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Modern Technologies: The Use and Role of Immersive Classroom in Teaching & Learning and its Implications on Educational Management

Moses Adeolu AGOI[1], Oluwakemi Racheal OSHINOWO[2], *Zohaib Hassan SAIN[3], Oluwanifemi Opeyemi AGOI[4]

[1,2]Lagos State University of Education, Lagos Nigeria

[3]Faculty of Business & Management Sciences, Superior University, Pakistan

[4]Obafemi Awolowo University, Osun Nigeria

*zohaib3746@gmail.com

ABSTRAK

Peran Kecerdasan Buatan dalam membentuk kembali pendidikan tidak bisa diabaikan. Ruang kelas imersif yang didorong oleh teknologi ruang kelas seperti Virtual Reality, Augmented Reality, dan Mixed Reality mewakili kekuatan transformasi holistik yang menawarkan pengalaman pembelajaran dinamis inklusif yang tidak hanya mempersiapkan peserta didik tetapi juga pendidik menghadapi kompleksitas di dunia digital. Studi Bailenson dkk. (2015) mengungkapkan bahwa siswa yang belajar melalui pengalaman kelas yang mendalam menunjukkan pemahaman dan retensi konsep yang lebih baik dibandingkan dengan rekan-rekan mereka yang belajar menggunakan metode belajar mengajar tradisional. Makalah ini adalah tinjauan kontekstual penggunaan dan peran kelas imersif dalam proses belajar mengajar. Berbagai penerapan teknologi kelas imersif dalam proses belajar mengajar dibahas dalam makalah ini. Makalah ini juga menyoroti beberapa manfaat dan tantangan utama yang dihadapi penerapan teknologi kelas imersif dalam pendidikan. Pertanyaan yang disusun dengan cermat diberikan kepada responden menggunakan instrumen kuesioner online Google form. Tanggapan yang dikumpulkan kemudian dilakukan analisis reliabilitas. Secara meyakinkan, makalah ini menyimpulkan bahwa dengan memanfaatkan teknologi imersif, kami membantu para pendidik membuka dimensi pengetahuan baru dan memberdayakan siswa untuk berkembang di era digital. Akhirnya, rekomendasi dibuat.

Kata kunci: **Teknologi Modern; Ruang Kelas yang Imersif; Manajemen Pendidikan**

ABSTRACT

The role of Artificial Intelligence in reshaping education cannot be under mined. Immersive classroom fueled by evoking classroom technologies such as Virtual Reality, Augmented Reality and Mixed Reality represent a holistic force of transformation offering inclusive dynamic learning experience that prepares not just learners but also educators for the complexities in the digital world. The study of Bailenson et al. (2015) reveals that students who learned through the immersive classroom experiences demonstrated better understanding and retention of concepts compared to their peers who learned using traditional teaching and learning methods. This paper is a contextual review of the use and role of immersive classroom on teaching and learning. The various applications of immersive classroom technologies in teaching and learning were discussed in the paper.

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The paper also highlighted some of the key benefits and challenges confronting the implementation of immersive classroom technologies in education. Carefully constructed questions were administered to respondents using online Google form questionnaire instrument. The gathered responses were then subjected to reliability analysis. Conclusively, the paper inferred that harnessing the use of immersive technologies we help educators to unlock new dimensions of knowledge and empower learners to thrive in the digital age. Finally, recommendations were made.
Keyword: ***Modern Technologies; Immersive Classroom; Educational Management***

INTRODUCTION

In recent years, immertive technologies such as Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) are increasing gaining significant recognition in education through the creation of dynamic and interactive learning environment. These technologies have helped to integrate virtual content with the physical environment in such a way that allows users to naturally engage with blended reality. An immersive classroom is the array of such application in education representing a holistic force of transformation offering inclusive dynamic learning experience that prepares not just learners but also educators for the complexities in the digital world.

The immersive classroom uses smoke, wind and graphics to create immersive learning experience that bring the outside world into the classroom thereby allowing students to move beyond the boundaries of their immediate environment and explore complex scientific concepts, witness historical events, embark on virtual expeditions and engage in collaborative problem- solving scenarios. The key benefits of immersive classroom lie in its potential to transform traditional classroom experience into a more interactive and engaging learning environment.

