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VIRTUAL REALITY RELEVANCIES TO MOTIVATIONAL AND COMFORTABLE PEDAGOGY IN NIGERIAN UNIVERSITIES

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VIRTUAL REALITY RELEVANCIES TO MOTIVATIONAL AND COMFORTABLE PEDAGOGY IN NIGERIAN UNIVERSITIES

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Abstract

Virtual Reality is a technology that allows a user to interact with an environment (Computer-based-Simulation) whether the environment in question is a replicate of real-world or it is an imaginary world; it is the answer to touching, feeling, and experiencing what has happened in the past, currently and the future, likewise VR is simply seen as a way to simulate an environment and give the user a sense of being participated in the event, take control, and involve in the interaction with the environment with one body. Therefore, this study was conducted to change student's attitudes toward learning because of Virtual Reality implementation, to highlight major opportunities associated with the use of Virtual Reality, to show the best way to present context by teachers to achieve educational goals and objectives and to determine the relationship between technology implementation and teacher teaching effectiveness and comforts. The study used a descriptive survey design approach where teachers within Alimosho and Ojo Local Government Areas of Lagos state formed the target population with a total of 100 students and 50 teachers formed the sample for this study totalling 150 population samples used. The questionnaire was the major instrument used to collect information from the samples. The questionnaire items were validated, and the reliability index got confirmed that the instrument was reliable for the study. The results showed that virtual reality is useful to implement a change in students' attitudes to learning, to motivate students to learn, to present context by teachers in a virtual environment to achieve educational goals and objectives and enhance technology implementation and teacher teaching effectiveness and comforts. Conclusively, virtual reality implementation in education will help to determine the relationship between technology implementation and teacher teaching effectiveness and comfort.

Introduction

Over the years, Virtual Reality (VR) has gained popularity in different domains like medical, transportation, military, production, virtual friends, internet of things, and online education. In education, virtual reality has helped teachers to explain the content of the courses (Iftene & Trandabăţ, 2018); and has captured various imaginations as a futuristic concept for years of its existence (Toshniwal & Dastidar, 2014). Virtual Reality is a technology that allows a user to interact with an environment (Computer-based-Simulation) whether the environment in question is a replicate of real world or it is an imaginary world; it is the answer to touching, feeling, and experiencing what has happened in the past, currently and the future. According to Mandal, (2013), it is a way of making of our own customized world which

includes creating a video game to having an online stroll around the globe. With virtual reality, the world may be playing safe from experiencing intimidating and grueling situations. Virtual Reality is defined as the re-creation – entirely or partially- of an event/scenario to assume a physicality of being present in the event/scenario (Toshniwal & Dastidar, 2014). To Ausburn & Ausburn, (2004), VR is simply seen to simulate an environment and give the user a sense of being participated in the event, take control, and involve in the interaction with the environment with one body.

Technology advancement with virtual reality has extended the use of smart devices, among the students, to perform a series of educational activities (Dirin, 2020). The motivation following the application of virtual reality is to boost the classroom attractiveness, and to give students opportunity to retrain new information easily and to decrease the stress behind the tests when presented in the form of games (Iftene & Trandabăț, 2018). Virtual Reality is defined by Onyesolu & Eze, (2011) as the simulation of a real environment which can be felt visually in three dimensions of height, width, and depth that can be equally provided an attractive experience in actual real time motion including sounds and other forms of feedback. In complementing this assertion, Onyesolu & Eze, (2011) further added that virtual reality is a computer-manufactured, with three-dimensional environment that allows users to engage and manipulate simulated physical elements in the so-called environment and interact with representations of human fictions. It is a technology that simulates visual, auditory, and other sensory organs of complex environments. Virtual reality is observed as virtual environment which is an extension of media coverage that boosts rapid growing of interactions (Mazuryk & Gervautz, 1995).

Virtual Reality has come as a gift, most especially in education to enable the students to interact with virtual environment through normal body movements –via sensors- to explore and provide feedback that can be used to revise the display. Virtual Reality examples cover virtual solar system, virtual science experiment, virtual tour, and then virtual classroom amongst others. Hence, Virtual Reality is a technology designed to assist students to travel around and control or influence computer generated, three-dimensional, immersive-multimedia environments in real time. Asad et al., (2021) observed various areas where Virtual Reality can be applied in education to enhance educational improvement which include pedagogical tool, emerging technological tool, digital transformation, teaching/learning model, architectural pedagogy, communication skills, reading and writing skills, social learning, and experiential learning. According to Hu-Au & Lee, (2017) Virtual Reality is an immersive, hands-on technology for learning, which can play a matchless role in solving educational problems and issues. This implies its ability to reduce teachers' stress and motivate students to learn and enjoy the learning. So, Cortiz & Silva, (2017) researched on how virtual reality would improve online learning such as giving learners the sense of presence in an immersive world and provide a naïve approach to interact with colleagues and teachers when they are not in the same location physically. Authors eventually opened a platform to bring new possibilities to survey virtual reality worlds in education generally.

