AJANTA

Ajanta Prakashan

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1. A Study on Virtual Reality in Education System: Impacts and Benefits for the Students and Teachers

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Abstract

Digital Technologies take education to an entirely new level, opening new doors and possibilities for teachers and students alike. Virtual Reality is an interactive experience with the simulated environment. Virtual reality makes teaching learning process more excited and effective. The fact is that, the brain remembers 10% of what it reads, 20% of what it hears and 90% of what is does and simulate. A survey is conducted in schools and colleges to better understand what educators and students think about the application of new technologies-particularly virtual reality in the classroom. The study shows that very few educators are aware about the implementation of Virtual reality in the Education System but teachers are here open minded and willing to use such technologies when it comes to the implementation to the schools and colleges. The data for the research was collected through both primary and secondary sources including personal interviews, survey forms, literature study, and articles from teachers and students. Researchers found that VR will benefit more science, social studies, and history whereas through this survey educators accepted that the teaching learning process will improve and it will help students with special abilities as well as those students who is an average performer in the classroom. Survey is also been done on students to understand how much they are ready to accept such technology over traditional methods. Majority of the learners found fascinating if it is been included in the curriculum.

Keywords : Virtual Reality, Education System, Game Based Learning, 3D Graphics

1. Introduction

Virtual Reality (VR) literally makes it possible to experience anything, anywhere, anytime. It is the most immersive type of reality technology and can convince the human brain that it is somewhere it is really not. Head mounted displays are used with headphones and hand controllers to provide a fully immersive experience. With the largest technology companies on planet earth (Facebook, Google, and Microsoft) currently investing billions of dollars into virtual

reality companies and start-ups, the future of virtual reality is set to be a pillar of our everyday lives.

Virtual Reality creates three dimensional image or an artificial working environment which is a combination of hardware and software and user can use in such a way that it is accepted or working in real environment.
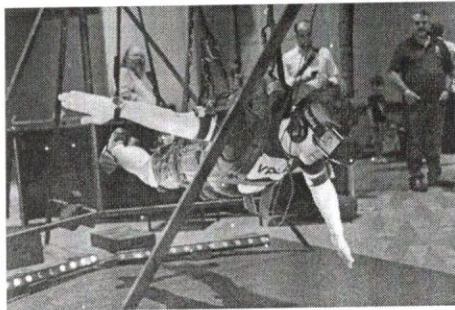
Immersion is been created in such a way that the sensory of humans feels real and forget that they are in virtual-artificial environment.

1.1 Key Elements of Virtual Reality

a) Virtual World

It is 3D Environment where one can interact and even create movements which can change and also experience response in the real world.

b) Immersion

Immersion is the human perception of being present non-physical world into the real world. When human senses completely get activated to believe the presence of non-real world, here, there are possibilities of two types of immersion:

1. Mental Immersion: When there is a total involvement of mind in to the virtual world.

2. Physical Immersion: When there is physical involvement with the sense of virtual world.

c) Sensory Feedback

Virtual Environment will be able to response to the users in natural manner, excitement and senses of immersion.

1.2 How Does VR Technology Work?

In order for the human brain to accept an artificial, virtual environment as real, it has to not only look real, but also feel real. Looking real can be achieved by wearing a head-mounted display (HMD) that displays a recreated life size, 3D virtual environment without the boundaries

usually seen on TV or a computer screen. Feeling real can be achieved through handheld input devices such as motion trackers that base interactivity on the user's movements. By stimulating many of the same senses one would use to navigate in the real world, virtual reality environments are feeling increasingly more like the natural world.

2. Literature Review

- Referred Research Paper by Virtual Reality in Education Chris Christou University of Nicosia, Cyprus

- Referred Research Paper by Virtual reality in education: a tool for learning in the experience age Elliot Hu-Au* and Joey J. Lee Department of Communications, Media, Learning Technologies Design, Teachers College, Columbia University.

- Referred Research Paper by The Use of Virtual Reality in Education MEHRYAR NOORIAFSHAR, RON WILLIAMS, and TEK NARAYAN MARASENI University of Southern Queensland, Toowoomba Australia

- Referred Research Paper by VIRTUAL REALITY AS A TOOL IN THE EDUCATION Sandra Dutra Piovesan1, Liliana Maria Passerino1 and Adriana Soares Pereira2 1 Universidade Federal do Rio Grande do Sul 2 Universidade Federal de Santa Maria

- Article "State of the Art Virtual Reality and Augmented Reality Knowhow" written by Rabia M. Yilmaz.