RELATED LITERATURE

Coyne, et al. (2018) emphasize that it is difficult to ensure that students participate in distance courses at the same level as regular education. The study of Pozdnyakova and Pozdnyakov (2017) reveal that these difficulties are mainly associated with the fact that instructors and students are usually not physically present in the same environment. The study points that immersive classroom technologies such as VR and AR can help overcome these difficulties. Suh and Prophet (2018) provide a comprehensive analysis of the existing literature on immersive classroom technologies including virtual reality, augmented reality, and mixed reality. Barrett et al. (2021) and Wu et al. (2021) infer that immersive classroom technologies simulate the real world through the virtual world thereby

allowing users to perceive virtual components as part of their immediate environment and have immersive experiences. The study conducted by Bailenson et al. (2015) reveal that students who learned through the immersive classroom experiences demonstrated better understanding and retention of concepts compared to their peers who learned using traditional teaching and learning methods. According to Plass, et al. (2015), immersive classroom significantly enhances students' engagement and learning motivation which invariably lead to improve learning outcomes. Pavithra and Kowsalya (2020), in their survey on immersive classroom states that this approach enhances students' learning activities as well as accommodate a variety of learning methods.

Types of Immersive Classroom Technologies

So many types of immersive classroom technologies are used in teaching and learning processes.

Virtual Reality:

Virtual reality (VR) is the trending immersive technology that delivers computer-generated simulation of a three-dimensional (3D) digital environment that is interacted with in an apparent real-time manner. This immersive classroom technology is used to create an environment that is similar to the real world. Virtual reality allows teachers to impact knowledge without physically being present while learners are motivated to explore and manipulate three-dimension multimedia interactive learning tools in real time. The advantage of virtual reality over conventional teaching and learning methods is that students are given the opportunity to experience subject matter that are difficult or impossible to describe or illustrate.

Augmented Reality:

Augmented reality (AR) refers to the immersive technology that appeal to the sense of reality there by allowing the coexistence of digital information and real environments. The technology overlay digital content onto the real world thereby blending virtual elements with the users' immediate surroundings. Augmented reality allows users to see the real world with superimposed digital information. With augmented reality, students can look at a given phenomenon from different perspectives, navigate the virtual environment and freely interact with specific virtual objects.

Mixed Reality:

Mixed Reality (MR) combines the elements of virtual reality and augmented reality to create an interactive and immersive classroom experience. Mixed reality

enables learners to perceive and interact with virtual objects in a more seamless and natural manner by blending the digital and physical environment. In other word, mixed reality allows virtual and real-world objects to coexist and interact in real-time.

Benefits of Immersive Classroom Technologies

Increased Students Engagement:

Emerging immersive technologies offer numerous benefits that help to keep students engaged thereby making learning more dynamic and motivating via students' active learning, personalized and adaptive learning experiences.

Improved Retention and Conceptual Understanding:

By leveraging the use of immersive classroom technologies, students are able to experience learning in a more unique and effective ways. These technologies offer significant benefits in terms of improved retention and better understanding of the subject taught.

Cultivating Critical Thinking and Problem-Solving Skills:

Performing interactive tasks and going through immersive experiences, students are to critically think and develop effective problem-solving strategies through scenario-based simulations, reflection and meta-cognition.

Challenges of Immersive Classroom Technologies

While the emerging immersive classroom technologies offer numerous benefits, there are still other challenges confronting its implementation.

Accessibility and Equity:

Having equal opportunities by all students is very important. There are key obstacles mitigating its reality including cost implication, requirements for technical infrastructure, design inclusiveness and accommodating of diverse learners.

Teacher Training and Support:

For the successful implementation of the emerging immersive classroom, educators are expected to be familiar and understand its integration into school curriculum. This constitutes the key challenge and concern of educators and educational institutions.

