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Using 3D Animation and Virtual Reality in Educations

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Abstract. This paper will look at the use of innovative and advanced technology teaching methods to support the goal of learning enhancement by using established teaching concepts. The primary aim is to explore the potential for using leading-edge virtual reality technology to help students learn and understand various concepts. The utility of the technology was examined by studying the latest 3D programming tools. Additionally, there were several styles of animation used. The results showed that Virtual Reality technologies can play a role in education and learning when supported by established learning and teaching concepts.

Keywords. 3D Animation, Virtual Reality, Future of Learning and Education, Animation Technology

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1.0. Introduction:

Virtual reality is a computer-generated environment, which a person can connect by using a particular electronic device.

Virtual reality (VR) states the practice of computer graphics organization in arrangement using several displays with interface devices to deliver the upshot of involvement

in the collaborative 3D computer-generated environs [1]. E-learning applies the internet like a display place for knowledge activities, containing virtual interfaces between learners and instructors or three-dimensional settings, aggravating the learning modes [2].

As stated by Howard [3], "virtual reality is an imaginary world that can be accessed via technology." VR has been used as an education tool in applied fields for some time, like in aeronautics and medical visualising, plus it has been practised in schools and other institutions in recent years [4].

Rashid depicts [5] the current improvement in peculiar calculating, and the internet has created many software gears for the relaxed and applied progress of web pages and graphics and visualisation apparatuses. VR and computer graphics modules entail devices and tools for forming virtual entities and scenes that trigger natural systems and backgrounds. One facet of virtual reality software design languages is their capacity to simulate physical coordination on a computer presentation. Today, it is probable to demonstrate intricate, exclusive, or dangerous systems without harm and thriftily on a computer display.

Learners will participate in the learning materials via virtual reality, which will play a significant role in future multimedia systems. Virtual reality can benefit from 3D gene modelling, physics experiments, surgical procedures, and trips to terrestrial and celestial landscapes.

Virtual reality enables us to enter and interact with a world that is not accessible in real life or is too expensive or dangerous to reach. A virtual environment is created on a computer to practice or test knowledge, and human interaction is possible. When compared to physical models, 3D virtual reality images are more dynamic. In circumstances where:

It is difficult or impossible to access the actual object or environment.

Using these natural objects is dangerous for the consumer or could pose a health risk.

The expense of getting and experimenting with the actual object is a problem.

The real-world benefits of virtual reality models are immense for applications in scenarios where using animal organs is impractical or prohibited. The mad cow disease, a bovine spongiform encephalopathy, is a problem that arises with using animal brains for dissection experiments. The efficacy of virtual reality as a training and knowledge tool is reflected in this paper.

Students can experience immersive 3D environments with VR, making them feel like they are actually in another place. It can be connected in all areas of teaching and learning with low-cost applications, combining with various pedagogical and stylistic approaches to education. In doing so, students become the main actors in their learning process. For that reason, it has become a vital tool to be used in various fields such as science, geography, heritage, art, and culture because it provides a unique setting that stimulates interest and encourages creativity.

1.1. Background:

Since the 1960s, with the advancement of computer-aided design (CAD), 3D animation has been broadly practised in the motion picture, manufacture, and gaming industries. As of virtual reality (VR) to augmented reality (AR) tools, 3D animation helps like a dynamic mode for creating visual content. In response to commercial and market necessities, 3D animation processes have industrialised a core competence necessary of beginners and students in linked fields. Software for creating 3D animation functions exceptionally complex features, resulting in an abrupt education turn for learners; hence, processes for surging the education drive of learners is essential [6].

The prompt education situation and learner concentration are the most critical aspects that affect early learning performance [7]. Accepting how to utilise VR to invite student attention is vital for instructing 3D animation [6]. Neo and Neo [8] declared that the usage of audio-visual aid skills is an advanced and operational training approach that inspires education and aids learners to advance remarkable problem-solving skills.

1.1.1. Types of VR:

There are 3 main categories of VR:

Immersive: This is a lifelike virtual reality. It's like being present in a virtual world. The operator of the VR device is surrounded by pictures, audio, or other effects. Immersion occurs when the virtual world appears realistic, credible, and believes he is actually in it [9].

Non-Immersive: According to Robertson [10], immersive VR is not the only type of VR. They define non-immersive VR as "a 3D world controlled physically, but with a screen, a mouse, and a keyboard." Non-immersive VR uses computer-generated simulations but lacks immersion [11]

Semi-immersive: This type of virtual reality allows people to interact with a virtual environment that is only partially real. Some use virtual reality to play games, while others use interactive computing and projection technology to learn. The simulated operating room tools and screens are fundamental in this situation. Keep in mind that this type of VR immerses the user in a new environment [12].