- Referred Blog: https://theblog.adobe.com/virtual-reality-will-change-learn-teach/

3. Research Objective

The objective of this research to study about the Virtual Reality and its implication in the education system and to learn advantages and disadvantages from point of view of teachers and students.

4. Research Methodology

The data has been collected through Primary as well as Secondary resources including four research papers which were reviewed, articles and blogs. Data has also been collected through questionnaire and survey. Majorly targeted audience were teachers and students from Schools, Administration, Librarian, Student and colleges.

5. Problem Statement

In India, VR technology is not been used much for education purpose as we are recently started with our first VR classroom in one of the Sainik Girls Schools located in Gujrat. During this research, it has shown that more than 60% of students are using VR technology for gaming and only 13% are using VR for studies.

6. Sample Size

From the survey, total 43 teachers and 148 students answered to the questionnaire and analysis was done on each question to understand the acceptance of Virtual Reality technology in the field of education.

7. Hypothesis

For Teachers

H0: If $\mu 0$ (Acceptance Rate among Teachers) > 40%: Educators are in a position to accept the VR technology for teaching/learning process in the education system.

H1: If $\mu 1$ (Rejection Rate among Teachers) >=40%: Educators are not in a position to accept the VR technology for teaching/learning process in the education system.
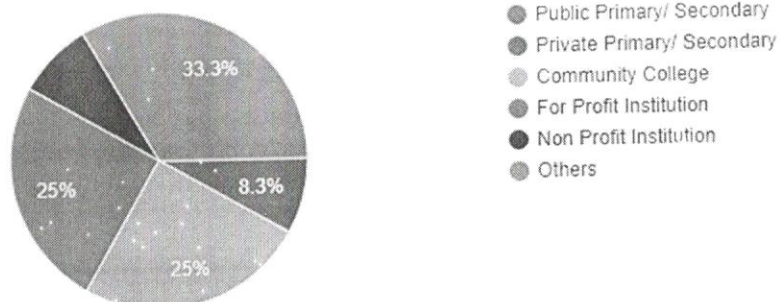
For Students

H0: If $\mu 0$ (Acceptance Rate among Teachers) > 40%: Learners are in a position to accept the VR technology for teaching/learning process in the education system.

H1: If $\mu 1$ (Rejection Rate among Teachers) >=40%: Learners are not in a position to accept the VR technology for teaching/learning process in the education system.
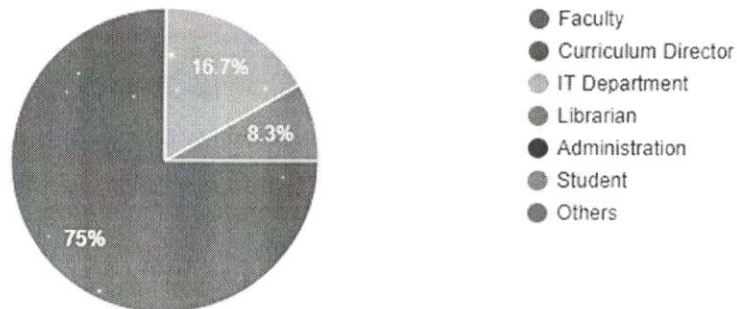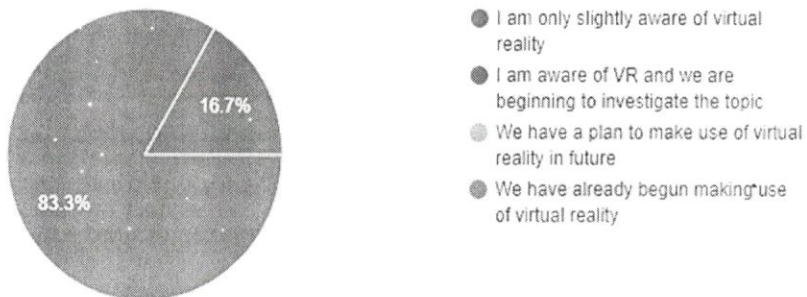
7. Sampling Analysis

