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Technology's Role in the Classroom and Its Implication on Students' Learning

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ABSTRACT

Recently, technology is visibly influencing every field of human endeavours, including educational sector. Schools are incorporating digital tools into classroom teaching and learning process to keep abreast with the technological advancement as well as prepare students for the rapid changes that comes with the digital era. This paper presents the various roles played by technology in the contemporary classroom setting and the effect on students' learning. From our findings, technology plays a great number of roles in educational system. It brings about better understanding, makes the class more engaging, allows the use of combined teaching methods etc. We observed that the incorporation of technology in classroom has greatly improved students' learning, however, it can also mar students' learning if not well managed and utilized.

Keywords: Education, technology, classroom, learning, digital tools

INTRODUCTION

Education brings about sustainable development including social well-being. As a result, many measures are put in place to reform educational sector and technology is one the major driving forces behind this educational reforms. The integration of digital learning tools into classroom is greatly influencing classroom learning. Technologies such as Internet of Things (IoT) is presently being applied in educational sector in order to spice up learning and create an exceptional learning experience for the young people (Keengwe, M. and Bhargava, 2014, Dreimane, R. and Upenieks, 2022, Rogers, P.L. 2000).

Educational system has significantly changed over the past decade such that mobile technology has become the order of the day (Fidishun, n.d.; McWhirter & Shealy, 2020). while some researchers are of the opinion that the integration of technological impedes students learning (Naomi, 2015), others believe it can enhance learning and offer new and extraordinary experiences that could not be obtained without technology (Lloyd, 2000; Miller, 2014).

Technology enhances and diversifies students' learning experience in several ways. Technological tools like social media, virtual reality, and video contents can be used to facilitate student-teacher relationship, improve student critical skills, and promote class engagement (Lucas & Gajjar, 2020). Various programs, websites and educational platforms such as Microsoft Teams, Google Drive, Blackboard, Google Classroom etc. currently available are also helpful in improving communication between students and instructors.

Schools make use of digital tools in informing student's progress and learning outcomes and optimizing teaching and learning processes. Incorporating technologies in educational sector helps to create an engaging

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learning platform for inspiring and motivating students. A lot of researchers have shown relationship between technologies and student engagement, motivation, and positive learning outcomes (Fokides & Kefallinou, 2020; Heindl & Nader, 2018; Kotsari & Smyrnaiou, 2017; Moyer et al., 2018). This has to do with keeping classrooms open for exploration and connected learning beyond the school boundaries and integrating technology into the school curriculum to ensure flexible and divergent content delivery.

The use of projectors, computer systems, and other digital tools in the classroom tends to make learning enticing and entertaining for students. Learning process is often made more dynamic and engaging by incorporating technology-based tasks, oral presentation and group participation in classroom. The group participation can be extended beyond oral communication (Akbaba-Altun S., 2006 and Mikre, F., 2011).

In spite of the numerous benefits associated with the introduction and incorporation of technology into classroom learning, there are still some challenges that come with it (Brinkerhoff, 2006). some of these challenges include digital divide, financial constraints, lack of adequate infrastructure etc. However, it is pertinent to note that the benefits of technology-based education outweigh the challenges.

REVIEW OF RELATED WORKS

Integrating technological tools, into classroom practice can boost digital literacy and learning across different subjects, promote twenty-first century skills and create cultural awareness.

Carreon (2018) carried out a research on Facebook as an online teaching platform that conventional classroom learning. The research was aimed at ascertaining how the use of Facebook for online discussion forum can affect learning. The research was carried out on the 7th year students in the Philippines. He created a private Facebook group for sharing and discussing a scope of learning materials and courses through multi-media, textual post and audio-video materials. From the findings, the students that participated in the private Facebook platform performed better academically compared to students that did not participate. The researcher therefor opines that Facebook improved students' learning as it allows students to determine their personal time, pace and place of learning.

Eubanks et al. (2018) conducted investigation on the effectiveness of incorporating Digital Story Telling into writing workshops. They studied 2nd year student of a Chinese primary school language class, engaged in a daily writing class. The researchers scaffolded the students' story writing process with conventional materials like papers and crayons before putting them in digital form using different iPad apps. The research objective was to ascertain whether the use of digital story telling affected the capability of student and their attitude towards story writing. From the findings, there was significant improvement in the students' engagement, motivation and ability to write Chinese. The research also recorded improved students' reading, speaking, reading, and listening skills.