The original concept of virtual reality, referred to as immersive virtual reality, is used for multiple purposes, but the usage is still the same. Virtual reality with total immersion had been conceived as early as the late 1980s. Immersive VR lets consumers involve with a virtual atmosphere that has been entirely programmed to reflect reality. The environment is a full-scale replica of the natural world, as suggested [13], and it relates to human size. The subjects, thus, get the sensation of communicating with the natural environment or person. There are real and abstract virtual reality applications, each of which immerses users in its world. Situations like these are:

- Medical students can interact with virtual patients and practice various surgical procedures.
- Easypano, for example, allows architects to take their clients on a virtual tour of the dream home designed.
- You don't have to be in the same place or interact with the same things to be part of a team; you can do both. They can see and interact with each other in the form of virtual humans.

2.0. Research Aim:

The potential of VR and 3D animation to be a valuable educational tool is a question that warrants further exploration. Resultantly, this Research study intent to investigate the scientific literature on VR and its role in education and learning (HE). This study, with its qualitative research methodology, explores that how VR existed in many forms in learning, how VR learning gives 3D insights into functions and structure of a system, its effectiveness in learning, the applications and developments in VR and 3-D animation technology, and the challenges while VR learning and its provisions.

3.0. Research Objectives:

Throughout the twenty-first century, advances in digital technology have transformed education systems around the world. Virtual reality has become increasingly prevalent in the

education system, much like other innovative technologies. Countries in which VR is already being used in the education system have already been developed. In contrast, developing countries need to make great strides in implementing VR into their education systems. The goals of this writing project are as follows:

- Dissemination of virtual reality and its benefits.
- This fantastic technology shows the origins of the world's most effective learning methods.
- Evaluating virtual reality in education and training
- Concluding that this technology could help transform education.

To achieve the above four main objectives, the first step will discuss virtual reality technology and its applications. Additionally, the educational benefits of virtual reality are explored, and it is noted that the use of VR has wholly changed how education systems operate around the world. The application of this technology is especially recommended for use in all countries, both developed and developing.

4.0. Research Questions:

Following are some research questions that will form the basis for other research processes regarding 3D animation and VR technology used in learning environments.

R1: Why using 3D animation and virtual reality in learning is essential?

R2: How educational systems have developed by using 3D and Virtual Reality (VR) technologies?

R3: Why developing countries must use 3D and VR technologies to improve learning?

R4: Is the Virtual Learning environment better than the Traditional learning system?

5.0. Research Hypotheses:

Through qualitative and quantitative research, the following will be the determining hypotheses;

The relation between student satisfaction and usage of 3D animation and VR.

A strong relationship with success and VR 3D learning against traditional ways.

VR tools are accessible, affordable and inspiring in learning.

6.0. Literature review:

6.1. History of VR:

The practice of visual tools for education and learning in industrialised education has formed dramatic additions of the formerly traditional discourses, demonstrations, and pro-active experiences [14]. Lanier coined the term "virtual reality" in the mid-1980s [15]. Heilig designed the enormous booth-like device named the Sensorama [16]. Sensorama was a prototype device envisioned to give some persons the impression of being in a completely 3D immersive domain. As a "virtual world window," Sutherland proposed the "Ultimate Display" in 1965 [17]. Aspen Film Map, MIT 1978, a VR rotation on Google Street Outlook, with DARPA assistance [18].

Innovating scientists and engineers over the last 60 years have set the platform for low-budget, high-grade products. Sega first developed a VR headset in 1990 as an upgrade for Genesis [19]. Z-A Production created the SAS Cube on PCs in 2001 [20]. By 2018, at least 300 companies were developing VR technologies.

6.2. Theatrical Background:

6.2.1. Aptitude-by-treatment interaction:

Aptitude-by-treatment interaction (ATI) investigation denotes the notion that educational approaches are further active when they are enhanced to the certain aptitudes and features of the beginner apprentices [21] [22] [23]. Ausburn and Ausburn [14] have titled the usage of the ATI exemplary in novel readings in Virtual Reality in learning [23].

6.2.2. Spatial Ability and VR:

Three-dimensional ability denotes a set of intellectual aspects and abilities vital in deciphering problems that include employing and handling visual-spatial info [24]. It is supposed that spatial conception ability is the crucial intellectual aspect that roots the variances in the act and affects the conception of 3-D computer animation and VR [25]. Learners with unlike spatial ability will advantage otherwise when education with collaborative 3-D simulation or imitations [25] [26], which rest on their aptitude to extract pertinent material and renovate or integrate the material interested in their prevailing intellectual simulations. The research of Merchant et al. [27] stated that spatial alignment arbitrates the interactions amid the 3-D virtual education atmosphere and chemistry instruction effects. Lee, Wong, and Fung [28] have investigated that regulated and dynamic education in a Virtual Reality learning circumstances is essential for great 3-D ability students. High three-dimensional ability students are further prone to make enhanced, with an advanced level of apparent education and gratification if device and dynamic education is delivered. That is why 3d animation and VR tools may not work for everybody similarly regarding three-dimensional ability. This was mentioned in the hypotheses as well and will be further enunciated through the quantitative methodology.

