

Can Virtual Reality be a Solution Provider for Societal Issues? -A Systematic Review

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Abstract:- VR can enhance the lives of workers who labour in dangerous or uncomfortable conditions, and it may someday have an effect on society as a whole. Industry 4.0 and the Industrial Internet have accelerated the development of virtual reality as a platform for next-generation internet-connected manufacturing production lines that are essential to the creation of the smart factory. Cybersickness (CS), often referred to as virtual simulator sickness, visually induced motion sickness, or symptoms brought on by virtual reality, is the term for the unpleasant side effects that users may encounter while immersed in the technology (VR). This systematic review highlights the transformative potential of VR in addressing societal issues. It emphasizes the need for continued research and development to overcome challenges and maximize the benefits of VR technology. By leveraging the immersive and interactive nature of VR, innovative solutions can be designed to tackle complex societal problems, fostering positive change and societal well-being.

Keyword:- *Virtual Reality, immersive, Augmented Reality.*

I. INTRODUCTION

Virtual Reality(VR) has become a topic of interest for researchers in recent years (Wohlgenannt et al., 2020). According to online oxford dictionary VR means computer-generated copy of a 3-D environment that can be interacted with in a seemingly real way by a human using special electronic device, such as a helmet with a screen inside or gloves fitted with sensors (Freina & Ott, 2015). Virtual reality described in terms of a collection of technological hardware which is capable of imitating real and imagined worlds (Mikropoulos & Natsis, 2011)

VR typically created by using a head-mounted displays (HMDs) and enables users to submerge themselves into a virtual world by blocking out the real world (Brooks, 2005). The Sensorium was the first real example of a multisensual simulator, It was developed in 1962 by Ted Sperling and John Moller and it used three screens that displayed different images simultaneously. The first time it was ever exhibited publicly was at the New York World's Fair in 1964 (Gigante, 1993), Ivan Sutherland offered “the Ultimate Display,” a head-mounted device that he suggested would serve as a

“window into a virtual world.” His invention was revolutionary for its time and has since been widely recognized as one of the most significant developments in computer graphics history.

The 1970s and 1980s were a heady time in the field, where advances in optical technology ran parallel to project that worked on haptic devices and other instruments that would allow you to move around in the virtual space. In the mid 1980s, the Virtual Interface Environment workstation(VIEW) system combined a head-mounted device with gloves to enable the haptic interaction at NASA Ames Research Center (Gigante, 1993).

➤ *Application of VR*

Virtual reality (VR) has been applied in developing systems for vehicle simulation, robot control, decision support and analysis, virtual interfaces to complex systems, entertainment, electronic art, medical science, and education (Ojha, 1994). VR can be used through various displays like desktop computer, a head-mounted display (HMD), or a cave automatic virtual environment (Buttussi & Chittaro, 2018). Cave automatic virtual environment means a room which replaced by screen and created a virtual environment all around the person who want to experience virtual world (Onime et al., 2017). VE have the capability to change the view point and move the place that allow user to affiance with sub component of the 3D environment, Three-dimension and VE describe as system which key conceptual criteria that the person is able to feel the computer created image in depth (Wann & Mon-Williams, 1996).

➤ *Components of VR*

Virtual Reality have 4 primary elements like virtual world, immersion, sensory feedback, interactivity. Virtual World utilization behaviors and engagement signs represent the ideal approach with which managers of the instructional virtual Worlds can determine how customers use the net functions to be had, which tools have extra popularity, and which equipment are more useful for customers (Cruz-Benito et al., 2015). It's going to nevertheless be quite a while earlier than the line separating the real global and the digital world disappears absolutely. but, structures were created which display that it's miles feasible to make the difference among what's real and what is virtual a bit extra difficult to decide.

The end result of such combos is a substantially superior experience of realism to experiences in those digital environments (Metzger & Street, n.d.).

➤ *Immersion*

Using immersive graphics content and music, immersion refers to bringing the experience closer to reality. While playing a game or viewing a movie, users can completely immerse themselves in the virtual environment with the aid of a VR headset and spatial audio (Bowman & McMahan, 2007).

