ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 03 | March - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EFFECTIVENESS OF VIRTUAL REALITY EDUCATION PROGRAM TO UNDERSTAND IMPORTANCE OF OCEAN, FOREST AND BIODIVERSITY FOR STUDENTS

Education

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ABSTRACT

Virtual Reality is one of the tools for education. Virtual Reality (VR) is a simulation in which computer graphics is used to create a realistic-looking world. Virtual Reality is a high-end user-computer interface that involves real time situation and interactions through multiple sensorial channels. Through its interactive environment, repetition and one-to-one experimentation, VR can help improve knowledge retention and student motivation. Sustainable Development Goals (SDGs) inform us to live on earth by using its valuable resources with due care, inspire us to reside amicably with nature and have integration with biodiversity around us. The paper focuses on how Virtual Reality was effective in understanding importance of ocean, forest and biodiversity for students of Secondary School in Linga (Dist. Dang). The result concluded that Virtual Reality helps in understanding the concepts and it is one of the tools to educate students. It is a great means of edutainment.

KEYWORDS

Educational Technology, Virtual Reality, Sustainable Development Goals

INTRODUCTION

Education is an act or process of acquiring and imparting knowledge, skills and attitudes. Technology refers to the techniques as well as technical contrivances. It is a science of techniques and methods of doing or getting thing done, related to any art, science or particular profession. Technology thus results in new designs and devices as also new ideas and processes. Educational Technology is one of the means to impart education to students. Virtual Reality is a simulation in which computer graphics is used to create a realistic-looking world. Moreover, the synthetic world is not static, but responds to the user's input (gesture, verbal command, etc). The key feature of virtual reality is real time interactivity. The real time means that the computer is able to detect a user's input and modify the virtual world instantaneously. There are three I's of Virtual Reality-Interactive, Immersive and Imagination. As per Moshel and Hughes (2002), educational theories classify learning activities as constructivist, constructionist or situated. Constructivist learning involves exploration of prebuilt worlds and discovery. During constructionist learning, students must actively build models of the world as opposed to exploring already build ones. Situated learning is done through role playing where students assume a certain character in order to better understand its way of life. Situated learning involves group interaction and development of social skills.

The concept of Sustainable Development Goals came into existence in the year 1992 during United Conference on Environment and Development. Sustainable Development Goals aspire to inform, inspire and integrate. These goals inform us to live on earth by using its valuable resources with due care, inspire us to reside amicably with nature and have integration with biodiversity around us. Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations General Assembly in 2015.

The Sustainable Development Goals are as follows:

1) No poverty: End poverty in all its forms every where
2) Zero hunger
3) Good health and well-being
4) Quality education,
5) Gender equality
6) Clean water and sanitation
7) Affordable and clean energy,
8) Decent work and economic growth,
9) Industry, innovation, and infrastructure,
10) Reducing inequality,
11) Sustainable cities and communities
12) Responsible consumption and production
13) Climate action,
14) Life below water
15) Life on land
16) Peace, justice, and strong institutions,
17) Partnerships for the goals.

Oceans hold a significant amount of resources, including food, medicines, bio-fuels and other products inside. Oceans supply half of the oxygen we breathe with significant absorption of pollutants like carbon dioxide from our environment. They are home to biggest biodiversity with beautiful coastal ecosystem providing rich scenic beauties for tourism and acting as buffers against the impact of storms. Oceans are home to the most stunning and vivid forms of life. India is a land of biodiversity rich forest cover, wetlands and dry lands. The main reason for the increased mass-extinction is the loss of forests.

Objectives of the study

The study was designed with the following objectives:

1) To develop Virtual Reality Education Program importance of on oceans, biodiversity and forests which are parts of Sustainable Development Goals.
2) To make aware secondary school of Standard 8 and 9 about Sustainable Development Goals through Virtual Reality Education Program.
3) To know effectiveness of Virtual Reality Education Program on Sustainable Development Goals for students of Standard 8 and 9.

Plan and procedure of the study

The study was conducted in different phases:

Phase 1: Development of Virtual Reality Interactive Learning Program

The researcher made a Virtual Reality Interactive Learning Program on Sustainable

Development Goals. Two Sustainable Development Goals: life on land and life on water was taken in this learning tool. The researcher took help of professionals to develop interactive learning program.