Teacher's Views

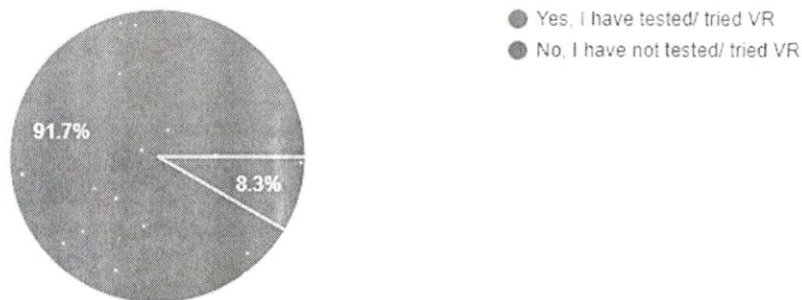1. Which of the following best describes your institution?

- Public Primary/ Secondary
- Private Primary/ Secondary
- Community College
- For Profit Institution
- Non Profit Institution
- Others

33.3% 8.3% 25% 25%

2. Which of the following best describes your job function?

- Faculty
- Curriculum Director
- IT Department
- Librarian
- Administration
- Student
- Others

3. How familiar are you with the concept of virtual reality (VR)?

- I am only slightly aware of virtual reality
- I am aware of VR and we are beginning to investigate the topic
- We have a plan to make use of virtual reality in future
- We have already begun making use of virtual reality

4. Have you ever tested VR or tried it for teaching or training?

- Yes, I have tested/ tried VR
- No, I have not tested/ tried VR

5. If you have tried VR in school/college, in what subject area(s)? (Check all that apply)

| Subject	Value
History	0 (0%)
Engineering	1 (33.3%)
Design	0 (0%)
Arts	0 (0%)
Science	0 (0%)
Commerce	1 (33.3%)
English	0 (0%)
mathematics	0 (0%)
Management	0 (0%)
Others	1 (33.3%)
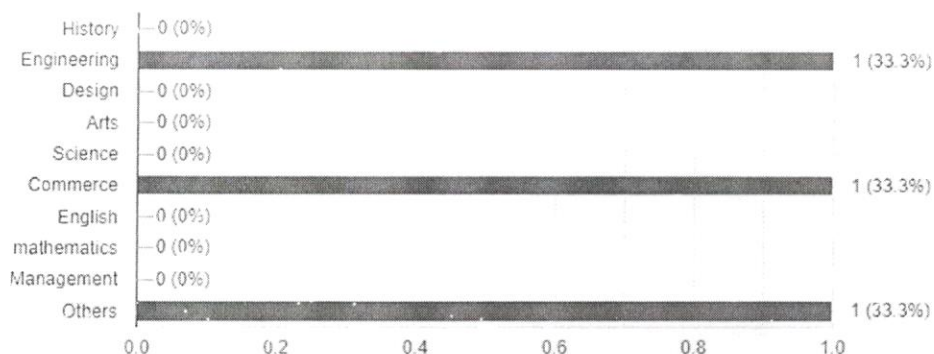
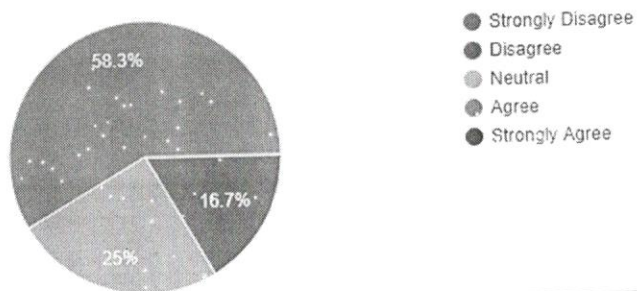6. What are your top concerns regarding VR technology?
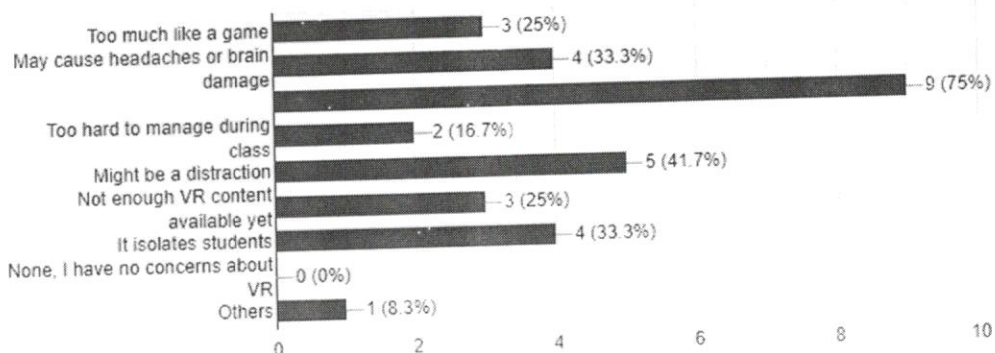
7. According to you, What can be the major benefits of using virtual reality in education?
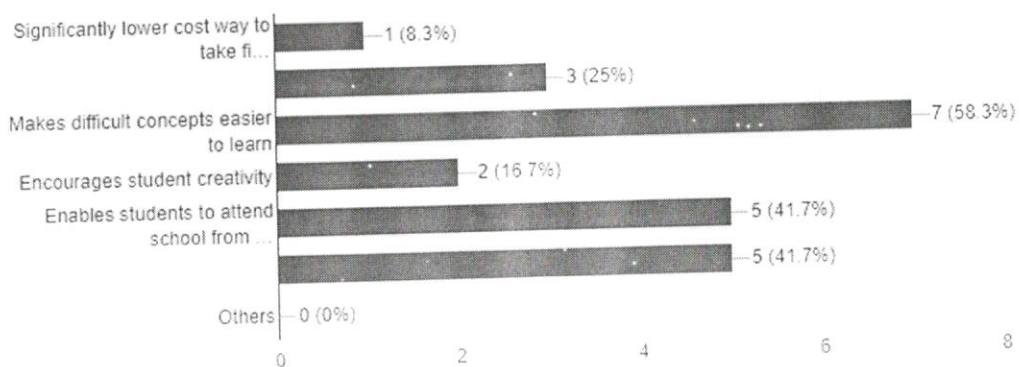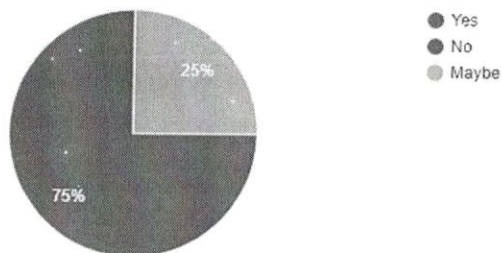