6.2.3. Interaction influence of spatial ability and learning strategy:

While relating the act of high and low three-dimensional ability students amid a desktop Virtual Reality education atmosphere and a knowledge setting without collaborating three-dimensional visualisation, the aptitude as compensator premise suggests that small 3-D ability beginners advantage maximum after the VR centred education atmosphere as they have trouble to restructure their imagination [25] [29] intellectually. It refers to that extraordinary spatial ability reimburses the non-interactive three-dimensional education atmosphere. Nonetheless, high-level apprentices do not advance specific benefits as they can construct their visual depiction built on fixed imageries and words only [29]. Instead, constructed on the aptitude as accompaniment premise, great spatial ability must help mainly from the VR centred learning atmosphere as they have adequate intellectual competence remained for rational ideal formation [29] [25]. As per the small spatial ability beginners, they don't increase specific welfares since the knowledge in the Virtual Reality based education atmosphere needs intellectual ability that surpasses the accessible remembrance resources [23].

6.2.4. Cognitive Load Theory (CLT):

Cognitive load theory (CLT) terms as an educational notion instituted on our consciousness of human intellectual physical design that explicitly speaks the boundaries of working retention [28] [30]. It has been increasingly accustomed to appraise the educational plan and envisage knowledge efficiency with innovative tools [31]. The procedure of education needs working memory to be vigorously affianced in the conception of instruction material.

6.3. Elements of VR:

Video games allow for sensory input. Indoor VR environments, like virtual reality, provide a sensory experience. Faces, items, voices, comments, and movements are replicated to simulate the real world while isolating the person. This approach also gives the user the sensation of being somewhere else with additional graphical presentations and other methods. To create a virtual reality, we need two fundamental elements:

- Human-computer interference
- High-tech computer

Hardware devices necessary to set up these environments include:

Sensors: To create a Virtual environment's delusion.

Effectors: Delivering what is needed.

Connecting Hardware: It is used to connect effectors and sensors.

Every environment in this class affects the human senses and delivers feedback by many devices that work in cooperation with input sensors. These environments look just like the real world. The hardware is used to design and connect applications to examine a person's shape, objects, and virtual interactions.

6.4. Types of animation learning:

For instructional purposes, a wide variety of animation styles can be used, including:

2-D animation: This animation method shows movement by flashing a series of images or frames that are just slightly different from others.

3-D animation: Creating objects that move with 3-D wireframes. Algorithms can rotate and move the objects in time.

Motion graphics: It refers to the movement of graphical elements and text across the screen. The content we create is determined by our authoring and presentation software.

Transformations: depictions of alterations (such as red cheeks or a thickening line) without motion

Stop-motion animation: The illusion of movement created by photographing an object and moving it slowly.

6.5. Virtual Reality devices and environments:

MIDI output provides both visual and audio feedback. The four most common VR devices and environments are:

Cave: A cave is a large room with three large walls [32]. The roof can also be the ceiling and floor. Other virtual reality environments simply cannot achieve such a wide field of view. This small room allows people to move around freely without requiring a computer. Only 3D glasses are required [33].

Head-Mounted: You've probably seen the head-mounted display (HMD) in science fiction shows and, on the internet, where you may have even researched the subject. An HMD, or virtual reality headset, is commonly referred to as VR glass [34]. They're also called VR headsets. Because the headset is directly connected to the head, images can be shown to the eyes, along with peripheral vision. Any device that meets the above criteria is a head-mounted display.

Magnetic trackers are a popular choice among virtual reality environments to provide immersive capabilities [35]. Many new technologies are being implemented to keep up with the demand for VR tracking devices. Motion tracking systems use a transmission device to send data to a computer, tracking the system's movement.

Haptic Gloves: It's a new virtual reality glove called Haptic Gloves. Virtual gloves are used to simulate touching and manipulating virtual objects. The gloves use microfluidics and motion technologies. When virtual reality simulates haptic gloves, users can feel objects' weight, magnitude, impact, and warmth [36].

6.6. Applications of virtual reality and 3-D animation:

A variety of practical virtual reality applications exist; several of them are detailed below.

Business: Virtual reality is utilised by the business industry for business location virtual tours. Training new workers can be made easier using virtual reality technology. Through virtual reality, customers can inspect the merchandise at 360 degrees [37].

