



Stakeholders' Perceptions regarding the use of Hologram for Educational Purposes in District Toba Tek Singh, Pakistan

Muhammad Hasan Rehman¹, Muhammad Shahbaz², Rana Muhammad Amir^{1*}, Hafiz Ali Raza^{1*} and Ayesha Kanwel¹

¹Institute of Agri. Extension, Education and Rural Development, University of Agriculture, Faisalabad, Punjab, Pakistan

²The School of Engineering & the Built Environment, Edinburgh Napier University, UK

ABSTRACT

Hologram is essential in education because it is more helpful for students to clear their concepts through moving objects and engaging many students. Different hologram types are used in various educational institutes such as reflection holograms, transmission holograms, and pyramid holograms. It is an exciting and widely discussed tool in the world. ICTs are frequently used, such as computers, laptops, projectors, smart boards, and other audiovisual aids. The study's purpose was to attain stakeholders' perceptions regarding the use of holograms for educational purposes in District Toba Tek Singh, Punjab, Pakistan. The total sample size of 116 respondents were selected from the population by using a simple random sampling technique. The results indicated that most of the respondents were agreed that the strengths of hologram technology could be meaningful in the teaching-learning process. It is also concluded that students fear new technology will be less and more time-saving due to hologram technology use in the teaching-learning process. It also discovered that lack of leadership's quality was a significant barrier to adopting hologram technology in the education system.

Keywords: ICT; Students perception; Learning; Education; Technology

*Corresponding Authors: Rana Muhammad Amir, Email: muhammad.amir@uaf.edu.pk; Hafiz Ali Raza, Email: razaa0617@gmail.com

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INTRODUCTION

In simple terms, hologram technology is a three-dimensional projection that can be perceived without the use of a special device such as cameras or glasses. The image can be viewed from any angle, so as the user walks around the screen, the object will appear to be moving and shifting realistically. Holographic images can be static, such as an image of an invention, or they can be moving sequences that can be watched by many people from any angle.

The technology used to capture and display holograms has been rapidly innovating in recent years. These latest techniques allow for the emergence of larger and more interactive models and, predictably, they will become even more widespread in the future. The hologram looks so realistic because it is an accurate record of the light waves reflected from the object. Different lasers can produce different colors of an object. The most widely used type of laser is the sun-neon.

Although some of them are made of red laser pointer diodes, they are generally unstable and less cohesive (Cruz et al., 2016). Different holograms can be used for other educational levels, as there are now different holograms, such as reflection holograms, transmission holograms and pyramidal holograms (Ramachandiran et al., 2019). Holography significantly disrupts 3D images, as it offers better usability and addresses the weaknesses of 3D solutions. It can potentially affect every aspect of life, but paradoxically, it can change the game in the medical industry (Mishra, 2017).

You can interact with the researcher in real-time and everyone seems to be in the same room. Researchers and teachers would use verbal communication, body language and virtual images to share and exchange information (Caggianese, 2018). Technology integration means applying educational technology to inspire positive teaching methods to facilitate students' learning and increase their ability, productivity and performance in their learning process (Lee, 2013). In the educational system, information and communication tools are used often from recent times, such as computers, smartboards, cell phones, projectors, audiovisual media, aids, etc. in the teaching and learning process (Devi et al., 2019).

Recently, technological developments have played a fundamental role in improving the educational process. For example, many academic institutions use advanced technological tools, such as touch screens, new software, and other students (Law, 2021). Students improve their understanding of the meaning of learning topics, especially in the fields of medicine and engineering, to better understand what they remember. We can apply 3D hologram technology

to any educational level (pre-school, primary and secondary education and tertiary education). This can transcend the slow adaptation of technology to the education system (Elmarash et al., 2021).

Holographic teleshopping technology has opened the door to new possibilities for an unimaginable level of commitment and enthusiasm in the learning process that engages and encourages students (Venditti and Mele, 2020). It has to do with human skills and abilities. Three main elements must be involved effectively to ensure a better result. These are the teacher, the student, and the appropriate educational environment. Using 3DHT, it is possible to achieve the same real-world training goals (Abdelhamid, 2020).