➤ *Sensory Feedback*

VR creates a space where a user can walk around, follow their motion on the screen, and change positions with the aid of VR equipment by imitating the principle of human perception. Sometimes VR goes beyond just audio and video, experimenting with other senses like taste, touch, and force to create an immersive experience (Dadarlat et al., 2015).

➤ *Interactivity*

With the aid of sensor-enabled technology, the real-time interaction on screen creates a sense of inclusion and immersion between the user and the VR system. In the virtual environment, a user can, for instance, slay a monster, shoot, kick, or pick something up on the screen (Bailenson et al., 2008).

II. LITERATURE REVIEW

Virtual and augmented reality (VAR) generation is one of the maximum floor breaking technology of this century, and better training is inside the early tiers of adopting the innovative technology as a teaching device better schooling institutions have an crucial role in our societies to useful resource in innovation diffusion .This have a look at has demonstrated there is the vital adoption fees of innovative VR coaching at a college huge level, to completely make use of a purpose constructed VR laboratory (Marks & Thomas, 2022). As a education tool, virtual fact is experiencing a period of explosive increase and development due, in element, to the arrival of low-cost and easy to apply immersive head-set up presentations and peripheral generation. The effectiveness of virtual reality training has been proven in many special domain names from surgical education to manufacturing and meeting (Carruth, 2017). virtual truth allows for a more correct demonstration of functionality or activities. An critical element of VR in training is that VR content material will permit students to recognise and explore even abstract or difficult-to-study understanding in a risk-unfastened environment VR instructional applications with a local point on the Oculus shop. The studies identified the regions of nature, space, remedy, art and history as the 5 most famous VR utility areas. most packages use English because the conversation language, and extra than half of the pattern packages are to be had freed from free (Freina & Ott, 2015) .The unique Technology Acceptance Model (TAM) elements

had the strongest relationships. Relationships between elements in particular relevant to VR era and getting to know were additionally supported. The effects of this examine may also guide different educators inquisitive about incorporating VR right into a dynamic learning surroundings. VR technology are being incorporated into instructional applications, in particular in dynamic learning environments, to train college students and beginners on complicated situations in a safe and controlled surroundings, and practice iterative approaches without impacting the wear and tear and tear of steeply-priced simulators (Fussell & Truong, 2022). particularly in schooling , more and more researchers have started out to put into effect AR/VR technologies to offer college students or trainees with a visible, immersive, and interactive environment the worldwide unfold of COVID-19 has substantially impacted education. Researchers and educational studies establishments urgently need to examine from the COVID-19 disaster. human beings receiving better schooling intention to mirror on a way to create a extra innovative and bendy educational paradigm. within the AEC industry, the rapid development of AR/VR technologies shows its capacity for implementation in schooling (Tan et al., 2022). Augmented truth (AR) is an emerging era that integrates virtual information, which includes textual content, photographs, videos, and three-D objects, into the real global. The term “Augmented reality” become first proposed via Boeing personnel in 1990 (Onime et al., 2017). all over the world, universities and different tertiary training establishments are presently facing many challenges and problems. a number of those challenges are incumbent and others have emerged due to the fitness crisis we are experiencing at international scale. inside this context, the non-stop need for improvement is turning into an vital for universities to address the demanding situations associated with designing and developing powerful student stories(Shen et al., 2022). researchers have started to recollect using VR in nursing or medical education . for example, Huang, Yang, Hsieh, Wang, and Hung (2018) implemented VR in dentistry curricula to enhance learners’ dental skills and reduce the risk of surgery(Chang et al., 2022). Some of the principle benefits of VR labs provide to educational establishments are the value discount, the expanded availability and accessibility, and the stepped forward protection for students we used an experimental layout to examine academic approaches regarding microscopy. However, the truth that the participants of the E-institution used the VR biology lab to honestly conduct the microscopy test most effective as soon as might not be the great manner to assess the capability effect of immersive VR for getting to know and training (Paxinou et al., 2020).Biology VR video games, animations, and simulations were evolved for each educational and for amusement purposes. packages of VR in biology have been shown to improve excessive school students’ understandings in abstract concepts in microbiology, As a go-platform multiplayer VR and tablet game designed for the high faculty biology classroom, CLEVR is an formidable undertaking. we've considered that a game performed in a collaborative school