Medical field: In the medical field, VR can significantly improve and enhance existing systems [38]. Physicians can perform basic medical tasks in far-flung places across the globe thanks to Virtual Reality tools. Medics may practise three-dimensional body simulations made after clinical scanning statistics to help them make more accurate medical plans and carry them out more effectively. It is also possible to educate the client and his family on the problem with 3D models. Välimäki [39] also argued that VR can assist people with mental illness due to its therapeutic potential.

Military: Virtual reality has helped armies train by simulating various scenarios. With VR, a student can practice fighting, medical, and driving skills in various scenarios. The military's use of VR reduces training costs. It also helps in potentially dangerous situations [40]

Vehicle production: Ford, a giant automaker, has already adopted virtual reality [41]. Engineers from all proposed vehicles can share module information in virtual reality, allowing them to make critical decisions before the vehicles are built. The engine is assembled if all engineers approve the virtual prototype. It saves time, energy, and money.

Industry of entertainment: Customers are always fascinated by modernisation in the entertainment industry, worth billions. In 1982, the film Tron popularised virtual reality gaming [42]. In today's games, an avatar lives in a complex virtual world. Virtual reality allows users to explore their surroundings freely. Movie actors try to imitate real-life events as closely as possible [43].

Stimulator of flight: Pilots train in flight simulators, and VR is now a practical option. Flying the plane simulator provides the trainee with a flying experience, and he feels like he is flying a plane. Before they can fly on a plane, pilots must pass several tests in a flight simulator. It removes the possibility of a disaster. Virtual reality has several first-generation applications, including flight simulation [44]

Education: Virtual reality can drastically improve the educational system [45]. In the virtual world, students can talk with each other and interact with a 3D environment. Students may also engage in simulated field trips, for example, visiting parks, the solar system, and various periods. This paper explains the part of VR and three-dimensional animation in instruction in detail.

Sports: The players and fans both are thrilled about the current innovations in VR technology. Virtual reality has many applications in sports, from training support to athlete assessment. With sporting events being shown on media screens, the VR experience is elevating the viewer's experience. Certain media companies now provide viewers with a VR-enabled live-streaming service, and the tickets for the events are purchased for virtual spectating [46].

Special education: Studies have shown that virtual reality and 3D animation help autistic children develop cognitive, communicative, and behavioural skills [47]. The quickest method to trail ASD action is through daily human calculating actions using Virtual Reality.

E.g., Ip [48] developed a virtual communication framework to help ASD children socially and emotionally.

This application includes six specific learning scenarios: intellectual organisation and motivation, social frameworks, convergence assistance, and generalisation. The software was established with analysis strategies in notice. VR and 3D animation can create a fun social experience for patients receiving high-quality physiotherapy. Despite their high costs, some physiotherapy models are effective. It increases the demand for low-cost alternatives.

6.7. Literature Gaps and supposition:

Gaps in the gathered fact are absent fragments or insufficient evidence in the search workings. Yet, some aspects are clarified through the literature review. These are areas that have the prospect for further investigation for the purpose that they are unmapped, unknown, or outdated. This part of the research study has clarified many points regarding the usage of 3D animation and virtual reality in learning.

The literature review has not adequately evaluated the approachability and accessibility of VR technology and devices in Learning environments. Further, the generation gap between the traditional learning methods and modern learning through 3-D animation and VR is not well explained in the literature review. The relationship between the VR learning environment and the satisfaction of the student is not well described. The importance and acceptance in developing countries are not well demonstrated through the literature review.

The further quantitative analysis of the survey questionnaire will enunciate the results in more clarity to the research questions and hypotheses.

7.0. Methodology and Data:

7.1. Survey:

An empirical study was designed as a survey for evaluating and finding the literature gaps. Contributors for this research study were contacted via personal contacts, social platforms placement, and posting in corresponding groups in LinkedIn and Facebook proficient linkages. The survey was based on the subject matter: using 3D animation and virtual reality in learning.

This survey was done randomly, among various people from different niches, parts of the world, and age groups. The age group chosen was under 18 and above. A 20 questions survey questionnaire was based on queries related to demographic details and knowledge about VR and 3d animation in learning. It also gathered the information for its status in Developed and under-developed countries and comparing traditional and Virtual learning. It has also collected people's thoughts about why developing countries need to opt for this technology in learning. It has also gathered participants' opinions regarding the accessibility and approachability of 3D animation and VR in learning and the satisfaction a beginner or learner gets to achieve from this technology.

The survey was conducted in the period of 28 September-03 October 2021.

