Virtual Reality Technology for Education and Entertainment- Awareness of Pre-service Teachers

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Abstract

Virtual reality is a technology that connects a learner and artificially created conditions. The study aims to assess the awareness of pre-service teachers on virtual reality technology with a self-made questionnaire to measure the Awareness of pre-service teachers on virtual reality. It also tried to find out the utilization of virtual reality. A survey method was conducted at the School of Education, Avinashilingam Institute for Home Science and Higher Education for Women, with a sample size of n=200. Purposive sampling method was embraced in this study. Statistical analysis laid out that from the selected samples, 69.56 percent of pre-service teachers had a awareness, and another 30.4 percent had no awareness of virtual reality technology.

Keywords: Virtual reality technology, Awareness, Pre-service teachers, Education and Entertainment.

Introduction

In the educational field now a day's, technology integration is appreciable. Technology gives many ways to students at all academic levels to do their work correctly in all subjects. Integration of technology into teaching to enhance learning outcomes starts from pre-school itself. Technology is an integral factor in all classroom activities. Every technological invention is adopted in the education field.

In the same way, VR technology is new and arising in the field of education. Already it is used in the field of military (Satava, 1995), medicine and astrology years above. Now VR is slowly entering into the field of education (Christou, 2010). Technology has drastically changed in the field of education from paper and pen to interactive technology aids for interactive learning (Alfalah, 2018). If a teacher wants to teach content with VR technology, they should be aware of that (Fransson et al., 2020). In this study, researchers tried to find out the awareness of the pre-service teachers' on VR technology as they will be teaching the future generation young minds, so they should use different and innovative technology for their teaching(Decock & Cappelle, 2005).

Essential information about the fundamental hardware parts of a computer adds to a comprehension of our digitalized climate. Even though the ideal way to investigate the parts of

a computer may be to fabricate or dismantle a real computer, this can be tedious, risky, and costly (Andreas et al., 2022). The sense of presence is essential if VR experiences (Bystrom et al., 1999) and turn-up technology in education (Kavanagh et al., 2017) have to be researched in parallel to educational purposes. Virtual reality is a technology to enable participants to understand concepts more easily (Javidi, 1999). It provides a different way to see and experience information apart from being used as a tool to develop a model and improve problem-solving skills (McLellan, 1996). VR is a forefront technology that allows learners to move from a standard computer screen to a 3-dimensional interactive environment (Martín-Gutiérrez et al., 2017). Generally, two types of virtual reality technology are available based on the level of interaction and environment (Angelov et al.). The first type, IVR (Immersive Virtual Reality), is based on the head-mounded or immersive environment with display technology. The second type, non-immersive VR, or desktop VR allow participants to interact with computer-generated images (Angelov et al.). The reason for using VR technology in teaching is that the learners can get simulated real world as the digital prototypes (Le et al., 2015). VR environments offer endless repetitions for training and learning purposes and its non-destructive, time and cost-effective method (Badge et al., 2022). VR technology has been used in the educational field to impart concepts and understanding as a teaching and learning aid along with traditional modalities in schools and colleges (Alfalah, 2018). Abdullahi (2020) examined the factors of virtual lab adoption among physics teachers in the Kwara state and established that Physics teachers' perceived usefulness and ease of use of virtual laboratories positively influence the adoption of the virtual laboratory.

Research Questions

1.   Do pre-service teachers' have awareness on VR?

2.   Whether pre-service teachers' are aware of educational and entertainment purpose of VR and whether it depends upon their medium of study, and locality.

Research Hypothesis

The study on different purposes of using VR among pre-service teachers has been conducted by framing the following hypothesis.

•   There is no significant difference between pre-service teachers' Awareness of VR for education and entertainment based on the medium of study, locality and type of school.

Methodology

A total of 200 survey responses were collected with questionnaires from Avinashilingam Institute for Home Science and Higher Education for Women pre-service teachers.