room surroundings calls for unique design choices than a unmarried-participant or multiplayer recreation in a only virtual surroundings (Wang et al., 2022). A sport–primarily based VRLE integrates a VR–primarily based getting to know environment with a VR–based totally sport. as compared to VRLE, sport–primarily based VRLE showcases its advantages with the aid of providing challenges and enjoyment, which manifestly improve getting to know motivation. This study aimed to research whether a GIVRLE facilitate quadratic characteristic mastering in junior excessive faculty college students who had never been taught such content (Shi et al., 2022). VR lecture room shows potential as a device for adding depth to their mastering. The opportunity of immersing college students in a digital environment could provide a solution to motivation and engagement troubles for now a days college student in addition to a approach to a number of the present day constraints faced through teachers, We created and evaluated a VR school room that uses various equipment to educate meals protection messages. The wonderful reaction to the machine highlights sturdy capacity to motivate college students, and individuals' robust agreement that it become a laugh, their desire to apply the gadget again and interest in incorporating comparable era into other situation regions highlights the capability of this sort of era to foster engagement (Gorman et al., 2022). VR content material-growing challenge greater college students' intracultural mastering. the students' statements indicated that the immersion afforded in VR content material have allowed them to:

- Make sense of and scaffold their prior information with new information of intracultural studying;
- Prepare and structure what they recognize about their local tradition and actively generate the know-how they have got won into practice
- Foster them to be intracultural communicators as they now not only want to critically reflect on consideration on how to construct the data in an easily understood manner in English, but also deliver their viewers an real experience of having virtually visited the web page in individual (Yeh et al., 2022).

Presently, there may be a speedy improvement of a sequence of rising exponential technologies which include cloud and aspect computing, high-speed mobile net, massive statistics, synthetic intelligence, robotics, nanotechnology, net of factors, biotechnology, 3-d printing, and extended truth. the truth that the pattern covered teachers from all subjects and genders, a sturdy majority of whom had little publicity and enjoy with VR, had been elements that would alleviate potentially biased, techno-optimist opinion (Vayssiere et al., 2022). due to the COVID-19 pandemic, maximum in-individual academic institutions and training have shifted to on-line schooling. online verbal exchange employs remote methods that consist of video conferencing and voice electronic mail VR is a technology that permits customers to correctly immerse themselves in a virtual surroundings, imparting a brand new alternative to remote education (Lee et

al., 2022). A variety of media and technologies enable 3D virtual world learning settings to offer a more dynamic platform for social engagement, communication, expression, and learning methodologies. Thus, developing students' transmedia skills is one of the main objectives of new media literacy education in the digital age (Merchant, 2010).

➤ *Various Area*

Concerning the coaching of records, VR gives limitless get right of entry to without travelling to any actual or created space, with in the gift, destiny or beyond VR lets in to recreate ancient cities, buildings and monuments, including Egyptian thumbs, as an example, which might be inaccessible or partially destroyed, and that would now not be therefore approachable in the real world (Villena Taranilla et al., 2022). In 1999, BMW started to explore and use VR's ability to analyze products in the design phase. The results demonstrate that VR technology has the potential to reduce the number of required versions of the model (Firu et al., 2020)Virtual Prototyping (VP). As a sub-section of Design, Virtual Prototypes are in some instances used to replace physical mockups. With recent progress in the capabilities and development of software and hardware, VR can replicate physical models allowing for a drastic cost and time reduction derived from the avoidance of building physical mock-up Manufacturing. The use of VR (Kulkarni et al., 2011) to manufacturing has been define as the use of VR or computers to develop a product(Shukla et al., 1996). There has been a developing hobby within the use of virtual technology in helping and improving fieldwork inside Geography. digital discipline journeys (VFTs) have a protracted history inside geographical teaching as internet applications and software program were used to expand fieldwork courses, knowledge and ability. VR/AR can be used to motivate and have interaction college students in key fieldwork practices and techniques; inspire vital visible literacy capabilities and enhance rent-ability possibilities as said technology develop in commercial utilization and applications (Bos et al., 2022)