Objective of the Study

Generally, the objectives of the study include:

1. To implement the virtual reality for changing students' attitude to learning
2. To find out how the opportunities associated with the use of Virtual Reality motivate students to learning
3. To determine the best ways to present context by teachers on virtual environment to achieve educational goals and objectives
4. To establish the significant relationship between technology implementation and teacher teaching effectiveness and comforts via Virtual Reality

Research Questions

The below research questions guided the study:

1. Will the implementation of Virtual Reality change students' attitude to learning?
2. Will the opportunities associated with the use of Virtual Reality motivate students to learning?
3. Are there any significant best ways to present context by teachers on virtual environment to achieve educational goals and objectives?
4. Is there is any significant relationship between technology implementation and teacher teaching effectiveness and comforts via Virtual Reality?

Related Literature

The term virtual reality came up in the United States by Jaron Lanier in 1980. This term virtual reality refers to a virtual representation of reality. It is an artificially generated representation of a 3D environment and reality that may then be dealt with in a relatively natural way by human wearing computer components such as a headset with a display within and gloves with sensors. This means that something can be evident in life and practically be programmed to happen, but only digitally. The research focus on virtual reality (VR) has been trending for years; in the early 1990's speculation on its potential already existed. VR promised to bring an exciting future – where everyone would waive their hands to travel through strange neon geometric places, converse with virtual people, and experience adventures in perfectly simulated worlds or times. Today, we are greeted with a very different landscape; the technology that once was not accessible by just ordinary persons is now readily available.

According to Toshniwal & Dastidar, (2014), Virtual Reality is a part of a larger family of technology-mediated experiences involving a varying degree of blends of reality with virtual components. Related areas along this continuum of reality and vitalities are augmented reality and mixed reality (Hu-Au & Lee, (2017). Virtual reality is a technology that allows students to explore and manipulate computer generated, 3-dimensional, multimedia environments in real time. Virtual reality is a technology that can provide both affordable (less than $10 per user for Google Cardboard) and interactive learning experiences, which has garnered for it the interest of educators, including library instructors. The findings of Brady & Wang, (2019) have potential implications for library instructors considering implementing virtual reality in their information literacy courses.

In education, the main reasons why VR is becoming so popular are its immersive, imaginative, and interactive features and it allows the student to be placed in different environments with a realism that could never be achieved with a textbook; avoiding, at the same time, certain elements that could obstruct learning. Its use in the educational field allows students to be immersed in countless settings and time periods. It was described that this technology as a tool capable of breaking the space-time barriers of the educational context, thus achieving experiential learning.
A VR experience can provide users with a presence in a psychological sense and immersion in a physical sense—Immersion refers to the extent that users are isolated from the real world. In a full immersive system, users are fully encompassed by a VE and do not interact with the real world, whilst in a semi-immersive or even non-immersive system; users have some interaction with the real world. The feeling of ─presence is subjective and related to users 'psychology. However, it is undoubtedly influenced by the ability of the VR to provide high-quality data to users 'senses. In summary, VR is a type of technology that allow users to navigate and interact with a simulation in real time that influences users 'five senses, thereby providing them with the experience of psychological and physical presence in the VR.

Empirical studies in the past were analyzed to explore how virtual reality functions in the teaching-learning process, as a pedagogical tool. Virtual reality is a computer-assisted program that presents a virtual environment. However, it was not developed to be used as a pedagogical tool, i.e., to support, lead, or facilitate the teaching and learning process. In 1966, the first-ever documented use of a computer-assisted virtual environment when the United States Air Force developed a flight simulator was for training purposes (Page, 2000). During that time, virtual reality was used in other fields, but it was failed in almost all market-led departments. Despite its systemic failure, several reviews of virtual reality's use in education have found promising results, including improved time on task, satisfaction, inspiration, comprehensible input, and long-term commitment (Apostolellis & Bowman, 2014, Cheung et al., 2013).
Moreover, for distance learning, learners' geographic location is meaningless since all the applications studied were intended to mimic real-world learning environments. Students can access the course materials and services of leading institutions worldwide by distance learning, and several surveys have shown that virtual reality enables students to enjoy the process of learning even in distance learning programs (Hristov et al., 2013). Students are expected to operate essential resources on institutions. Virtual reality is merely a tool for delivering distance learning, but it promotes all its various benefits. Students who use distance learning want learning experiences comparable to those offered in traditional settings (Schwaab et al., 2011).

