



Hologram technology

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Abstract

The aim of this paper is to discuss the meaning of 3D Hologram Technology (3DHT), how this technology was created and the importance of it in education. A 3D holographic object is a kind of optical technology to record patterns. Holography uses red lasers, commonly helium-neon (HeNe) lasers. Although holography is frequently referred to as "lensless photography", it does require lenses. In recent, many schools start using three-dimensional hologram technology as a new creative educational way and This led to positive effects.

Introduction

What do you think the quality of life will be like after hologram technology is developed? As many movies show, hologram technology is usually used to reference a futuristic life. As time passes, we can definitely see growth in the development of hologram technology. We once started as 3D cinemas and evolved to hologram concerts like Um Kalthum's in KSA. What if holograms are used to create better education for the upcoming generations? Many parents struggle to motivate their children to study. A new method, made by a UK organisation called Beam Education, is planning to buck the trend. Hologram technology is being used to encourage children to develop healthy learning habits. Beam Education has already represented a number of educational companies, such as the BBC and Microsoft. Without being said, holograms are the future, and with a little bit of imagination, we can create a more colorful world=

What is hologram?

The word "holography" is derived from the Greek words "holo" which means "complete" and "graphy" which means "record." As a result, "holography" refers to the "whole record." It refers to the process of capturing all of the information about an object in a photograph. The user may look at this image and learn everything there is to know about the object.

The term "hologram" refers to a "three-dimensional picture created without the use of a camera by laser light reflected onto a photographic substance" [1]

Hologram technology began in 1962, when Yuri Denis Yuk of the Soviet Union and Emmett Leith and Juris Upatnieks of the University of Michigan created laser technology that could record three-dimensional things. albeit the quality of the objects was not ideal at the time. However, new methods for converting transmission to refractive index allowed holograms to improve over time.

for example, recent shows like CNN's special effect of a reporter appearing live from another location are not real holograms. However, is being developed to project 3D images from a different location. The pictures are static as well, but they are refreshed every two seconds, creating the impact of movement. The search is still going on to refine the technique to provide higher resolution and faster image streaming.

How hologram works

- A **laser**: Holography uses red lasers, commonly helium-neon (HeNe) lasers. Some home holography studies use red laser pointer diodes, but the light from a laser pointer is less coherent and stable, making it difficult to obtain a clear image. Some holograms make use of lasers that emit a variety of colors of light. You may also require a shutter to control the exposure depending on the sort of laser you're using.
- **Lenses**: Although holography is frequently referred to as "lensless photography," it does require lenses. The lens of a camera, on the other hand, focuses light, but the lenses employed in holography spread the beam out.
- A **beam splitter**: This is a device that splits a single beam of light into two beams using mirrors and prisms.
- **Mirrors**: These point the light beams in the right direction. The mirrors, like the lenses and the beam splitter, must be spotless. The final image can be degraded by dirt and smudges.
- **Holographic film**: Holographic film can record light at a very high resolution, which is required for hologram creation. It's a translucent surface with a coating of light-sensitive chemicals on it, similar to photographic film. The distinction between holographic and photographic film is that holographic film must be capable of recording minute changes in light over microscopic distances. To put it another way, it must have a very fine grain. Holograms that use a red laser can rely on emulsions that respond [2].

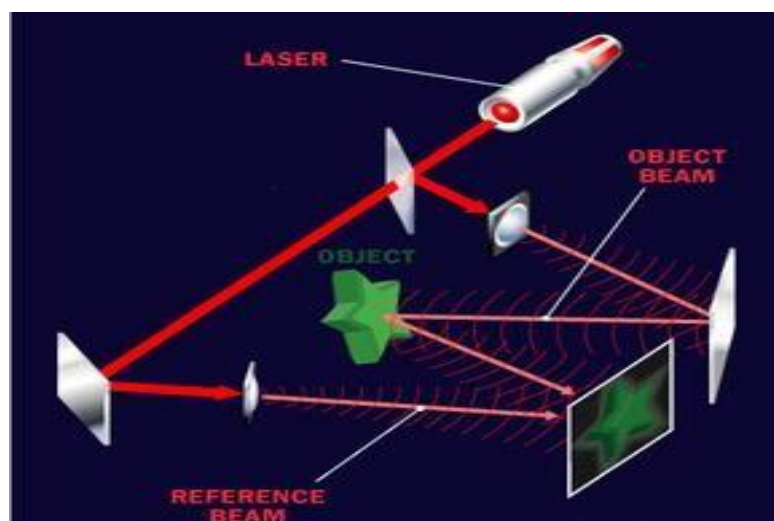


Figure 1: A description of how light is dispersed

Hologram in education

Holograms are an excellent approach to convey information to students in a way that motivates them to learn more. These are some instances of how holograms can be used to convey information to students.