7.2. Data analysis:

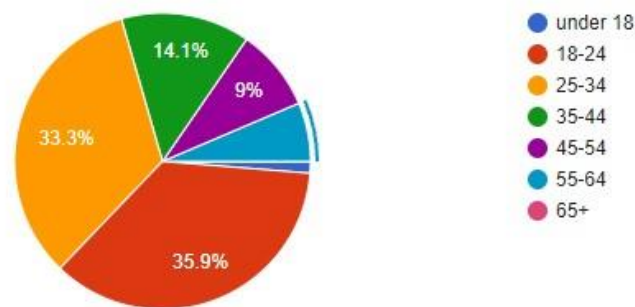
A total of 78 respondents took part in the survey. There was no age limit for the respondents, and they were from different places all over the world. Following are the findings from the questionnaire that had been found from the survey circulated.

- I. This research study was not defined to a specific group: This research was done to anticipate and acknowledge the research questions and hypotheses concerning the use of three-dimensional animation and VR in education. Here the age group was not

determined. It was found that 35.9% of the respondents were from the age group of 18-24. 33.5% was from the age group of 25-34. 14.11% were found to be 35-44 years of age. The rest were 45-54, constituting 9%, 6.4% of 55-64 age and 1.3%, constituting age less than 18. So the majority of the respondents belonged to 18-34 years of age. It was evident that adult suffrage was high in number.

What is your Age?

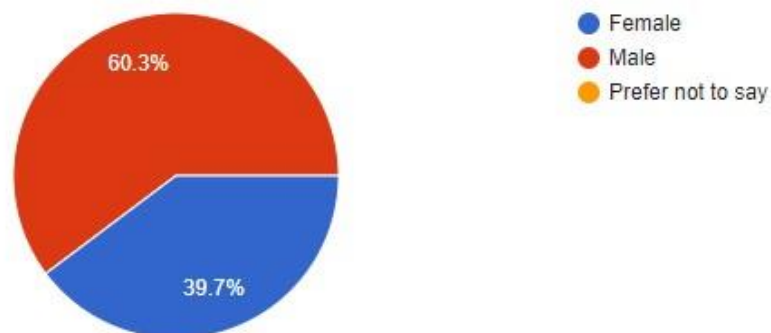
78 responses



- II. Among the respondents who participated in the survey, 60.3% were males, while 39.7% were females. Gender inclinations also had an influence, but more or less was not an eminent factor. More male respondents took part in the survey. However, the percentage of females was relatively more minor.

What is your gender?

78 responses



- III. The survey was kept general to know people's thoughts from different areas about VR in learning environments. So people from different countries took part in the survey with their knowledge and perceptions about the technology around them.

which of the following describes your occupation the best?

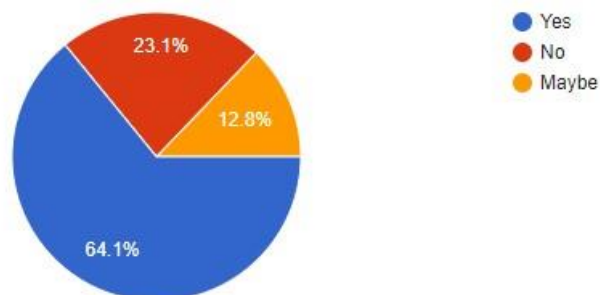
78 responses



VI. The response was about the subject topic of VR and its application in learning. Participants were asked about their familiarity with 3D animation and VR technology in learning: 64.1% were familiar with the virtual reality technology. 23.1% were not familiar with this technology. At the same time, 12.8% were uncertain in this matter.

Are you familiar with 3-D animation and VR?

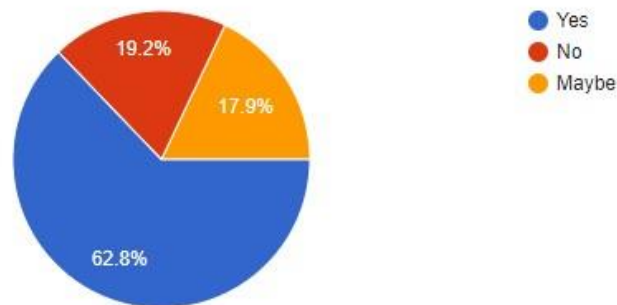
78 responses



VII. 62.85 of the respondents think that virtual reality and 3D animation technology in Approachable and accessible. While 19.2% said it is not accessible and approachable: were 17.9% showed uncertainty in this matter.

Virtual reality is a computer-generated environment, which a person can connect to using a special electronic device. Do you think it is approachable and accessible?