8. What are the Primary Technology tools you have used for teaching in the classrooms?
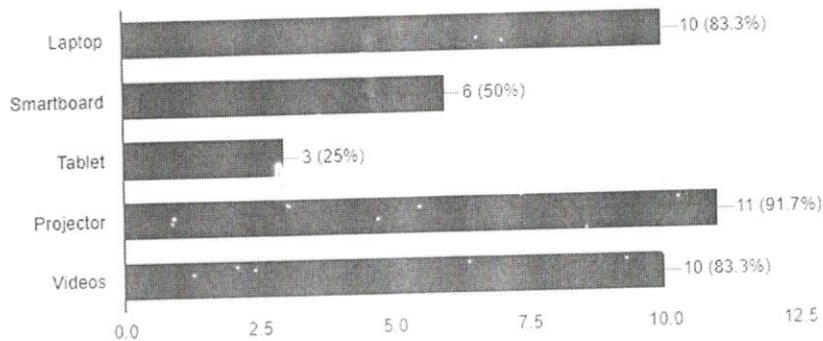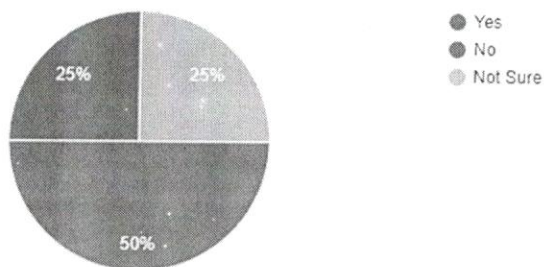