This is done to help students understand learning content more effectively than using these traditional approaches, according to the Industrial Revolution. As students are more favorable to the use of technology, teachers should take a step forward Feng and Yamat, (2019). The Ministry of Education should also provide adequate facilities for educational institutions to make effective use of technology (Halili, 2019).

Healthy lifestyle and learning flexibility had affected mental health when examining the relationship between the two variables (Nur Arif Syazana, 2019).

Objectives of the Study

The objectives are to:

- Identify the strengths of the hologram in teaching and learning.
- Identifying opportunities for the use of holograms in the field of education.
- Identification of obstacles in the adoption of hologram technology in the educational system

Research Questions

The questions of the research are:

- Strengths of hologram technology in the teaching-learning process
- Opportunities of Hologram in the education sector
- Barriers in the adoption of hologram technology in the education system

MATERIALS AND METHODS

Toba Tek Singh is a city and district of Pakistan's Punjab province. It was separated as a district in 1982 and it is located in the center of Punjab province of Pakistan. Parveen et al., (2021) suggested that the teachers and students take part equally for quality of education which can indicate the positive performance of the students. Wang et al., (2021) reported that teachers' instructions completely depend on students' perception and it's a huge challenge for the teachers how they tackle the recent situation. Survey-based research was conducted in this study because survey research has a high response rate compared to others (Parveen and Tran 2020; Aslam et al., 2021). Purposively secondary school science subjects were selected from tehsil Toba Tek Singh because various diagrams are present in science subjects. Teachers feel difficulty explaining all the parts of the diagram and clarifying students' concepts.

Population

It is a large group of people where they live together (Taherdoost, 2016). The target population is the hypothetical set of individuals, objects, or events that are the actual participants, and the researchers have a desire to generalize/simplify the outcomes of the study. The population is the totality of the subjects out of which a sample is taken for the research purpose. The population of this research was all the science teachers at secondary school (166 teachers).

Sampling

Sampling is described to be the sub-group of the population to gather information from the respondents (Aslam et al., 2020; Phuc et al., 2020). The sample for this study has been drawn by the simple random sampling technique. A total of 116 teachers were selected from the population.

Research Procedure

Shafiq *et al.*, (2018) suggested the method to design a well-structured close-ended questionnaire that was designed for gathering information from the respondents. Data were analyzed with the help of the computer software Statistical Package of Social Sciences (SPSS) for an effective conclusion (Shafiq *et al.*, 2020).

RESULTS AND DISCUSSIONS

Table 1: Distribution of the respondents according to strengths of hologram technology in the teaching-learning process

Statement	Weighted score	Mean	STD	Rank order
Students fear toward new technology will be less	224	1.93	0.74	1
Time saving process	223	1.92	0.83	2
It is a source to entertain the students	215	1.85	0.68	3
Students' academic achievement will increase with the use of Hologram	211	1.82	0.67	4
Student's interest will increase toward Learning	209	1.80	0.53	5
Learning by seeing have a long-term memory	207	1.78	0.49	6
Learning will enhance with the use of Hologram	207	1.78	0.49	7
Capable to engage large class	206	1.78	0.62	8
It will clear students' concepts more than books	201	1.73	0.53	9
Students like moving objects in Learning	194	1.67	0.49	10

Nadila *et al.*, (2021) recommended that smart 3D Hologram is reflected as the most innovative technology that gives several benefits in education such as helping teachers and students. Table 1 showed that most of the respondents were agreed that the following strengths of hologram technology could be meaningful in the teaching-learning process e.g., students fear toward new technology will be less; also a source to entertain the students, students' academic achievement will increase with the use of hologram, students interest will increase toward learning, learning by seeing have a long term memory, learning will enhance with the help of hologram, capable to engage large class, it will clear students concept more than books, students like moving objects in learning were rated with mean value 1.93, 1.92, 1.85, 1.82, 1.80, 1.78, 1.78, 1.78, 1.73, 1.67 respectively.