Wilkes et al. (2020) highlighted the benefit of technology and instructors working together to promote language learning outcomes. Their research was aimed at determining whether technological tools could promote better English language and learning proficiency in early childhood education. The findings indicated that digital reading proficiency program was more effectual when combined with teacher's guidance. The researchers opined that some learning resources, provided by digital tools, are to be seen as additional learning materials rather than instructors' alternatives (Wilkes et al., 2020).

Madanipour and Cohrssen (2020) reviewed the importance of Augmented Reality in teaching practice and learning outcomes during pre-school period. They discovered eight research works that harmonized with their search criteria and came to a conclusion that using augmented reality can be beneficial to child learning outcomes in the field of drama, art, reading and learning of alphabets. Augmented Reality also promotes child engagement, resolution, attentiveness and creativeness. They also observed that augmented reality boosts excitement, motivation as well as social interactivity and involvement

Kotsari and Smyrnaiou (2017) investigated the use of technological tools and modelling software in improving inquiry-based learning. They focused their research on ascertaining how modelling software and technological

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tools such as science databases, multimedia and online collaboration websites can help learners create rational meanings on geometrical optics. During their investigation, the learners were kept in online collaboration and learning platform where simulated communication as well as different geometrical models and representations were used to create scientific meaning. The result shows that the use of modelling software and technological tools promotes participation and enhance positive learning outcomes (Kotsari & Smyrnaiou, 2017).

A research by Bradbury (2019) investigated the datafication process in early child leraning. this process basically used data as a built-in element of the learning environment, rooted in the teaching and learning process that informs and guides instruction in order to make continual changes to promote optimum learning outcomes. The aim of Bradbury's investigation is to examine how ongoing collection of data on phonics assessments enhance accurate student grouping according to levels of ability. The result showed that combining the data analysis and observations of teachers helps in systematic organization and making informed decision, thereby assisting instructors in meeting learners' needs and improving learning outcomes (Bradbury, 2019).

In another study, Buzhardt et al, (2020) explored how Data-driven decision making (DDDM) can help instructors in identifying and providing personalized guide to early learners that need extra learning and language support. The finding showed that progressive monitoring of data assists in early detection of underperforming pupils and this enables teachers and parents to provide the necessary assistance.

ROLES OF TECHNOLOGY IN CLASSROOM

Technology's roles in the classroom is evolving. Recently, technology has become a new means of encouraging and enabling students to outperform their usual strength. Technological innovation is rapidly growing over the past few decades and as a result, educational technology is becoming the order of the day in various institutions of learning. Integrating technology into the classroom learning can be beneficial in the following ways:

i. Enhances students' understanding: with introduction of technology, students currently have knowledge at their fingertips as they can access all learning resources needed to understand any topic or subject easily with basically few clicks. Often times, students are faced with challenging academic problems but with technology, such problems no longer pose serious challenged as students can easily look up for the solutions to such tasks through available search engines or request more explanation from their instructors through technological tools like e-mail and instant messengers. Also with the help of technology, students can explore new topics in order to increase their understanding of new and difficult concepts.

ii. Fosters students' Engagement: integrating technology into classroom can make great difference in students' learning. It enables the students to be fully involved and make meaningful contribution that will promote the learning process. Proper use of digital tools such as games, software and virtual reality helps teachers impact knowledge effectively and makes learning fun for students. Chat rooms and other similar applications can also be used to help students to engage with their instructors and other students with much ease without wasting time.

iii. Gives room for different learning methods: Technology-based teaching allows teachers to adopt any suitable method of learning including combined approach in order to meet students' educational need. The learning styles include lecturing, reading, illustrations, recording etc. Students can also study in their comfort zone through audiobooks, online videos, virtual interactive games and other learning resources. These online materials also helps teachers and students access up-to-date information and materials as they are always updated.

iv. Saves time: the teachers as well as students make benefit from technological education. Time saving is one of the most important benefit derived from integrating technology into classroom. Today, there are good number of application that help teachers take students' attendance. Such application enables teachers to multitask as they can engage in other class activities while attendance is going on. In addition, students' assignments and tests can be carried out faster online through the use of digital tools rather than using manual

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methods of pen and paper. Also, grading students' scores is easier and faster with the use of technology-based platforms that interpret test answers instantly on a large scale. Currently some apps have been designed to give teachers status reports, thus assisting them in viewing student's progress. These reports also highlight opportunities for improvement, allowing teachers to identify learning difficulties earlier in the school year. Technology not only makes grading more accessible for teachers, but it also helps students get the help and attention they require.