9. Do you think students with learning difficulties may perform better if they learn through VR?
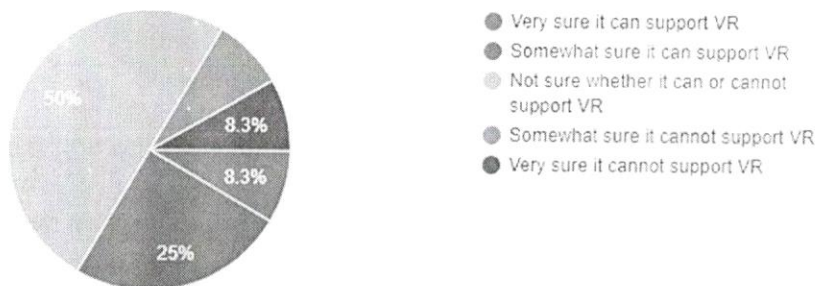
11. Do you think VR will promote learning through experience for both students and teachers?
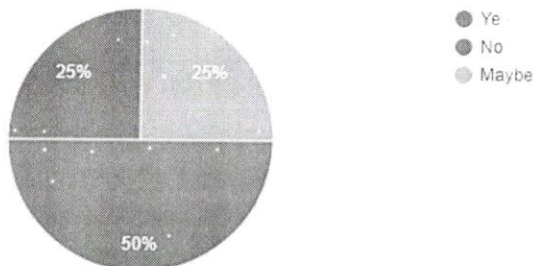

- Yes
- No
- Maybe

25%

75%

12. Do you expect from your school/college to use VR in the future?

- Yes
- No
- Not Sure

25% 25%

50%

13. How sure are you that your IT infrastructure can support VR technology?

- Very sure it can support VR
- Somewhat sure it can support VR
- Not sure whether it can or cannot support VR
- Somewhat sure it cannot support VR
- Very sure it cannot support VR

50%

8.3%

8.3%

25%

14. Do you think VR is useful only for selected areas of teaching/learning
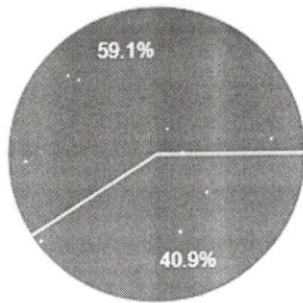

- Ye
- No
- Maybe

25% 25%

50%

Student's Views

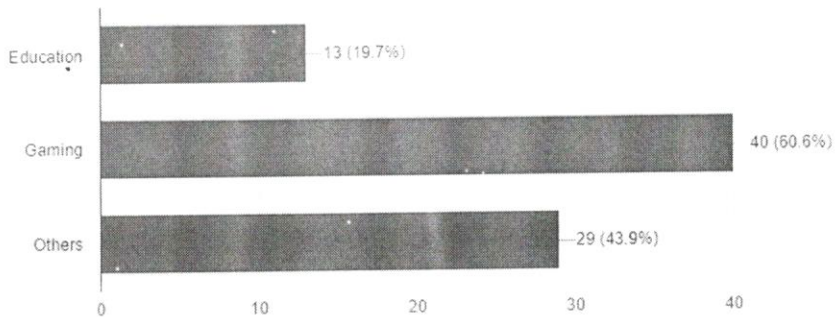**1. How familiar are you with the concept of virtual reality (VR)?**
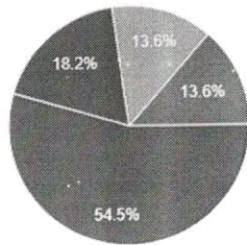
- I am only slightly aware of virtual reality
- I am aware of VR and we are beginning to investigate the topic
- We have a plan to make use of virtual reality in future
- We have already begun making use of virtual reality