Ethical and Safety Considerations:

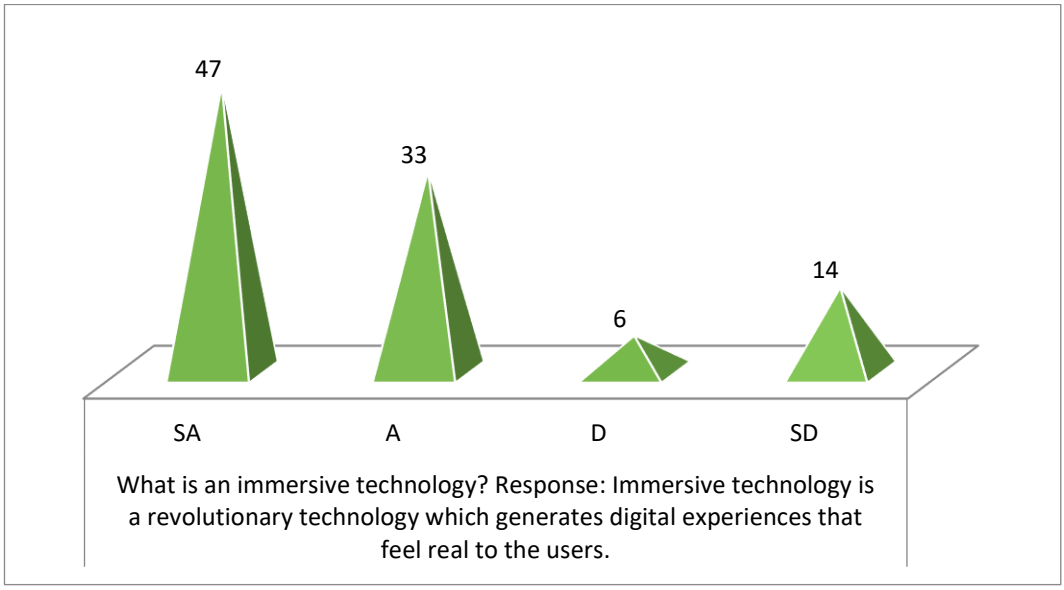
Educators and educational institutions are also expected to address ethical and safety considerations to ensure effective use of immersive classroom technologies. Hence, solutions must be provided to address privacy and data security as well as the ethical use of immersive classroom technologies.

MATERIALS AND METHODS

This paper adopted a contextual survey approach on the use and role of immersive classroom on teaching and learning in virtual classrooms. The paper discussed the various types of immersive classroom technologies in teaching and learning process. Also outlined in the paper write-up are some of the benefits and challenges confronting the implementation of immersive classroom technologies. The population of the research work consists of students, teaching and non-teaching staff of randomly selected schools in Lagos State, Nigeria. Online Google form questionnaire instrument was used to administer questionnaires to respondents. The gathered responses were subjected to Cronbach's alpha reliability analysis. The result of 0.89 gave a good reliability index of the instrument. The entire exercise took place within thirty-three (33) days before completion.

RESULTS AND DISCUSSION

Analysis Chart 1



The graph plotted in figure 1 signifies that majority of the respondents are following the trend of technological development. The respondents refer to the emerging immersive technology as a revolutionary technology which generates digital experiences that feel real to the users. The respondents explain that the emerging immersive technology gives users the experience of being able to partake, view or interact with the simulated objects and environments. According to the respondents, these experiences appear so real.

