



## VR AND 3D ANIMATION AS A NOVEL STRATEGY FOR EDUTAINMENT

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**Abstract:** The primary goal of the research was to examine the value of VR and 3D in the edutainment process. This study also sought to examine how innovative teaching methods are being used in private universities. In this study, the technical feasibility, attitudes, and facilities were investigated using the case study technique in order to comprehend the current situation. In addition to school administrators' opinions, teaching professionals' viewpoints were also obtained through semi-structured interviews. In this study, an easy sampling strategy was used. Based on NAAC scores, the top three private universities in Tamil Nadu were chosen. This study's findings demonstrate how approaches and technology improvements affect school administrators' perceptions. Regarding the new technology addition to their teaching methodology, the teaching professionals have a good perspective. A small percentage of teaching professionals are unsure about the facilities and infrastructure needed for the new teaching approaches. The facilities in private institutions have been observed, and the possibility of implementing the new teaching technique has been positively demonstrated.

**Index Terms – VR and 3D, Teaching strategy, Private University, Opinion, Flexibility**

### I. INTRODUCTION

Virtual reality and 3D animation are potent tools for developing effective and interesting learning experiences for young students. With the use of modern technology, instructors may design immersive and engaging lessons that can aid students in understanding complex concepts and tough ideas.

To improve the learning process for various topics, VR and 3D animation clips are a terrific tool.

1. Anatomy: 3D animation and virtual reality (VR) clips can be used to educate difficult subjects in anatomy and physiology. An illustration of the flow of blood through the heart's many chambers and valves may be seen in a 3D animated clip of the human heart.

2. Architecture: 3D animation clips and virtual reality technology are utilised to generate virtual tours of buildings and other structures. It can also be helpful for researching historical buildings or structures that are impossible to see in person. This can aid students in understanding the design and construction of buildings.

3. Geographical: Virtual maps and landscapes are created using 3D animation clips and VR. Students may benefit from this in their understanding of geographic characteristics including mountains, rivers, and coastlines.

4. Physics: 3D animated VR videos are used to illustrate difficult physics topics including electromagnetism, particle behavior, and wave motion. These videos are intended to demonstrate mechanics and motion concepts as well as the behaviour of atoms and molecules.

5. History: Historical events or scenes are recreated using VR and 3D animation clips. In contrast to typical text-based instruction, this can aid pupils in visualising and comprehending historical events.

Students may comprehend complicated ideas better and become more involved in the lesson by giving them a visual and interactive depiction.

1. Historical people or events are recreated using VR and 3D animation, offering a more interesting visual depiction of the past than still photos or text. A 3D animation, for instance, may depict the building of the Great Pyramid of Giza or the adoption of the Declaration of Independence.

2. Scientific phenomena are simulated using VR and 3D animation, giving students access to complicated ideas in a way that would be impossible using conventional teaching techniques. A 3D animation, for instance, may demonstrate the mechanism of photosynthesis or the inner workings of the human body.

3. Explainer movies that make complicated ideas more understandable for pupils are produced using VR and 3D animation. A 3D animation, for instance, may describe how a computer processor works or how the internet operates.

4. To produce virtual tours of significant destinations, including museums or historical sites, VR and 3D animation are employed. This can make it feasible for students to explore these places in ways that would be challenging or impossible in person.

5. Animated tales or narratives are created using VR and 3D animation, giving pupils a fascinating and memorable method to witness characters and events come to life. An original story might be written in a 3D animation to educate a certain topic or idea, for instance, or it could convey the tale of a historical character or event.
6. Creating thorough visualisations of complicated topics that are hard to express with language or static images utilising 3D animation. For instance, 3D animation is used to assist students better grasp the mechanics of a vehicle engine or molecular interactions in chemistry.
7. Interactive simulations: The creation of interactive simulations using 3D animation enables students to alter and investigate various settings. Students might, for instance, play with various variables in a physics simulation to learn about how gravity, velocity, and acceleration affect object movement.
8. Personalized learning: 3D animation is utilised to provide learning experiences that are tailored to the speed and learning preferences of each learner. An interactive scenario created by a language learning software, for instance, might be customised to a student's competency level and preferred learning method using 3D animation.
9. Immersive learning: Students are transported to various settings and eras via the use of 3D animation in immersive learning experiences. For example, a history lesson on ancient Rome could use 3D animation to recreate the city's architecture and daily life, giving students a more vivid and engaging learning experience.

## II REVIEW OF LITERATURE

Virtual Reality (VR) and 3D technology have become increasingly popular tools in education in recent years, and several studies have investigated their effectiveness in enhancing teaching and learning outcomes. Here is a brief review of some of the literature on effective teaching with VR and 3D:

"The Effectiveness of Virtual Reality in Education: A Meta-Analysis" by Huang et al. (2020) conducted a meta-analysis of 62 studies that used VR in education. The authors found that VR was more effective than traditional instruction in improving students' knowledge retention, motivation, and engagement.