- 1- The Alive Gallery Project in Seoul uses hologram technology to bring 62 world-famous Western paintings back to life. The Mona Lisa can be seen in this project answering questions from kids, such as "Why don't you have any eyebrows?" She responds, "When I was living, a lady with a large forehead was considered a beauty... so most ladies had their eyebrows removed for beauty" [3].



Figure 2: The hologram of Monalisa in Seoul

- 2- Now enable pupils to be taught by a "virtual teacher" who may be thousands of kilometers away. The hologram teacher is in the classroom and can see and talk to the students as if they were all in the same room [4]. Holography varies from video conferencing in that the teacher's whole 3D image can be projected into the classroom and looks to be present. Users can quickly observe the image on a screen from a single camera while video conferencing [5].



Figure3: A hologram of a teacher.

- 3- Sarawak primary school children took part in the research. The efficiency of incorporating 3D holography in the classroom was assessed using a mixed qualitative and quantitative method. Using the SPSS software, the data from both tests were compared and statistically analyzed. For this study on the topic of 'Plant Growth,' a 3D animation hologram was created. It was created in accordance with the elementary school science curriculum.

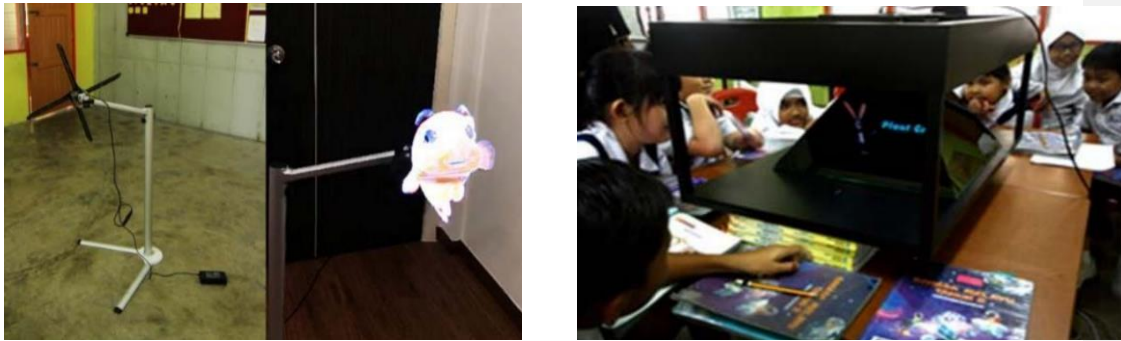


Figure 4: children learning by hologram technology

Both gadgets were evaluated to discover which one was better for generating interest among pupils as well as application in primary school education. The ethnic Chinese made up the majority of the participants, accounting for 38%, followed by Malay (36%), Iban, and Bidayuh (3%). (26 percent). Students improved their grasp of the information offered through learning based on the 3D

holographic animation, as evidenced by a comparison of pre- and post-test results. The use of a 3D hologram animation in the classroom resulted in an improvement in primary school students' knowledge, motivation, and learning achievement. After watching the 3DH cartoon, 72 percent of students improved their scores on the post-test compared to the pretest [6]

Discussion

A questionnaire was distributed about using hologram in education to 400 teachers working in various levels of education in the UK, thus constituting a random sample. According to Oates (2006, p.219) the questionnaire is a set of pre-defined questions to be answered by a number of respondents.

According to the study, 60.8 percent of respondents agreed that 3DHT is an important tool for instructors, and 45.5 percent anticipated that 3DHT will be an effective teaching tool in the future. However, 47.3 percent of teachers at all levels stated that while technology will not transform the face of education, it will assist them in their teaching to some extent [7].

Conclusion

To summarize, a 3D holographic item is a type of optical technology that records patterns in three dimensions. Red lasers, such as helium-neon (HeNe) lasers, are used in holography. Even though holography is sometimes referred to as "lensless photography," it does require the use of lenses. Many schools have recently begun to use three-dimensional holographic technology as a new innovative educational method, with great results.

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