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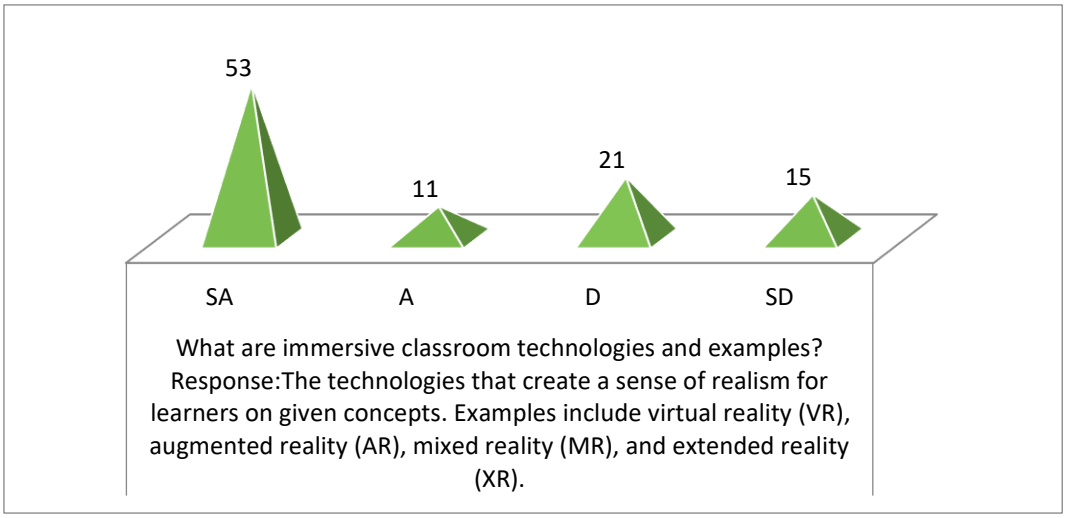
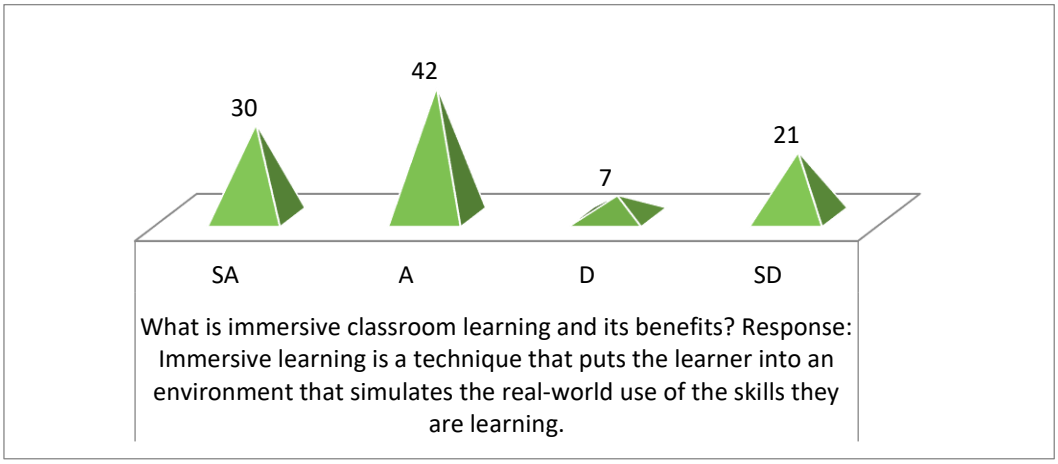
Analysis Chart 2



The chat analysis shown in figures 2 suggest that most of the respondents agree with the statement that the emerging immersive classroom technologies create a sense of realism for learners on specific concepts. The respondents highlighted that immersive classroom technologies encompass a number of tools including virtual reality (VR), augmented reality (AR), mixed reality (MR), and extended reality (XR).

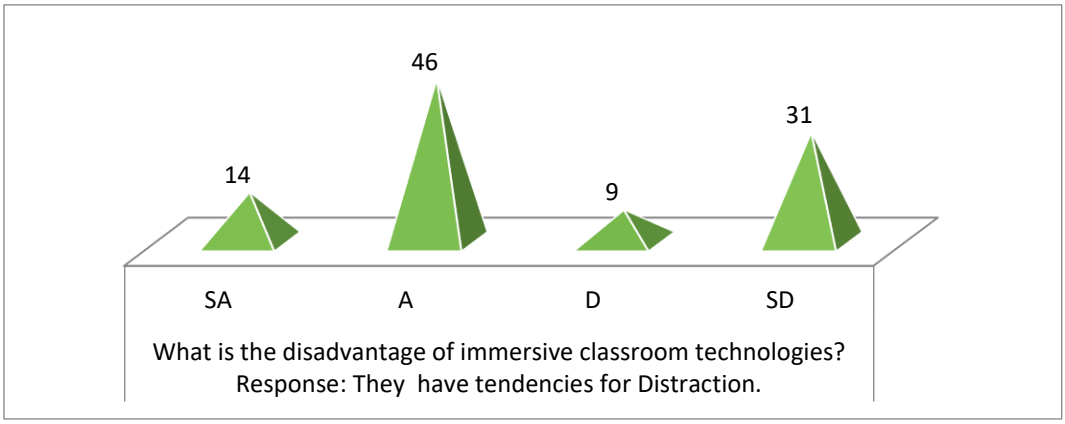
Analysis Chart 3



The graph plotted in figure 3 indicates that the benefits of immersive classroom learning among new age learners are numerous and cannot be under estimated. A greater number of the respondents infer that immersive learning is a