It's far vital to broaden the architectural engineering training using multimedia which include, immersive digital truth, videos, and simulation technology virtual truth generation (VR) and interplay by means of 3-d geometric version may want to deliver an give up to the passive getting to know which is accompanied within the traditional technique of schooling the usage of VR era is an critical device to switch from teacher – centered method to pupil- focused method of mastering (Bashabsheh et al., 2019). It became discovered that the use of the approach of visualization of areas in VR contributes to an development inside the know-how of proposals and answers layout, with interplay between the contributors and the projected surroundings, assisting inside the choice making (Calvert, 2019).The tourism industry became in most cases suffering from the pandemic due to the regulation imposed via the authorities, which limited get entry to groups, thereby making it possible for human beings to go to vacationer regions.

consequently, tourism-related industries consisting of hoteliers, airlines, eating places, visitor appeal managers, memento facilities, tour retailers, and excursion publications skilled a decline in sales (Oncioiu & Priescu, 2022)

VR has been utilized for education non-technical competencies, consisting of communication, teamwork, and situational focus in fitness care professionals VR and AR display blessings in preoperative making plans and multimodal neuron avigation for backbone and mind surgical operation. In addition, the included studies cautioned that VR and AR have beneficial effects for medical schooling and neurosurgical education (Mishra et al., 2022) People who have gone through or witnessed a terrible incident like a natural disaster, a serious accident, a terrorist attack, a sexual assault, or a war or conflict may develop post-traumatic stress disorder (PTSD). Bypassing avoidance symptoms and facilitating control on the side of the therapist, virtual reality exposure therapy facilitates emotional engagement of patients with combat-related PTSD during exposure to a virtual battle scene (Vianez et al., 2022). A variety of media and technologies enable 3D virtual world learning settings to offer a more dynamic platform for social engagement, communication, expression, and learning methodologies. Thus, developing students' transmedia skills is one of the main objectives of new media literacy education in the digital age (Merchant, 2010). Construction safety instruction using a VR technology for experience learning. The proposed solution improved teaching and learning procedures for construction safety and health by utilize the cutting-edge SL virtual environment (Le et al., 2015). To ensure the effectiveness and safety of operations that are carried out concurrently, construction activity planning specifically calls for the allocation of workstations on the construction site (Getuli et al., 2020). By facilitating a process of contextual authentic learning, teacher coaching, peer cooperation, articulation of the obtained material, and reflection, the VR (Xie et al., 2021).

One of the frequent mental disorders with a low percentage of treatment seeking is social anxiety. The use of virtual reality exposure therapy as a kind of treatment for social anxiety disorder shows promise (SAD). Our goal was to determine whether self-training utilizing a newly created mobile-based virtual reality tool might effectively treat SAD at a reasonable cost. The results of this study shown that the mobile-based VR programming significantly improved different self-report questionnaire accounts and produced positive changes in social components as indicated by the in-app variables (Kim et al., 2017). Programming languages and development tools geared toward creating mobile applications are numerous. This is also true with virtual reality, where many development platforms, such Unreal and Unity, are focused on implementing virtual reality systems (Izard et al., 2017). Safe patient outcomes depend on the evaluation and training of the complex psychomotor skills required for surgical procedures. Virtual reality simulators are therefore being used to comprehend, assess, and develop these skills.

The MLASE checklist was created to assist researchers in computer science, medicine, and education in ensuring the quality of virtual reality articles they produce and review that employ machine learning to evaluate surgical expertise in virtual reality simulation (Winkler-Schwartz et al., 2019). Due to simulator sickness, cybersickness—the sensation of motion sickness in virtual environments—has long been a problem in virtual reality (VR). According to earlier studies, cybersickness affects somewhere between 30% and 80% of the population (Chen et al., 2011). Cybersickness is the occurrence of motion-sickness-like symptoms brought on by virtual stimuli. Visually induced motion sickness (VIMS) is closely related to cybersickness, which is typically used to refer to virtual reality or augmented reality. Results from motion sickness research may not necessarily apply to cybersickness studies (Rebenitsch & Owen, 2021)

➤ *Future Prospective of VR*

Future perspectives of VR as a solution provider for societal issues include advancements in hardware and software technologies, increased affordability and accessibility, integration with other emerging technologies such as artificial intelligence and augmented reality, and the development of ethical guidelines for VR implementation. Moreover, interdisciplinary collaborations between researchers, practitioners, policymakers, and industry experts will be crucial in harnessing the full potential of VR.