POSITIVE EFFECTS OF TECHNOLOGY ON STUDENTS' LEARNING

i. Enhances Students' Engagement: Technology has a very huge impact in teaching and learning. It enables instructors teach courses more interactively and creatively thereby improving students' participation. With all the technological innovation including virtual reality, it has become very easier for teachers to plan their courses.

ii. Equips Students for better Future: Everything is currently going digital and as such it is of paramount important that technology is integrated into students' learning platform. Application of technological tools in teaching will keep students abreast of common programs and technical knowledge that may be needed in their future careers. Also teachers often use technology to prepare students for the future as it has a very big role to play in their lives especially now that the use of computers and the internet is an integral part of every profession and daily activities.

iii. Promotes Connection between Teachers and Students: Good connection plays a very vital part in the success of both teachers and students. Teachers often seek measures to connect with their students as well as with each other in order to build community in their courses and technology offers the opportunity for them to connect with their students in a new and better way. It opens up different links for communication and uses the internet in explaining course material to facilitate students' learning. So many students are gravitating towards the net, therefore the use of these digital tools in the classroom, will create more room in building community with the students.

iv Fosters Collaboration: Collaboration is very vital for an engaging learning platform and the use of digital too is a great way of promoting and enhancing interaction among students. They can communicate with one another through technological means and discuss various ways they can collaborate and study together. Through collaboration, students who are more knowledgeable in computers can help other students out with their assignments and other academic tasks. This fosters a collaboration in the classroom leading to a more connected community.

v. Improves Learning: Some students learn better with technological tools. To promote students' learning, it is imperative that technology is integrated into the course design. Technology offers different techniques for teaching and learning that can enable teachers teach their students more effectively.

vi. Increases Teachers' Productivity and Efficiency: Application of technology can help teachers to improve their productivity in a great number of ways. With availability of digital tools, teachers can expand learning opportunities for their students in order to facilitate learning and students 'engagement. It also assists teachers in improving their instructional methods and promotes personalized learning. Integrating technology in classroom reduces the costs of physical instructional materials thereby, improving the efficiency of educational program.

vii. Creates Personalized Learning Opportunities: With technology, one can have 24/7 access to learning resources. Learning can be done completely online by using personal computers or mobile devices of through hybrid method by combining technology with regular face-to-face classroom learning. In both methods, technology can be used to customize learning plans to suit the learning needs of every student as teachers can deliver lessons based on student interests and capabilities. Additionally, students can learn at their own pace using technological tools. Also, the data generated from these online activities can help the teachers find out students having challenges in some subjects in order to offer supplementary support and assistance.

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viii. Sharpens Students' Critical Thinking

Technology has great impact on students' critical thinking ability. Application of technology in classroom learning makes educational activities and learning process very engaging. Technology can engage multiple senses and increase students' involvement in learning. Adequate use of technology in classroom promotes students' academic performance, motivation and confidence in classroom. It can also transform students from just sitting attentively and listening to being more participatory in class. Technology facilitates students' critical thinking by helping them apply what they have learned to real-life situations and develop problem-solving skills.

NEGATIVE EFFECT OF TECHNOLOGY ON STUDENTS' LEARNING

While technology has transformed classroom teaching and learning, its incorporation also comes with some challenges. Some of its negative impacts include:

i. Excessive dependence on technology: Over reliance on technology can make classroom learning passive, thereby diminishing critical thinking and problem-solving skills.

ii. Digital Divide: Unequal access to digital tools intensify scholastic inequalities, with some student not having the necessary facilities and reliable internet access for learning.

iii. Distraction: The use of technological tools in the classroom can be a source of distraction as some students end up accessing non-educational contents such social media and games while the class if ongoing.

iv. Poor social skills: excessive use of online learning platforms can limit face-to-face interaction. With the integration of technology into classroom, students have become more comfortable with online chatting than communicating face-to-face and this hinders the development of interpersonal relationships and social skills.

v. Health challenge: Prolonged screen time and poor ergonomic practices can contribute to various health challenges such as eye strain, sedentary lifestyle, musculoskeletal issues, disrupted sleep patterns and other potential health implications.

vi. Security Risks: Excessive use of online learning platforms can make learning institutions vulnerable to potential network security threats and compromise students' data and privacy.

vii. Lack of Technical Know How: Inadequate training for teachers on incorporation of technology effectively into learning process can adversely affect students' learning.