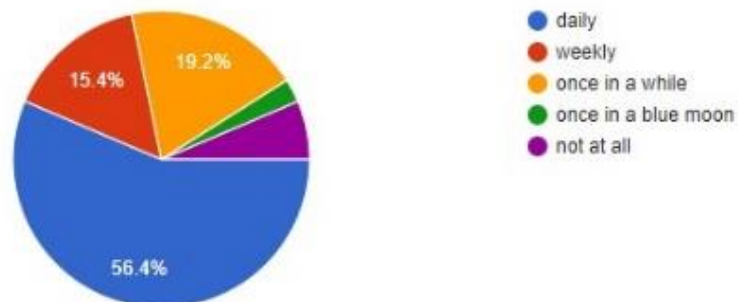
78 responses



VIII. Well, to stay in touch with contemporary advancements, one should be in connection with it. 56.4% of the respondents stated that they use the devices and technology daily for learning purposes. While 15.4% said, they use it weekly. 19.2% said that they use it once in a while. While 6.4% said they do not use it at all and 2.6% said they use it once in a blue moon.

How often do you use devices for learning and educational purposes?

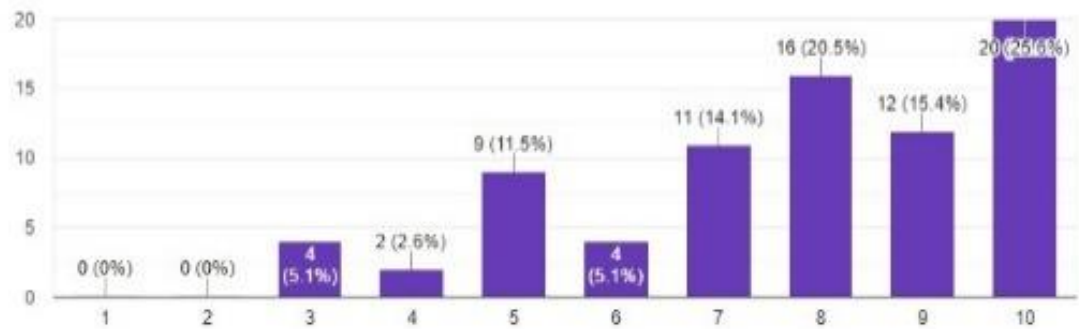
78 responses



IX. Respondents were asked about their viewpoints on how helpful the Virtual reality learning environment could be for beginners. Most of the participants rated it high, as they considered it helpful for beginners in their learning.

How much do you think that virtual Reality learning environment be helpful, especially for beginners?

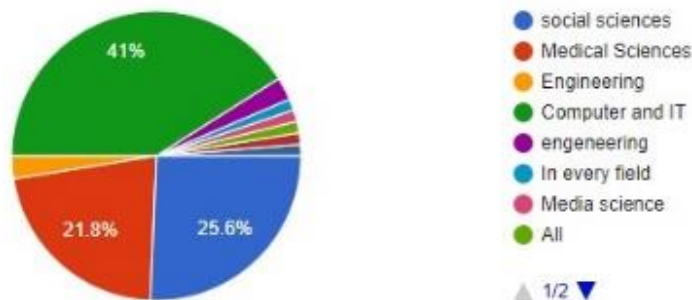
78 responses



- X. Respondents said if they were in the learning phase or wanted the 3D animation and VR in some area of study: 41% would be Computer and IT. While 25.6% said in social sciences, it could be very much beneficial. 21.8% voted for medical sciences. 2.6% said it could be engineering, while the rest said in almost every field, including Media and communication.

If you are a student, then from which field of education you are or prefer to be in where VR technology can be used?

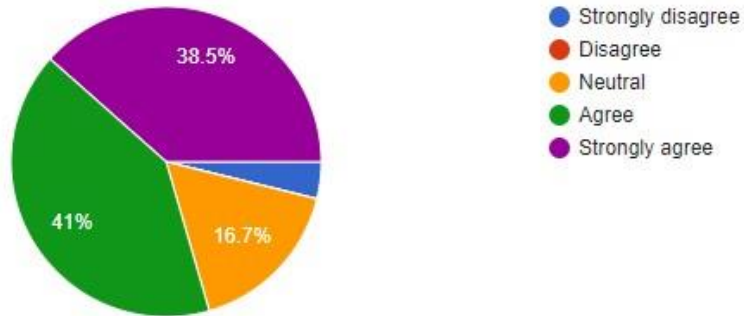
78 responses



- XI. 41% and 38.5% agreed and strongly agreed that 3D animation and VR could be helpful tools in learning. At the same time, 16.7% showed a neutral response.

Can VR and 3D animation be a useful educational tool?

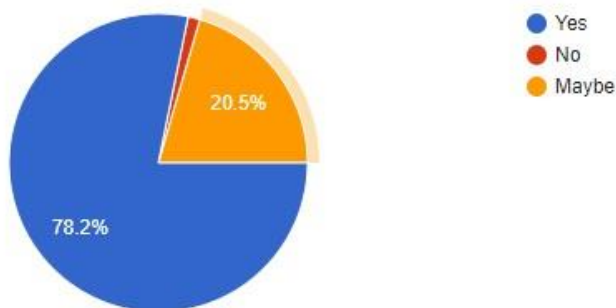
78 responses



XII. A very few said No. 78.2% of the respondents considered that 3D animation and VR learning environments could make the learning more effective and affluent. 20.5% showed a neutral response.