However, challenges such as user acceptance, data privacy, and ethical concerns must be addressed to ensure responsible and effective implementation of VR solutions. Future research should focus on long-term effectiveness, scalability, and sustainability of VR interventions, as well as exploring new application areas for VR in addressing emerging societal challenges.

III. DISCUSSION

Virtual and augmented reality (VAR) generation is one of the maximum floor breaking technology of this century, and better training is inside the early tiers of adopting the innovative technology as a teaching device. The effectiveness of virtual reality training has been proven in many special domain names from surgical education to manufacturing and meeting. Augmented reality (AR) is an emerging era that integrates virtual information, which includes textual content, photographs, videos, and three-D objects, into the real global. Researchers have started to recollect using VR in nursing or medical education. Some of the principle benefits of VR labs provide to educational establishments are the value discount, the expanded availability and accessibility, and the stepped forward protection for students. The opportunity of immersing college students in a digital environment could provide a solution to motivation and engagement troubles for now a days college student. This study aimed to research whether a GIVRLE facilitate quadratic characteristic mastering in junior

excessive faculty college students who had never been taught such content. VR lecture room shows potential as a device for adding depth to their mastering. Virtual reality (VR) may be a new alternative to remote education as the COVID-19 pandemic, maximum in-individual academic institutions and training have shifted to on-line schooling. Online verbal exchange employs remote methods that consist of video conferencing and voice e-mail. VR is a technology that permits customers to correctly immerse themselves in a virtual surroundings. The pattern covered teachers from all subjects and genders, with little publicity and enjoy with VR, had been elements that would alleviate potentially biased techno-optimist opinion.

Virtual Prototypes (VP) are in some instances used to replace physical mockups. VR can replicate physical models allowing for a drastic cost and time reduction derived from the avoidance of building physical mock-ups. The use of VR to manufacturing has been define as the use of VR or computers to develop a product. VR can be used to motivate and inspire college students in key fieldwork practices and techniques. VR and AR are present in a variety of important hardware and software in medicine, even though 3 primary traits are shared: immersion, presence, and interplay. Simulation in ophthalmology is a singular technique that has verified to be effective and promises to be a part of the future of ophthalmologist education applications global. VR and AR display blessings in preoperative making plans and multimodal neuron avigation for backbone and mind surgical operation. Developing students' transmedia skills is one of the main objectives of new media literacy education in the digital age. To ensure the effectiveness and safety of operations that are carried out concurrently, construction activity planning specifically calls for the allocation of work-stations on the construction site. The use of virtual reality exposure therapy as a kind of treatment for social anxiety disorder shows promise (SAD). The extent to which virtual reality (VR) is influencing the development of an electronic society is examined in this special issue. The author presents a framework for enhancing e-commerce trust through the effective application of VR technologies. The MLASE checklist was created to assist researchers in computer science, medicine, and education in ensuring the quality of virtual reality articles they produce and review.

IV. CONCLUSION

Applications that go beyond leisure, tourism, or marketing are now in high demand on the market, and they must also be more user-friendly and economical. Additionally, virtual interfaces must be enhanced to prevent flaws like clipping, which gives the appearance that some solid objects can pass through. Or to lessen the negative impacts that VR has on users, such as motion sickness, which is caused by a mismatch between our body's movement and what is perceived in the virtual world and causes dizziness.

The major technology firms are already striving to create headgear that don't require cords and allow for HD visual viewing. Virtual reality headsets with 8K resolution and even more potent processors are currently being developed. Even the possibility of integrating artificial intelligence within the following few years is being discussed. The most recent 5G standard may potentially offer some pretty intriguing VR development situations. More gadgets and sizable user populations will be able to connect thanks to this standard. Customers will be able to receive photos in real time, virtually as if they were seeing them with their own eyes, because to its nearly undetectable latency.

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