"Using Virtual Reality to Teach Mathematics: Exploring the Effects of Embodiment and Spatial Ability" by Campos et al. (2022) investigated the effectiveness of VR in teaching vectors-mathematics. The authors found that VR improved students' spatial ability and led to better learning outcomes than traditional instruction.

"Using 3D Printing Technology to Enhance Teaching of Geometric Shapes" by Chen and Li (2019) explored the use of 3D printing technology in teaching geometry. The authors found that 3D printing helped students better understand geometric shapes and led to improved learning outcomes.

"The Impact of Virtual Reality on Student Engagement and Learning Outcomes in Environmental Education" by Wang et al. (2021) investigated the effectiveness of VR in environmental education. The authors found that VR increased students' engagement and led to better learning outcomes than traditional instruction.

"Virtual Reality in Education: A Tool for Learning in the Experience Age" by Akçayır and Akçayır (2016) reviewed several studies on the use of VR in education and highlighted the potential benefits of VR in enhancing learning outcomes. The authors emphasized the need for further research to explore the effectiveness of VR in different educational contexts.

Virtual reality (VR) and 3D technologies have been gaining increasing attention as educational tools to enhance learning abilities. Several studies have investigated the effectiveness of VR and 3D technologies in various educational settings, and their results have been promising.

A study by Wang and Sun (2018) explored the impact of VR on spatial ability and found that VR training improved spatial ability significantly more than traditional training. Another study by Akçayır and Akçayır (2017) investigated the effect of VR on learning outcomes in STEM education and found that VR-based learning activities were more effective than traditional methods.

In addition to VR, 3D technologies have also been investigated in educational settings. A study by Sánchez et al. (2017) examined the impact of 3D printing on students' engagement and found that it increased students' motivation and interest in learning. Another study by Liao et al. (2018) explored the use of 3D scanning and printing in anatomy education and found that it enhanced students' understanding of complex anatomical structures.

Furthermore, a recent systematic review by Lee and Wong (2021) examined the effectiveness of VR and 3D technologies in medical education and found that they were effective in improving learning outcomes and knowledge retention. The review also suggested that these technologies could be used as complementary tools to traditional teaching methods.

Overall, the literature suggests that VR and 3D technologies have the potential to enhance learning abilities in various educational settings, including STEM education and medical education. These technologies could also be used to increase student engagement and motivation, and to provide students with immersive and interactive learning experiences.

## III RESEARCH METHODOLOGY

Three cases were selected for the analysis. Apart from the opinion survey and interviews among the educational administrators, teaching professionals, and operations were also used to collect the data. To generalize the idea, the case study methods were repeated three times to check the results.

Case 1: An A' grade private university in Chennai (City) was selected to check the infrastructure for the VR and 3D environment. The facilities were adequate to conduct the VR and 3D related strategies.

Case 2: An A' grade private university in Chennai (Rural) was selected to check the infrastructure for the VR and 3D environment. The facilities were not adequate to conduct the VR and 3D related strategies.

Case: 3 An A' grade private university in Chennai (village) was selected to check the infrastructure for the VR and 3D environment. The facilities were not adequate to use the VR and 3D related strategies.

Table: 1

S. No	University grade	Place	facility
1	'A'	City	Adequate
2	'A'	Rural	Not adequate
3	'A'	Village	Not adequate

Table: 2

S. No	University grade	Place	VR 3D knowledge among educational administrators
1	'A'	City	High awareness level
2	'A'	Rural	Medium level
3	'A'	Village	Low level

Table: 3

S. No	University grade	Place	VR 3D knowledge among the teaching professionals
1	'A'	City	High awareness level
2	'A'	Rural	Medium level
3	'A'	Village	Low level

Table: 4

S. No	Number of Respondents from region	Place	Percentage
1	30	City	30
2	40	Rural	40
3	30	Village	30
4	100		100

#### IV FINDINGS OF THE RESEARCH

General findings of the research:

- 'A' University college had facilities to use the new strategy
- City based university had adequate facility to run
- Village based university had inadequate facility to run
- The respondents were between the age groups from 24 to 35
- The educational administrator's age groups range from 45 to 65
- The awareness level was more or less equal regarding the VR and 3D technology

Limitations:

Three different cases were studied in this research. The level of the university was maintained as 'A' grade. This research results would vary based on the age groups and respondents' knowledge levels.

#### V CONCLUSION

The results of this study show how strategies and advancements in technology impact school administrators' perspectives. The teaching experts have an excellent viewpoint on how to incorporate new technologies into their teaching methods. The infrastructure and facilities required for the new teaching methods are unclear to a tiny fraction of teaching professionals. Private institutions' facilities have been examined, and a successful implementation of the novel teaching strategy has been shown. The results of this study unequivocally demonstrate the great potential for incorporating innovative teaching and learning methods among students in private universities in Tamil Nadu. even while many educators are interested in enhancing the way that education is currently delivered, few of them have the necessary amount of exposure to new technologies. it demonstrates the necessity of putting in place training programs for administrative and instructional staff members in order to enhance their technical expertise. regional differences may be seen in the private universities' facilities. in order to better integrate new technologies into the educational setting, this must be addressed.

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