Do you think 3d and VR learning environment can make the learning more effective and affluent?

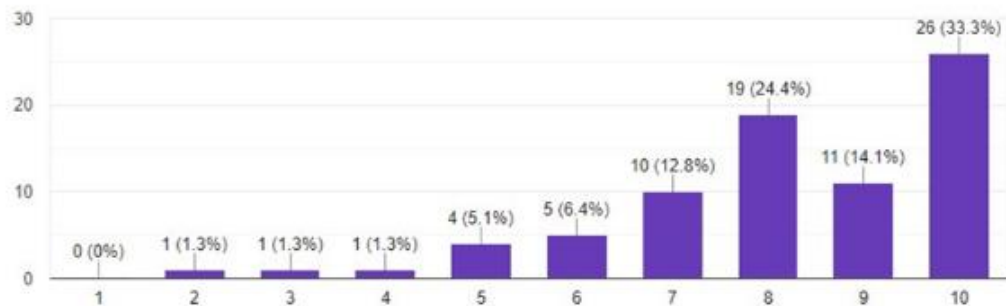
78 responses



XIII. The majority of the respondents rated high for that VR technology makes things easy to understand in learning.

Does VR technology makes things easier to understand?

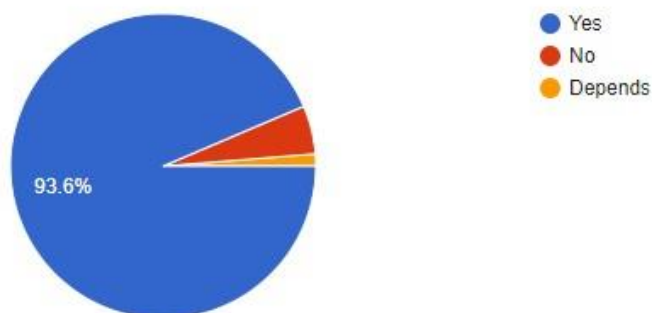
78 responses



XIV. The learner's satisfaction is also one of the primary aspects of adopting and using 3D animation and VR in learning. 93.6% said that it could satisfy a learner need in the learning process. The rest said maybe or no, but the majority showed a positive response.

Can it satisfy a student's or learner's need?

78 responses



XV. It was asked why 3D animation and VR learning environments could be substantial, and the following were the responses obtained.

Why 3D animation and VR learning environment can be important?

78 responses

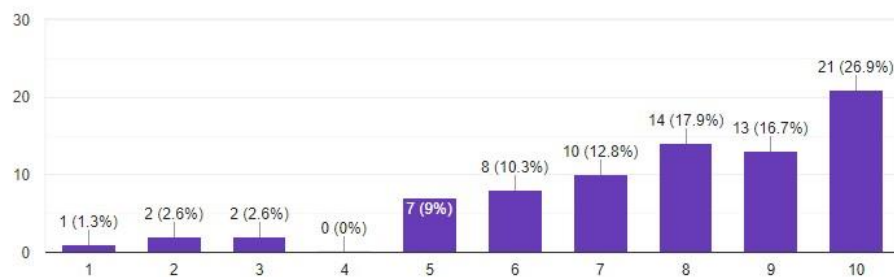


XVI. The majority of the respondents voted high because they considered VR learning environments better than traditional learning environments. It can help to understand and learn things better than traditional ways, such as we can communicate our idea through animation videos which help people to understand in a better way than reading. Maybe while listening only or reading only, the idea cannot be understood well than animation videos. We can accurately share our perspectives.

How much do you think VR learning environment can be better than Traditional learning environments?



78 responses

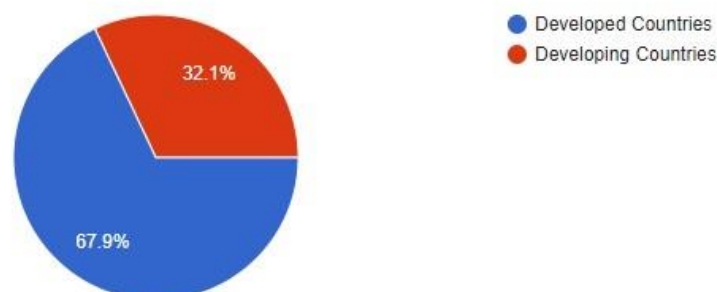


XVII. For being better in developed countries, most respondents responded the facilities, advancements, excellent IT development, technological development and resourcefulness in their countries are better. 67.9% stated that 3D animation and VR technology is better in Developed countries, whereas only 32.1% voted in favour of developing countries. One of the respondents said that it would create a more fun way to adapt and inculcate the learning in a better way through a fun mode other than a traditional setup.