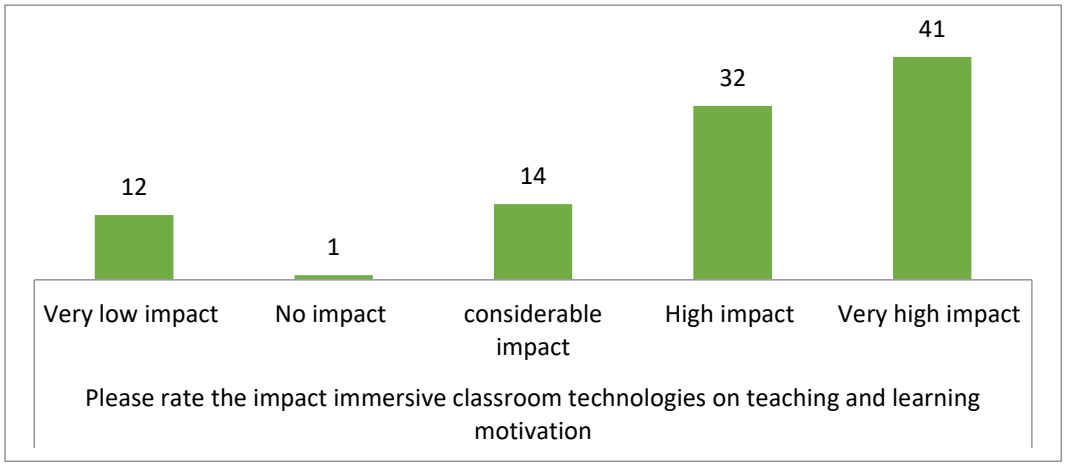
technique that puts the learner into an environment that simulates the real-world use of the skills they are learning. According to the respondents, the emerging immersive classroom accelerates learning by making the learner to insightfully experience in real-time the context in which they can use the learnt skills.

Analysis Chart 4



The chat analysis shown in figure 4 clearly reveals that as much as the emerging immersive classrooms have its advantages over traditional / pedagogical process of teaching and learning, there are still loop holes in its adoption. A huge number of the respondents agree that the disadvantage of immersive classroom technologies is that they have tendencies for distraction. According to the respondents, immersive classroom technologies can be very immersive and engaging, but the excitement of using these modern technologies by the users usually leads to distractions. The respondents denote that learners may become carried away by their virtual experiences and lose focus of the learning objectives.

Analysis Chart 5



The table shown in figure 5 reveals that the emerging immersive classroom technologies have significantly impacted education. From the table, it can be seen that a huge number of the respondents indicated that the immersive classroom technologies enhance teaching and learning and as well ensures that students are adequately engaged. The technologies have the potentials that can transform educational content as they help to create virtual world where learners are able to see and interact with computer generated environment that seemingly feels so real.

CONCLUSION

This paper discussion is focused on the use and role of immersive classroom on teaching and learning. The described the various applications of immersive classroom technologies in teaching and learning. The paper also highlighted some of the key benefits and challenges confronting the implementation of immersive classroom technologies in education. The paper discussion asserted that immersive classroom ensures personalized and active learning experiences thereby enabling students to explore complex subjects through 3D visualization, interactive simulations and visual field trips. The paper inferred that harnessing the effective use of immersive technologies will help educators to unlock new dimensions of knowledge and empower learners to thrive in the digital age.

RECOMMENDATIONS

The following recommendations were made base on the findings of this paper:

- Government and other stake holders should encourage collaborative research efforts among researchers and educators in education to help effect the implementation of immersive classroom technologies into school curriculum.
- School managers should help invest in professional development programmes that will equip educators with necessary training that supports the effective integration of immersive classroom technologies into school curriculum.
- School administrators and educators should help implement inclusive design principles to ensure that all students can fully partake and benefit from immersive classroom learning opportunities.

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