13.6%
13.6%
18.2%
54.5%

2. Have you ever tested VR or tried it for teaching or training?
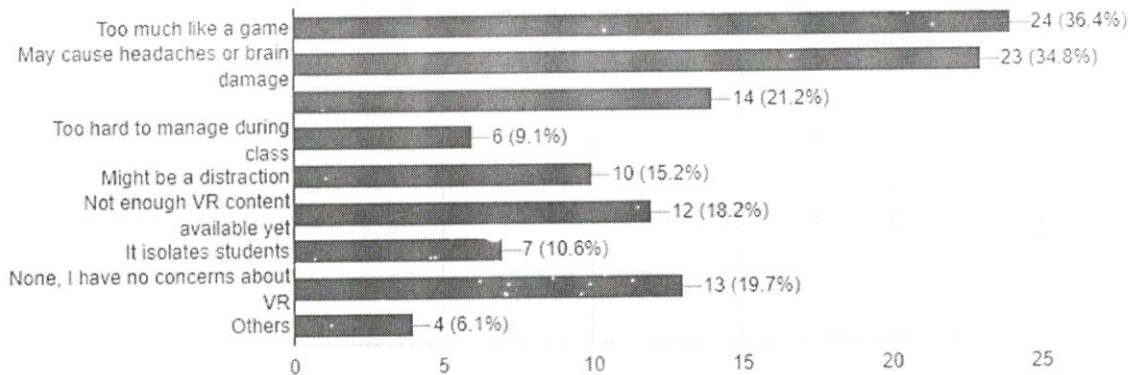

- Yes, I have tested/ tried VR
- No, I have not tested/ tried VR

59.1%
40.9%

**3. If you have tried VR, for what purpose? (Check all that apply)**

Education — 13 (19.7%)
Gaming — 40 (60.6%)
Others — 29 (43.9%)

4. What are your top concerns regarding VR technology? 66 responses

Too much like a game — 24 (36.4%)
May cause headaches or brain damage — 23 (34.8%)
— 14 (21.2%)
Too hard to manage during class — 6 (9.1%)
Might be a distraction — 10 (15.2%)
Not enough VR content available yet — 12 (18.2%)
It isolates students — 7 (10.6%)
None, I have no concerns about VR — 13 (19.7%)
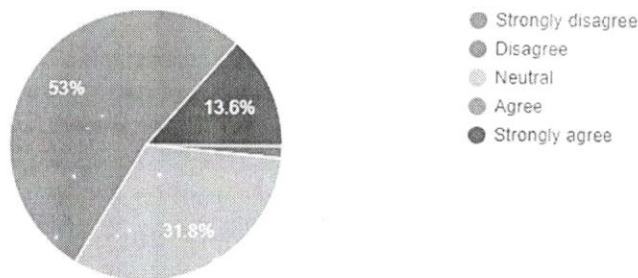Others — 4 (6.1%)

5. According to you, What can be the major benefits of using virtual reality in education?
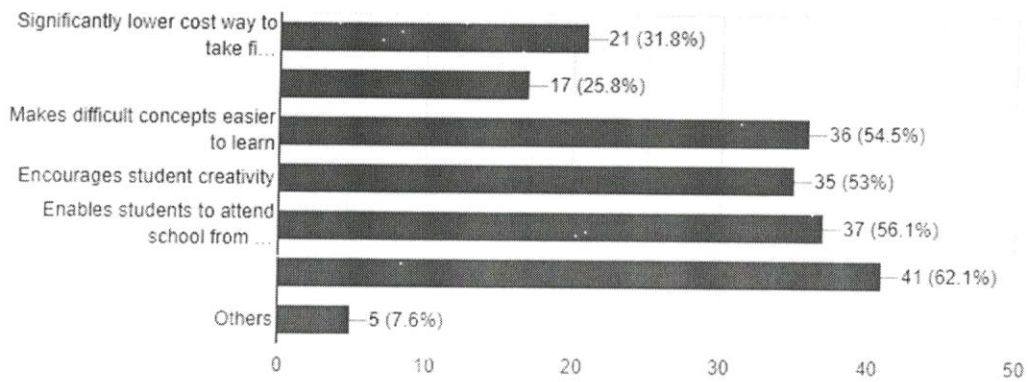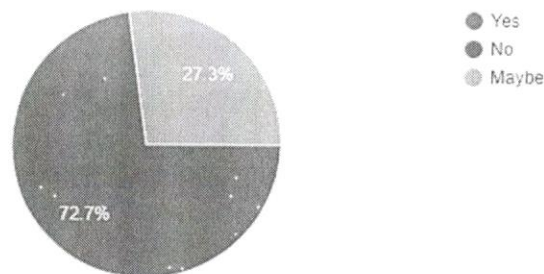