To Graziano, (2018) technology can be a powerful tool for transforming learning. It can help affirm and advance relationships between educators and students, reinvent our approaches to learning and collaboration, shrink long-standing equity and accessibility gaps, and adapt learning experiences to meet the needs of all learners. However, to

realize fully the benefits of technology in our education system and provide authentic learning experiences, educators need to use technology effectively in their practices

Methodology

The research design used for this study was descriptive survey design type. To capture the Relevance of Virtual Reality on Students' Learning Motivation and Teachers' Teaching Comforts in Nigerian Universities, the target population involved teachers and students in higher institutions within Alimosho, and Ojo Local Government Areas of Lagos state. A total of 150 respondents formed the sample for this study. Five secondary schools were used within the local government areas chosen. One hundred students were randomly selected from the schools while fifty teachers were equally selected from the five schools (i.e 20 students in each school; 10 teachers in each school). Questionnaire was the major instrument used to collect information from the samples. The instrument items/statements drafted by the researcher were validated by experts in the field of computing. Chronbach's alpha statistical analyses was used to test reliability of the instrument with 0.88 indexes; of which considered appropriate for the study. The data collected were collated and subjected to statistical tools for proper analysis. The analysis was done using tables, charts, and other descriptive statistics with the aid of SPSS statistical package.

Result

Students' Responses Analysis and Interpretation

HO1: The implementation of Virtual Reality will not change students' attitude to learning

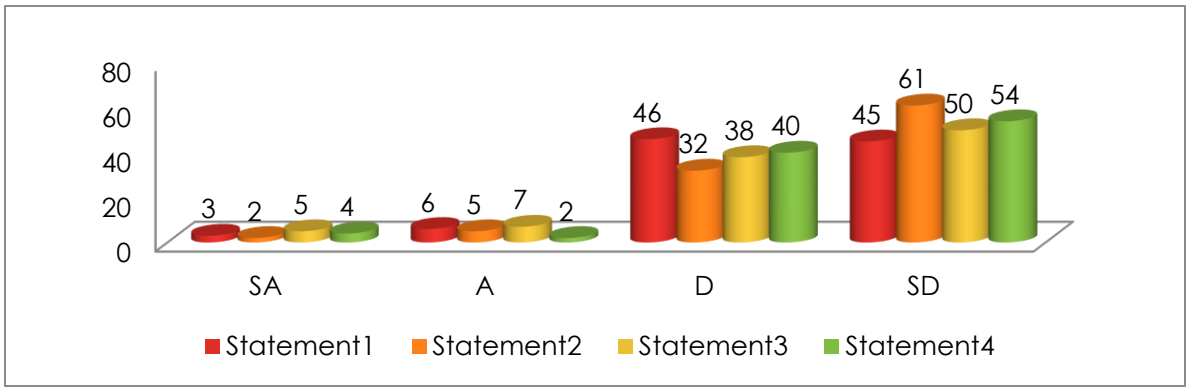

Fig.1: Virtual Reality and students' attitude to learning

The fig.1 explains whether the implementation of Virtual Reality will or will not change students' attitude to learning. Responses of participants showed that 46+45 disagree and strongly disagree to statement 1, 32+61 disagree and strongly disagree to statement2, 38+50 disagree and strongly disagree to statement3, and 40+54 disagree and strongly disagree to statement4 respectively. This means that virtually all participants disagree or strongly disagree to the null hypothesis formulated that says, 'The implementation of Virtual Reality will not change students' attitude to learning' to consider an alternative hypothesis that says, 'The implementation of Virtual Reality will change students' attitude to learning'. It concludes that virtual reality implementation will change students' negative attitudes to positive type.