The purposive sampling method is adopted because the study is carried out with the homogeneous group(Etikan, 2016; Queirós, 2017). Quantitative data collected with a self-made questionnaire response were analyzed to identify the various features of virtual reality uses and awareness from pre-service teachers. The tool's reliability was established at r= .8. Additionally, quantitative data were analyzed by calculating descriptive (e.g., totals and percentages) and inferential statistics (e.g., t-test). The survey comprised two parts: demographic information (Section 1) and Pre-service teachers' awareness of VR as an educative and entertainment tool (Section 2).

Participants

In this study, 200 pre-service teachers were selected from School of Education, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. In total, 93% (n= 186) were identified as below 25 years and 7% (n= 14) were above 25 years in the age category. The total participants are categorized based on medium of study (Tamil 31 %(n= 62) and English 69% (n=138)), Based on locality (Rural 45% (90) and Urban 55% (110)) and type of School (Government 53.5% (n=107) and Private 46.5% (n=93)).

Research question 1

1.   Do pre-service teachers' have awareness on VR?

Table 1

Descriptive Analysis

	Frequency		**Percentage**	
Responses	Yes	No	Yes	No
Total	137	63	69.56	30.4

Table 1, shows that 69.56% of pre-service teachers are had awareness on virtual reality technology and its use, 30.4% of pre-service teachers had no awareness on virtual reality.

Research Question 2

2.   Whether pre-service teachers' are aware of educational and entertainment purpose of VR and whether it depends upon their medium of study, and locality.

Table 2

Analysis of the sample based on the different mediums of study

	Type of Medium	N	Mean	S.D	Df	t-value
Educational Purposes	Tamil	62	21.11	5.70	198	
	English	138	23.37	5.17		2.772**
Entertainment Purposes	Tamil	62	14.55	3.67	198	
	English	138	15.42	3.10		1.626

**Significance at .1 level of confidence

Table 2 shows the sample analysis based on the school's medium of study. Educational awareness relates to the statement-wise awareness of VR technology in teaching, learning and instruction. When it was compared based on medium of instruction namely Tamil and English medium, it was seen that there is a significant difference in their awareness. Mean values suggest that pre-service teachers from English medium possess better awareness on VR compared to their Tamil medium counterparts. Hence, the hypothesis "There is no significant difference between pre-service teachers' awareness of VR for education based on the medium of study" is not accepted. Entertainment purposes relates to the statement wise awareness of VR technology in gaming, videos and tourism. When it was compared based on medium of instruction namely Tamil and English medium, it was seen that there was no significant difference in their awareness. Hence, the hypothesis "There is no significant difference between pre-service teachers' awareness of VR for entertainment based on the medium of study" is accepted.

Table 3

Analysis of the sample based on locality

	Locality	N	Mean	S.D	df	t-value
Educational Purposes	Rural	90	21.58	5.38	198	2.623**
	Urban	110	23.57	5.33		
Entertainment Purposes	Rural	90	14.39	3.43	198	3.003**
	Urban	110	15.77	3.08		

**Significance at .1 level of confidence

Table 3 shows the sample analysis based on the locality. Educational awareness relates to the statement-wise awareness of VR technology in teaching, learning and instruction. When it was compared based on locality of instruction namely rural and urban, it was seen that there is a significant difference in their awareness. The hypothesis "There is no significant difference between pre-service teachers' awareness of VR for education and entertainment based on the locality" is not accepted.

Table 4

Analysis of the sample based on different type of schools studied.

	Type of School	N	Mean	S.D	df	t-value	Sig.
Educational Purposes	Govt	107	22.31	5.99	198		.307
	Private	93	23.17	4.69		1.024	
Entertainment Purposes	Govt	107	14.94	3.46	198	.945	.346
	Private	93	15.37	3.13			

Table 4, shows the analysis of the sample based on the type of school studied. Educational purposes statement-wise awareness of VR technology in teaching, learning and instruction of government and private school studied pre-service teachers has no significantly different from their awareness. Hence, the hypothesis "There is no significant difference between pre-service teachers' awareness of VR for education based on the school studied" is accepted. Entertainment purposes statement-wise awareness of VR technology in gaming, videos and tourism of government and private pre-service teachers are similar to their awareness. Hence, the hypothesis "There is no significant difference between pre-service teachers' awareness of VR entertainment based on the locality" is accepted.