Respondents considered that time is the main reason. We can save massive time by choosing 3d, and VR methods of learning; as a medical student out concern revolves around the human body, so yeah, 3d imaging will be a great way to understand the complexities of the human body.

Where do you think 3D animation and VR learning systems are better?

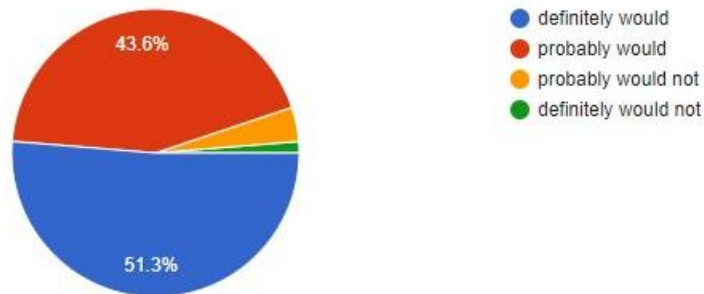
78 responses



- XVIII. 51.3% and 43.6% consider that VR technology definitely would and probably would help the developing countries excel in development and advancements.

How much do you think the future of VR Learning environments in developing countries would excel?

78 responses



- XIX. Lastly, respondents were asked about why 3D animation and VR could be the need in developing countries. Their primary responsibility was to cope up with the advancement and development. They said, "it makes them have a passion for discovering more types of science and applications related to these technologies in the field of education in all disciplines. It leads to the emergence of generations of advanced students in the education of all age groups and various specialisations". As it is the innovation. In developing countries, it would help everyone to enhance their knowledge. Regarding its importance, they also said, "Yes, it should be used, but we cannot dispense with traditional education. This type of technology gives the learner a sense of responsibility towards learning, despite the distance learning in which there is a lot of recklessness". It can also help to reach students who are pretty away from institutions and technologies. They can easily approach equipment's and learn to operate them more effectively. Respondents also said that students could not have the tools and machines to see innovative products visually. Viewing it in VR or 3d would be better than watching it on regular 2D screens. It is also helpful in diversifying the skills and aptitude to compete with the developed countries.

7.3. Limitations and future concerns:

This research study revolves around two methods, i.e., literature review and survey. Unfortunately, the survey regarding 3D animation and VR application in a learning environment had very few respondents who participated in the survey.

Nearly most of the empirical studies have some limits. In most survey-based studies, one is inhibited by the length of the investigation. Here in this research, the sample size is small, which has affected the results and outcomes of the empirical study. A sample size that's extra small decreases the supremacy of the research and surges the edge of fault, which can reduce the study pointlessly. As in this study, the researcher had to constrain a small sample size which caused a less probable result.

Further future research studies on this subject matter should entail a larger sample size for the best probability of study results. As the empirical studies are time-consuming, thus with full time and concentration can resolve limitations. Moreover, ethical considerations play an essential role. People do not always give consent for sharing their details. So in the future, the

researcher must consider the issue of consent effectively. Make and assure the people to believe in the research and its purposes.

8.0. Discussion and conclusion:

From the above data analysis, it is evident that respondents are ready to accept this technological advancement. Moreover, people consider 3D animation and VR in learning to be way better than traditional learning systems. Those who are out of areas can access learning environments quite quickly. Moreover, student satisfaction is one of the primary concerns, can be achieved through using this technology in learning environments. Moreover, the advancements and developments in the developing countries are the main reason they are better there. While developing countries should adopt this to make themselves self-sufficient. It is way better than traditional learning systems. Visual learning is very effective, and we don't have to cram everything; it will help us understand more profoundly and effectively. As practical learning is always more preferable to just remembering or memorising things. Online classes are the most prominent example in today's world. Nothing is practical. Students are passing without any learning, idea or concept or visual understanding of the topics, which will undoubtedly affect them soon.

Many countries have already adopted virtualisation to aid education. Even if it is difficult to comprehend how virtual reality will improve education, it will be an essential component. Education administrators struggle with this issue because it necessitates incremental progress. Our research shows that virtual reality has many advantages. New technologies have made animation more affordable and accessible, making it a viable option for instruction. Based on the evidence gathered by researchers, a set of design principles is emerging.

Choosing to use animation format before doing research is something to consider. The animations will finally achieve their learning potential. Because of the many technologies in the virtual reality industry, there are undeniable benefits; virtual reality is much more affordable and interactive than traditional learning methods, and education becomes more practical and rooted in students' lives. It's generally safer for learners to learn via virtual training and demonstration than to get live training, so it reduces the risk of injury and wastes money. It only requires a smartphone and a web connection to work, which provides instant benefits.

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