Table 2: Distribution of the respondents according to opportunities of hologram in the education sector

Statement	Weighted score	Mean	STD	Rank order
Peer group importance will increase	213	1.84	0.71	1
Small content and greater information communication	211	1.82	0.79	2
Difficulties of the drawing will have vanished	208	1.79	0.58	3
Teaching from books is easier than technology	206	1.78	0.79	4
Special training courses will be required regarding the use of hologram	200	1.72	0.63	5
Special setup and classroom will be required for communication	197	1.70	0.62	6
The curiosity of students will increase related to hologram images	193	1.66	0.49	7
This technology is best for graduation and master level	190	1.64	0.65	8
With more explanation, learning will enhance	189	1.63	0.55	9
Teachers and students will play an active role in the classroom	177	1.53	0.52	10

Table 2: shows that the majority of the respondents were in favor that the following opportunities of hologram could be useful in the education system such as peer group importance will increase, small content and greater information communication, difficulties of the drawing will vanish, teaching from books is easier than technology, special training courses will be required regarding use hologram and special setup and classroom students will play an active role in the classroom were rated with mean value 1.84, 1.82, 1.79, 1.78, 1.72, 1.70, 1.66, 1.64, 1.63, 1.53 respectively. Pradhan *et al.*, (2021) reported that the education system can be enhanced through active teaching and learning environment for this purpose teachers can help through the latest technologies or it may be possible through practices. Matere *et al.*, (2021) suggested that virtual classrooms show interactive systems which may act not only for teachers but also students as well.

Table 3: Distribution of the respondents according to barriers in the adoption of hologram technology in the education system

Statement	Weighted score	Mean	STD	Rank order
Lack of leadership	389	2.01	0.55	1
Lack of coordination among teachers and stakeholders	386	2.00	0.66	2
Lack of vision	376	1.98	0.56	3
Caring of the hologram	254	1.97	0.72	4
Non-teaching assignments for teachers	242	1.95	0.63	5
Burden of more classroom	234	1.92	0.74	6
Budget for education	233	1.75	0.59	7
Repairing problem	232	1.70	0.56	8
Preparation of lecture on hologram	230	1.68	0.49	9
Corruption is a big issue	229	1.67	0.54	10
Expensive technology	226	2.01	0.55	11
Electricity is a big problem	223	2.00	0.66	12
Over loaded classroom is big problem	203	1.98	0.56	13
High-speed internet will be required	197	1.97	0.72	14
Trainee availability	195	1.95	0.63	15
Time to learn new technology	194	1.92	0.74	16

Table 3 shows that the majority of the respondents were agreed that the following barriers are the cause to adopt the hologram technology in the education system i.e. lack of leadership, the lack of coordination among teachers and stakeholders, lack of vision, caring of the hologram, non-teaching assignments for teachers, the burden of more

classroom, budget for education, repairing the problem, preparation of lecture on the hologram, corruption is a big issue, expensive technology, electricity is a big problem, an overloaded classroom is a big problem, high-speed internet will be required, trainee availability, time to learn new technology were rated with mean value 2.01, 2.00, 1.98, 1.97, 1.95, 1.92, 1.75, 1.70, 1.68, 1.67, 2.01, 2.00, 1.98, 1.97, 1.95 and 1.92 respectively. Matsika *et al.*, (2021) suggested that the main reasons which affect the teaching and learning process, first of all, there is no synchronization while making educational policies, teachers face difficulties while using new and advanced technologies.

CONCLUSIONS

It is concluded that students hesitate to touch and use the expensive things available in school due to feeling of punishment by the teachers. Some barriers exist in the adoption of hologram in education they are as follows, it is an expensive technology the poor countries are not able to provide in all the schools, as a very little budget they offer for education sectors a bit resistance is present towards new technology as it needs the training to modify the psychology toward innovating equipment's which is helpful in the teaching-learning process. Hologram technology requires high-speed internet for better communication it is also a barrier to the adoption of the hologram. The results indicated that students fear new technology will be less and more time-saving due to hologram technology use in the teaching-learning process.

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