Scope for Future work

The scope of a study on Virtual Reality (VR) technology for education and entertainment, specifically the awareness of pre-service teachers, would likely focus on understanding the current level of knowledge and understanding that pre-service teachers have about VR technology and its potential uses in education and entertainment. This could include research on the types of VR technology that pre-service teachers are familiar with, their perceptions of the effectiveness of VR technology for teaching and learning, and their willingness to incorporate VR technology into their future classroom practices. Additionally, the study may also look into how pre-service teachers can be trained to use VR technology effectively in their teaching. During the pandemic, virtual classrooms became commonly used teaching, learning,

and evaluation platforms. Before the pandemic period 2020 also, virtual classroom applications existed, but it is not familiar for educational purposes. The pandemic era created a new way of learning to virtual modality from the experienced way of learning. Initially, VR technology became famous among all age groups for gaming. So over this period, virtual-based technologies have too many students by the schools, teachers, parents, and private learning platforms. If pre-service teachers know what this technology means, the integration of VR technologies in future classrooms will be natural, like PowerPoint presentations. This study is the preliminary study of promoting immersive technologies for teaching. The study was conducted in the year 2022, so pre-service special education, physical education, and education teachers were responded to based on their school curriculum only. Based on the findings, the following suggestions are made for future study.

1.   Integrating AR/VR-based studies with new pedagogical strategies for different content knowledge must be adopted.

2.   The teacher education curriculum has to modify the demands of the learners on reality-based technologies.

3.   Future research should focus on education on educational factors based on awareness level.

4.   The research on the awareness of VR for laboratory experiments needs to be studied in the future.

5.   Policy researchers should highlight each domain's reality-based or high-end technology-based transitions.

6.   VR/AR is becoming an essential technology for transitions of learning and evaluation platforms. The same study can be taken into study the awareness of AR technology among the same samples.

Educational Implication of the study

The educational implications of pre-service teachers' awareness of Virtual Reality (VR) technology can be significant, as it can affect how they incorporate VR technology into their teaching practices. Some of the potential implications include:

1.   Improved integration of VR technology into the classroom: Pre-service teachers with a higher level of awareness and understanding of VR technology are more likely to incorporate it into their teaching practices, which can enhance the quality of instruction for their students.

2. Enhanced teacher training: Pre-service teachers with a higher awareness of VR technology may be better equipped to participate in professional development opportunities and training programs that focus on the use of VR technology in education.

3. Greater impact on student learning: Pre-service teachers who are aware of the benefits of VR technology and have the knowledge and skills to use it effectively can create more engaging and interactive learning experiences for their students, which can lead to improved student outcomes.

4. Keeping pace with technology: Pre-service teachers with a high awareness of VR technology will be better equipped to adapt to new and emerging technologies in the field, which can help them to stay current and effective in their teaching practice.

5. Fostering innovation: Pre-service teachers with a high awareness of VR technology can be more inclined to explore new and creative ways to use VR technology in the classroom, which can lead to more innovation in teaching and learning.

Conclusion

The awareness of pre-service teachers on virtual reality technology plays a crucial role in how they approach teaching and learning and how they incorporate the technology into their practice. Pre-service teachers with a higher level of awareness and understanding of VR technology are more likely to incorporate it into their teaching practices, which can enhance the quality of instruction for their students. They may also be better equipped to participate in professional development opportunities and training programs that focus on the use of VR technology in education. Additionally, pre-service teachers with a high awareness of VR technology will be better equipped to adapt to new and emerging technologies in the field, which can help them to stay current and effective in their teaching practice. Thus, it's important to provide pre-service teachers with the necessary knowledge and resources to become familiar with VR technology and its potential applications in education in order to foster innovation and improve student outcomes.

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