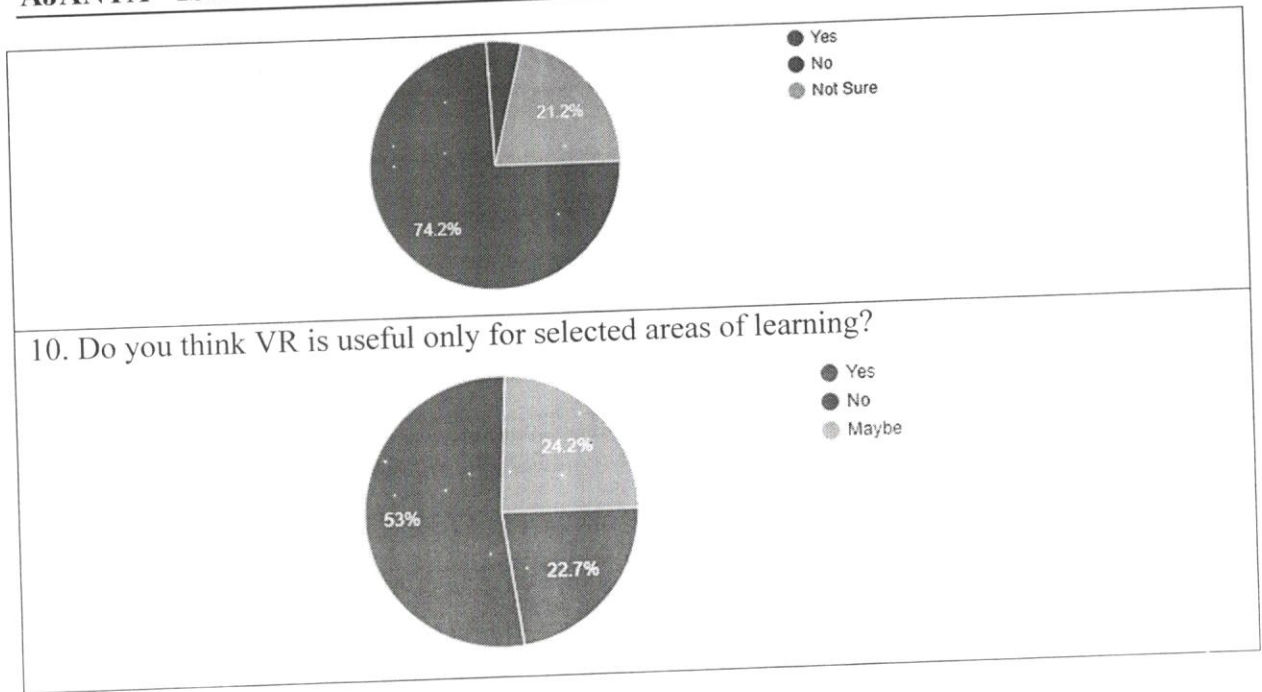6. Do you think students with learning difficulties may perform better if they learn through VR?
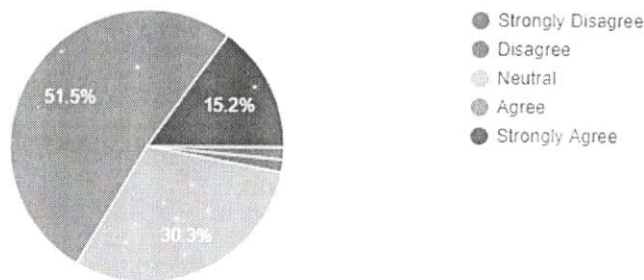
7. Do you agree that low achieving students may perform better with the benefits of VR