HO2: The opportunities associated with the use of Virtual Reality will not motivate students to learning

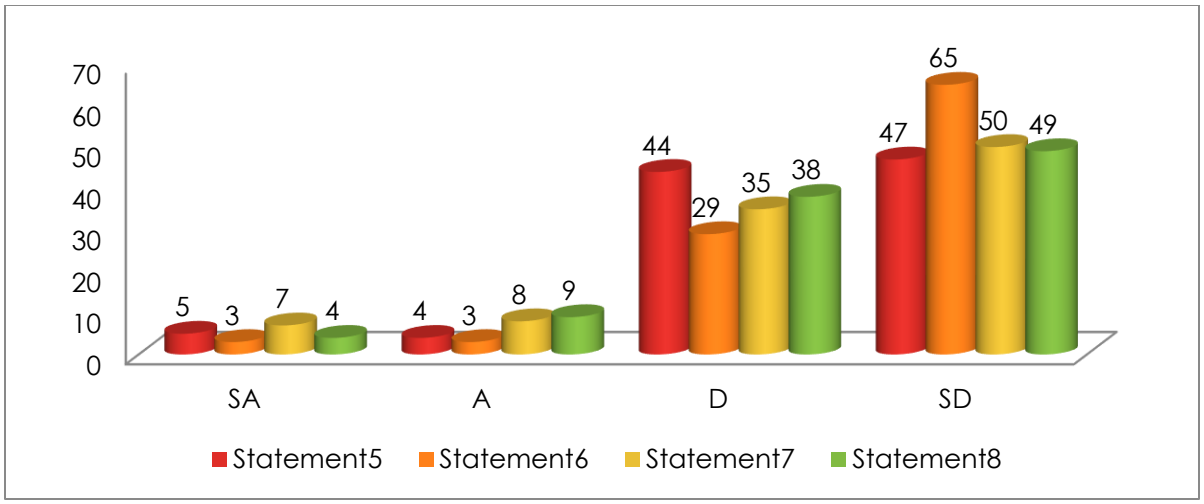

Fig.2: Virtual Reality and students' motivation to learning

In the fig.2, the opportunities associated with the use of Virtual Reality was tested whether will or will not motivate students to learning. Responses of participants showed that 44+47 disagree and strongly disagree to statement 5, 29+65 disagree and strongly disagree to statement6, 35+50 disagree and strongly disagree to statement7, and 38+49 disagree and strongly disagree to statement8 respectively. This means that virtually all participants disagree or strongly disagree to the null hypothesis formulated that says, 'The opportunities associated with the use of Virtual Reality will not motivate students to learning and to consider an alternative hypothesis that says, 'The opportunities associated with the use of Virtual Reality will motivate students to learning'. It concludes that virtual reality implementation will motivate students towards learning and make the learning interesting.

HO3: There are no significant best ways to present context by teachers on virtual environment to achieve educational goals and objectives

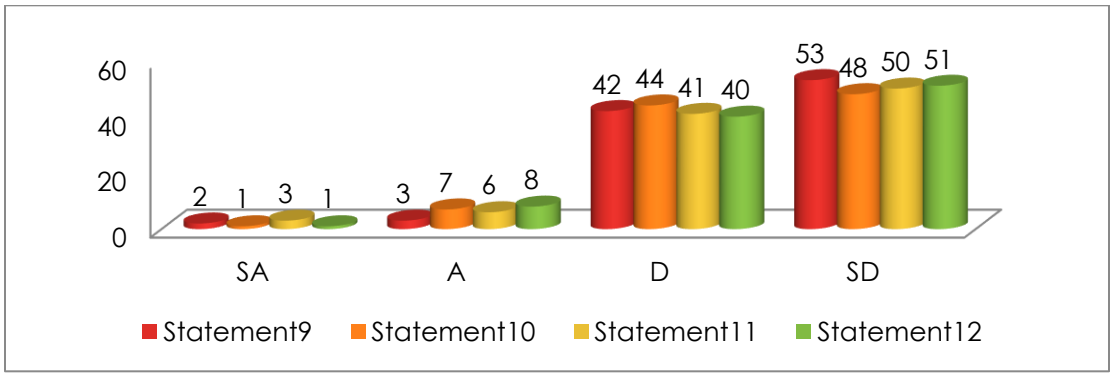

Fig.3: Context presentation in a virtual environment

In looking for the best ways to present context by teachers on virtual environment to achieve educational goals and objectives, fig.3 depicts students' responses towards this. It was shown that 42+53 disagree and strongly disagree to statement 9, 44+48 disagrees and strongly disagrees to statement10, 41+50 disagrees and strongly disagrees to statement11, and 40+51 disagrees and strongly disagrees to statement12 respectively. This means that virtually all participants disagree or strongly disagree to the null hypothesis formulated that says 'There are no significant best ways to present context by teachers on virtual environment to achieve educational goals and objectives and to consider an alternative hypothesis that says 'There are significant best ways to present context by teachers on virtual environment to achieve educational goals and objectives. It implies that virtual reality opens many doors for achieving educational goals and objectives through various ways to present contents and contexts.

