. Lack of proper institutional leadership and technical support
4. Inadequate professional development
5. Inability to prepare technology integrated lesson when some of the digital devices are available.
6. Lack of confidence and skills in using technology by the teachers
7. Lack of belief in and negative attitude towards using technology in teaching
8. Lack of knowledge of pedagogically sound method of incorporating technology in the curriculum by the teachers.
9. Cost: New digital technologies are quite expensive to acquire. Then when it comes to developing countries, some areas have no power and internet, so it becomes very difficult to use educational technology. This creates a big gap between the digital haves and have not.
10. Need for Training Teacher: To integrate digital educational technology in classrooms, teachers will have to be trained on how it works. Most of them have less time to learn new technologies. As for the students, they will find it difficult to learn these technologies without a guidance from their teachers.

These identified obstacles are still persisting issues for educators to embrace technology in teaching and students' learning.

- Advantages of Digital Technology in the Classroom

The significance or importance of digital technologies in the classroom cannot be over emphasized. Johnson et al (2016), outlined some of the benefits of digital technology in the classroom. They are:

1. Easy access to educational materials: Teachers can use new technology tools like Artificial Intelligence (AI), Robotic Process Automation (RPA) to answer student's questions, manage course materials and track student participation. Also students can access Pizza on their computers or portable gadgets to access course work assigned to them by their teacher. This saves time on both sides.
2. Digital technology motivates students: The use of computers and other new technological gadgets in class makes students like what they learn. These students are familiar with these gadgets, because they use them in their daily life for entertainment, so integrating them in the classroom will make learning fun. As opposed to getting instructions from a teacher directly, students will prefer getting these instructions via the computer, a teacher can be emotional which can irritate the students and stop them from learning yet a computer is just a gadget, the students will be in control and they will take information on the computer more seriously.
3. Increases student participation: Digital technology for education like portable laptops and internet allow students to learn and participate while out of the classroom. Sometimes learning from one place can be boring, so technology makes it flexible. A student can simply access course

materials or get involved in a peer discussion using an iPad or a Galaxy Tablet

4. Improves Students' Writing Skills: Computer applications like word processors make it easy to write and edit notes. These applications also have inbuilt dictionaries which will help in improving a students' vocabulary. Also students can decide to publish their works on blogs where other students can access them. This is more interesting compared to taking notes in the book with a pen.
5. Subjects are made easier to learn: It is very easy to learn new subjects using a computer or internet. Many computer applications have been created to make learning of new subjects easier. Students can easily solve math equations through online math games and puzzles. Students can easily learn new languages using free online language translators.
6. Encourages personalized learning plans: Students are encouraged to use various multimedia technological tools to demonstrate themselves in the classroom. This way, students get more involved in the process and they learn better.

- Disadvantages of Digital Technologies in the Classroom

Digital technologies in the classroom have their own pitfalls. Some of them are:

a. Access to inappropriate content: The biggest concern when it comes to the use of technology in schools is how easy pornographic, violent, and other inappropriate materials can be accessed and viewed. This could cause big problems if the material is shared with other students while in the classroom.
b. The cyber-bullying trap: Cyber-bullying is the use of cell phones, instant messaging, e-mails, chat rooms or social networking sites to harass, threaten or intimidate others. Giving students access to anonymous accounts and endless contact avenues can sometimes lead to trouble. Cyber bullying has become a real problem among young people today. This harassment has no end, which extends also to the classroom. There is also no way to monitor or discipline students who are involved.
c. Upkeep and maintenance expenses: Once technology is purchased for a school, the cost of upkeep and maintenance can be too great for the school to maintain. Outdated software and hardware components can be incompatible with available programs. Also, the cost of repairing broken equipment may be too expensive for school budgets. In order for a school to successfully implement technology, there must be a rolling replacement or updating plan in place to keep technology current and useful.
d. A major distraction: Attentiveness drops drastically in the classroom when students have their cell phones or other technologies out. The focus shifts from their teacher and education to whatever they are looking at, playing, or doing on their phones.
e. Lack of support: While technology can be a great addition to the classroom, it also can be a source of frustration for both the teacher and the student. Unless the teacher is well trained in technology and can support the hardware in the classroom, a technology expert will be needed to troubleshoot problems. If schools cannot support the purchased technology, it essentially renders it useless in times of crisis or disrepair. Additionally, technology often needs frequent maintenance to keep it in good condition for use.
f. Inevitable cheating: While having an easy access to information may seem like a great thing, it can become a real problem in a test taking environment. Cell phones have made cheating easier than ever. You no longer have to figure out how to write all of the answers down, you can just look them up.

II. CONCLUSION

In conclusion, there is no going back in infusing digital technology in the education system and classroom. This paper succinctly explored the prospects in integrating digital technology in the classroom and the barriers. Therefore educators, administrators and the policy makers and students alike should ensure the use of these technologies and provide them where not available in order to take teaching and learning process to a higher level. Digital literacy is sequel to global citizenship.

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