REMEDIES TO THE NEGATIVE EFFECTS OF TECHNOLOGY IN STUDENTS' LEARNING

Some of the potential remedies to these challenges mentioned above include:

To tackle the issue of distraction in the classroom, teachers can apply several strategies. Some of these strategies include monitoring the students closely to ensure their participation in class activities, creating technology-free time during class hour when students will not be permitted to make use of digital tools. By so doing, students will be able to develop self-control and discipline.

Also the instructor can use active teaching methodology group discussions and hands-on activities.

This method assists in engaging students on the task at hand thereby overcoming the issue of distraction.

Teachers can also reduce the level of distraction by using other engaging techniques like visual aids in keeping students engaged in the learning process. Positive learning platforms can be established through positive reinforcements for their achievements and promotion of collaboration and teamwork. All these will help in creating a positive environment that is devoid of distraction.

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The problem of cybersecurity in the classroom is a critical issue in this digital era, as many students' data are being handled by technology providers. In order to address this issue, teachers can work hand in hand with technology providers to make sure that students' data are collected, stored and used responsibly and transparently. It is also imperative that appropriate security measures such as encryption, secure password, updating security protocols and regular review be put in place to restrict unauthorized access to students' data. In addition to these security measures, institutions are to ensure that students' data are only used for learning purposes and not exposed to third parties without consent. This is achievable through the establishment of clear policies and guidelines on data collection and thorough monitoring to ensure compliance with these policies. Another important consideration is providing students with control over their own data. This means giving students the ability to review and edit their own data, as well as the ability to delete their data if they choose to do so. Furthermore, students should be educated on the importance of digital literacy and how to use of technological tools responsibly. They should be thought on the best practices for protecting their privacy and online security measures like the use of strong passwords, avoiding phishing scams and other potential security attacks.

Decreased Social skills is one of the negative impacts of incorporating technology in education that needs to be tackled. While technology provides students with easy access to information and learning resources, it also undermines social interaction and face-to-face communication. To solve this problem, students can be encouraged to participate in face-to-face interactions and teamwork. An efficient way to improve face-to-face interaction is to introduce collaborative work or discussions. Instructors can assign group projects or collaborative tasks that require physical presence. This will facilitate face-to-face communication as well as develop students' interpersonal relationship and social skills. In addition, teachers can create opportunities for physical and outdoor learning activities. By integrating physical activity such as outdoor games or sports into the curriculum, teachers can assist students in developing physical skills and improving their overall health while fostering social interaction and team spirit.

One of the biggest challenges facing educators today is digital divide. While technology is known to be a powerful tool that enhances learning and increases access to learning contents, it fosters digital divide among students that have access to technological tools and those that do not. This can worsen existing inequalities in the educational sector, especially for the marginalized, low-income and rural communities. To tackle this issue, there is need for the government and learning institutions to provide equal access to learning resources and opportunities for every student. This can be implemented through different programs and initiatives for providing technological tools such as laptops, mobile devices, computer labs and internet access to low income or rural students that do not have access to these resources. In Addition, digital divide can be reduced through policies and initiatives that promotes access to technology for all. Government or community organizations can be involved in funding technological programs or initiatives, promoting digital literacy and technical skills in the classroom and providing policies for promoting equal access to technological and learning resources.

CONCLUSION

Based on the findings, technology plays crucial roles in the classrooms and has influenced students' learning positively in so many ways. Although technology poses some challenges in students' learning, its merits far outweigh these challenges. Again, proper implementation of the solutions described above, will go a long way to eradicate the negative implications of integrating technology in classroom learning. The study therefore recommends that schools should integrate technology into their classroom learning process and ensure that all the measures are put in place so that students' learning is not negatively influenced in any way. Also the government and school owners are encouraged to make adequate supply of technological tools to schools to assist low-income students as well as occasionally organize 'train the trainer' workshops to familiarize the teachers with current technological innovations in order to enhance students' learning.

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