HO4: There is no significant relationship between technology implementation and teacher teaching effectiveness and comforts via Virtual Reality

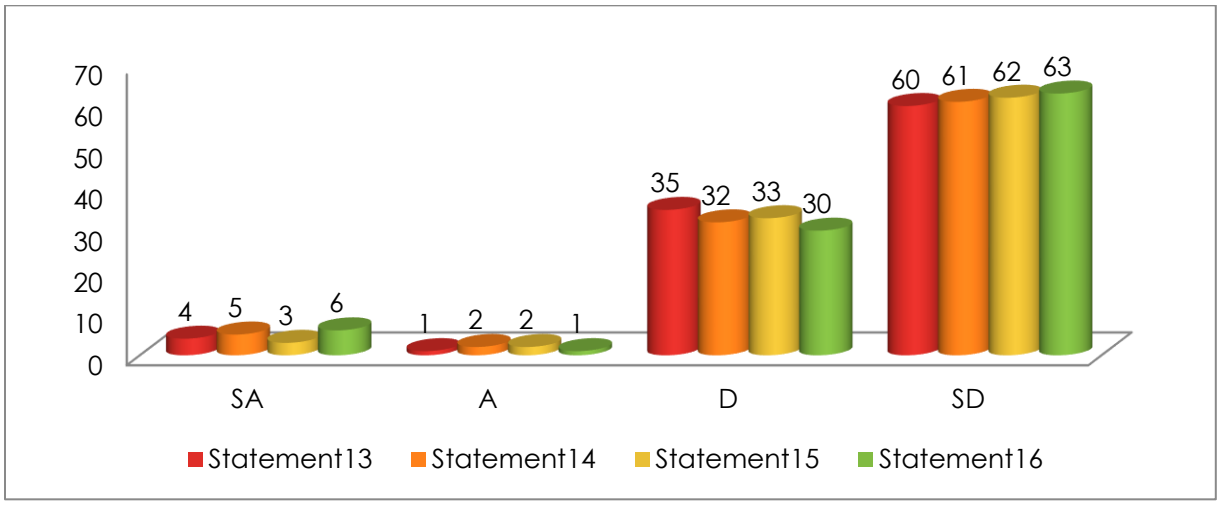

Fig.4: Technology implementation and teaching effectiveness and comforts via Virtual Reality

Regarding the technology implementation and teacher teaching effectiveness and comforts via Virtual Reality, fig.4 pinpoints the students' responses to this. It was shown that 35+60 disagree and strongly disagree to statement 13, 32+61 disagrees and strongly disagrees to statement14, 33+62 disagrees and strongly disagrees to statement15, and 30+63 disagrees and strongly disagrees to statement16 respectively. This means that virtually all participants disagree or strongly disagree to the null hypothesis formulated that says, 'There is no significant relationship between technology implementation and teacher teaching effectiveness and comforts via Virtual Reality and to consider an alternative hypothesis that says 'There is significant relationship between technology implementation and teacher teaching effectiveness and comforts via Virtual Reality'. It implies that virtual reality can be used to achieve teaching effectiveness and comforts.