Details of the Virtual Reality Interactive Learning Program

Virtual Reality Interactive Learning Program consisted of Virtual Reality visuals of 14.28 minutes time duration. 360 degree technology was used in developing the Virtual Reality program. The program was made to educate students on two out of 17 Sustainable Development Goals viz. life on land and life on water. The program content was made to aware students on importance of biodiversity in our day to day life, ecosystem of nature and how one can fulfill sustainable development goals.

Phase 2: Implementation of the program

The Virtual Reality Interactive Learning Program was implemented on students of Standard 9 and 10 studying at Secondary School at Linga in Dang district of Gujarat. The researcher took semi-structured interview of students to know the feedback on the Interactive Learning Program. The researcher developed a five point reaction scale to know the liking on the Virtual Reality Program. The reaction included was Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree.

METHODOLOGY

The population consisted of all students of standard 9 and 10 studying at Linga in Dang district of Gujarat. Due to precautionary measures against COVID-19, convenient sample was taken by the researcher. The researcher did oral and power-point presentation to students and made them aware about VR technology and importance of ocean, forest and biodiversity. The Virtual Reality Interactive Learning

Program was shown to students with Virtual Reality sets and equipments. One student was called one at a time to watch the program. Total 80 students were taken as a sample.

Analysis of Intensity Index

The researcher went to Secondary School in Linga (Dist. Dang) and collected a sample of 80 school students studying in standard 9 and 10.

Table 1: Intensity index regarding usefulness of content in the VR program for self study

Statement	Total students	SA	A	UD	DA	SD	IE
Content in the VR program helped a lot for self-study	80	68	0	2	4	6	4.5

Out of 80 students, 68 students strongly agreed that content in the VR program helped for self-study. Two students were undecided about usefulness of content in the VR program for self study. Four students disagreed and six students were disagreed about usefulness of content in the VR program for self study respectively. The intensity index was 4.5. Thus according to students' reactions, content in the VR program helped students for self-study.

Table 2: Intensity index regarding understanding of Sustainable Development Goals through VR program

Statement	Total students	SA	A	UD	DA	SD	IE
VR program helped in proper understanding of Sustainable Development Goals	80	0	77	3	0	0	3.96

Out of 80 students, 77 agreed and three were undecided that VR program was useful to understand Sustainable Development Goals respectively. The intensity index was 3.96. Thus according to students' reactions, VR program was useful to understand Sustainable Development Goals.

Table 3: Intensity index regarding visual effects and sound in VR program

Statement	Total students	SA	A	UD	DA	SD	IE
Visual effects and sound in the VR program were effective in learning the concepts of oceans, biodiversity and forests.	80	80	0	0	0	0	5

All 80 students were strongly agreed that visual effects and sound in the VR program were effective in learning. The intensity index was 5. Thus according to students' reactions, visual effects and sound were effective in learning the concepts of oceans, biodiversity and forests.

Figure 1: Students watching VR Education Program

Major Findings

The research confirmed that the real feel infused an interest in learning. The students told that they felt that they are part of the ocean and forest. The technology gave a feel of placing students into the ocean and forests. Thus the technology connected students with the visuals for understanding the concepts. The visuals of species residing in ocean like corals, tortoises and fish gave edutainment. The students responded that their attention got distracted during the study in the classroom. In the classroom environment, they got disturbed as their attention got diverted due to different reasons. Due to mischief by classmates, the students were not able to keep attention while listening to teachers, seeing on blackboard and reading the textbook. In VR technology, there was VR headset in-front of eyes. Hence the attention of students was not distracted. The students told that in VR, there were moving images which were more suitable for learning.

CONCLUSION

The research concluded that the VR technology was a good support system to impart education. This could be a tool for educating students on different topics of study. VR education program could be made on principles and concepts related to curriculum and gain extra knowledge. The learning through VR was in nascent stage. The students were fond of VR technology and ready to accept it in future. VR technology was one of the means to understand concepts on importance of ocean, forest and biodiversity. VR was a remarkable tool for self-learning.

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