8. Do you think VR will promote learning through experience for both students and teachers?

9. Do you expect from your school/college to use VR in the future?

- Yes
- No
- Not Sure

21.2%

74.2%

10. Do you think VR is useful only for selected areas of learning?

- Yes
- No
- Maybe

24.2%

53%

22.7%

Augmented reality (AR) is a new technology that acts as a bridge between real world and virtual environment by providing synchronous interaction.
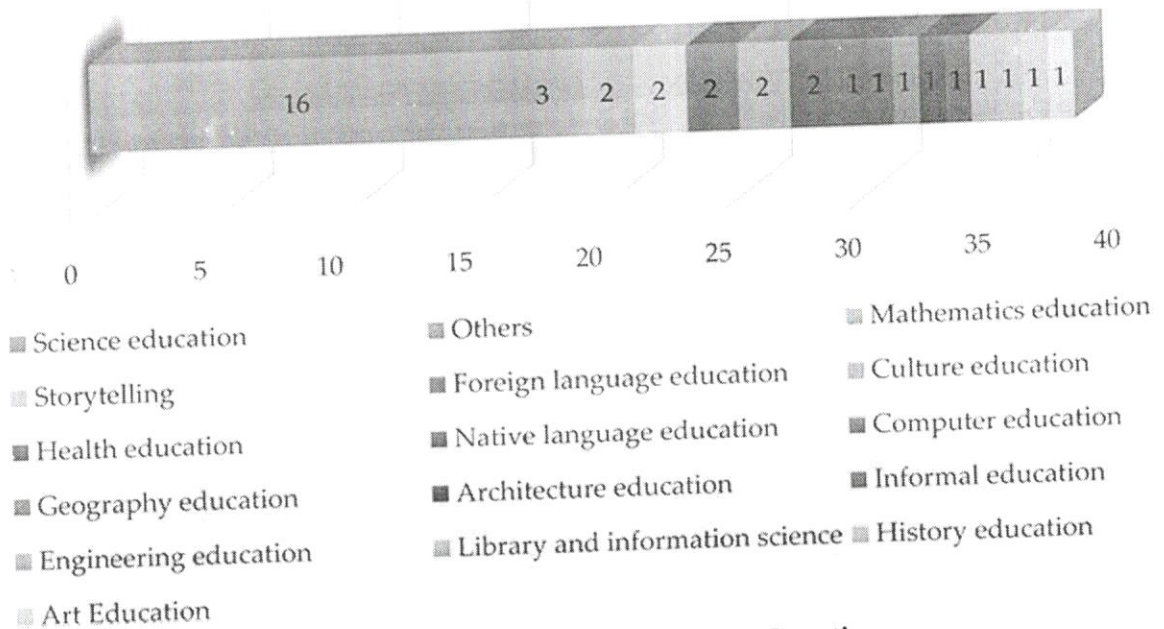
Data from Secondary Sources

- ■ Science education
- ■ Storytelling
- ■ Health education
- ■ Geography education
- ■ Engineering education
- ■ Art Education
- ■ Others
- ■ Foreign language education
- ■ Native language education
- ■ Architecture education
- ■ Library and information science
- ■ Mathematics education
- ■ Culture education
- ■ Computer education
- ■ Informal education
- ■ History education

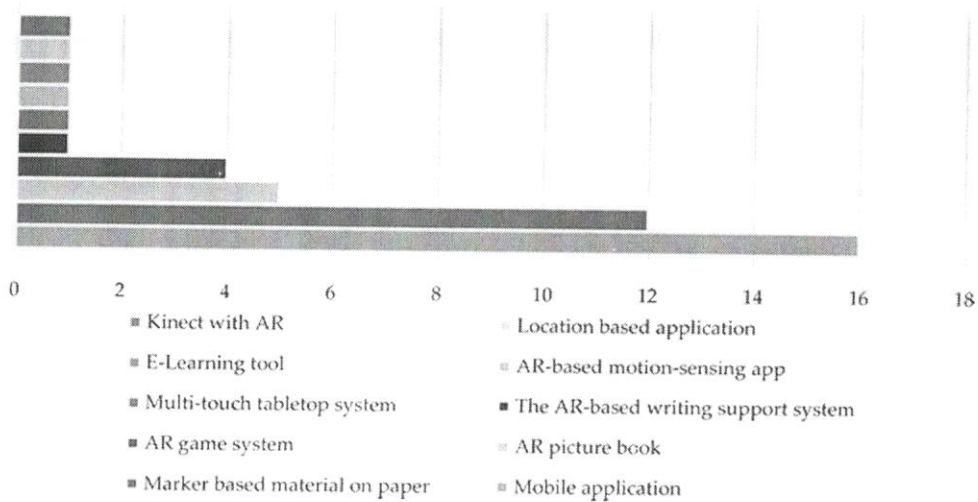**Figure 1. Using AR by field of education**

Figure 2.Material types of AR used in education.

8. Results

The main aim of this research is to review literature regarding the use of AR and VR in the education system. The results showed that the educational institution and teachers are not using the VR technology frequently and many educators have not used VR technology due to which H0 (Null Hypothesis) failed and proved that the H1 (Alternative Hypothesis) passed. In the other case, where students are very much aware about the technology and using for many purpose including education. More than 80% students accepted that they are aware about technology but using it majorly for Gaming. Also students accepted that it will help the students and will make them more engaged with the lectures. Teachers are little aware as they felt it looks like a gaming environment and it can distract students from learning.

9. References

- https://news.samsung.com/global/survey-shows-that-teachers-see-potential-for-virtual-reality-in-education

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- https://thinkmobiles.com/blog/virtual-reality-education/

- https://www.realitytechnologies.com/virtual-reality/

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