Teachers' Responses Analysis and Interpretation

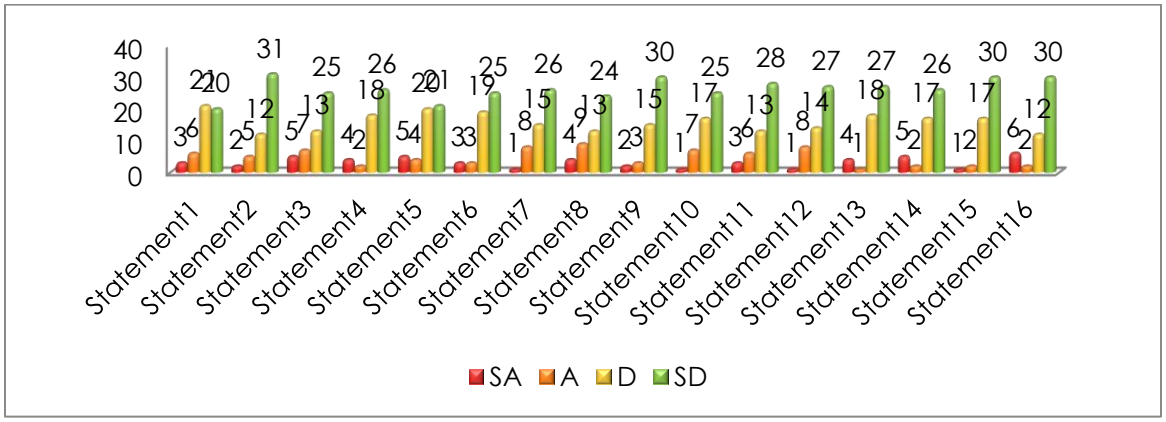

Fig.5: Teachers' responses to the statements regarding all the four hypotheses

Teachers' responses to the four hypotheses formulated were displayed in fig.5 across all the sixteen statements. It shows that 21+20 disagree and strongly disagree to statement 1, 12+31 disagrees and strongly disagrees to statement2, 13+25 disagrees and strongly disagrees to statement3, and 18+26 disagrees and strongly disagrees to statement4, 20+21 disagrees and strongly disagrees to statement5, 19+25 disagrees and strongly disagrees to statement6, and 15+26 disagrees and strongly disagrees to statement7, 13+24 disagree and strongly disagree to statement 8, 15+30 disagrees and strongly disagrees to statement9, 17+25 disagrees and strongly disagrees to statement10, 13+28

disagrees and strongly disagrees to statement11, 14+27 disagrees and strongly disagrees to statement12, 18+27 disagrees and strongly disagrees to statement13, 17+26 disagrees and strongly disagrees to statement14, 17+30 disagrees and strongly disagrees to statement15, and 12+30 disagrees and strongly disagrees to statement16 respectively. This means that majority of all participants disagree or strongly disagree to the four null hypotheses formulated. The results complement the finding gotten from students' views towards the formulated hypotheses.

Discussion

The findings show clearly that virtual reality is useful to implement a change in students' attitude to learning, to motivate students to learning, to present context by teachers on virtual environment to achieve educational goals and objectives, and to enhance technology implementation and teacher teaching effectiveness and comforts. These results were supported with views of scholars like Merchant, Goetz & Cifuentes, (2014), VR and technology in general, is believed to facilitate learning through engagement, immersion, and interactivity. VR Technology is also lauded for its ability to provide a more customized learning experience that can be accessed at the learner's convenience. it is also viewed as promising because of its unique ability to immerse learners in environments they are studying, such as in ancient cities, manufacturing environments, or a look into the human body. Also, Ai-Lim Lee, Wong & Fung, (2010) asserted that research into the effectiveness of technology based educational tools, including VR, has demonstrated tangible benefits, such as reduced learning time and better learning outcomes. Technologies such as VR have also greatly expanded both access to educational opportunities as well as a range of programs that could be offered in an online setting. The ideology that pivots round virtual reality cuts through the apex of socio-education development in the modern society. Its applications are embraced on system into its numerous disparate fields. Virtual reality goals are channelled towards using 3D virtual objects as tools to enhance the perception and interaction of learners with real instructional materials by causing 3D virtual world to seamlessly appear within the 3D learning environment of the real world. Virtual reality engraved with potential to promote learning efficiency in the innumerable fields of education by offing real contents with computer-generated imagery. Hence, virtual reality could provide more opportunities for authentic learning skills in the education sector.

Conclusion

This study shows that use of Virtual Reality in education will foster Students' Learning Motivation as well as Teachers' Teaching Comforts in higher institutions. Meanwhile, the study also found that virtual reality can be used to change students' attitude to learning, highlight various opportunities associated to the use of virtual reality, help teachers to show the best way to present context to achieve stated educational goals/aims. Finally, virtual reality implementation in education will help to determine the relationship between technology implementation and teacher teaching effectiveness and comforts.

Recommendations

Therefore, the following recommendations are made:

1. Teachers should be mandated to upgrade their knowledge by attending a series of workshops and seminars on the implementation of virtual reality in education
2. Government should from time to time make provision for the necessary gadgets to implement virtual reality in teaching and learning
3. Proper monitoring of students must be enforced by teachers and school managers to ensure high participation of students in the implementation

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