Hologram in Education Field

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ABSTRACT

What is a hologram?

A hologram is a 3-dimensional image that can be seen from any angle. The hologram will show all the visual depth as if it is a real object. The holographic display can be used for educational purposes; It can be used in various science branches like human anatomy, computing, astronomy, etc. First students have the advantage of seeing objects in 3-dimensions. Second students can see the hologram in 360 degrees so students can see and walk around the scene. Third models in actual scale are beneficial for the learning scenario. Fourth Hologram offers an easy mode of teaching and learning so students can understand the concept deeply and also enjoy the way of learning. Those are major reasons of hologram technology can benefit the educational process even though it is not all in one solution

Introduction

Hologram Technology

Holography may be regarding as a technique of acquiring photographic photo in three-dimensions. The phrase hologram is Greek, the basis phrases are holos, "entire"; gram, "message") and translates into 'entire picture'. Holograms range from everyday photographs, due to the fact the holograms report an incredibly correct 3-dimensional (three-D) photo of the unique object. A hologram is a three-dimensional report of the Fantastic interference of laser mild waves. The shape of a synthetic Hologram is fabricated from hundreds of three-D laptop photo pic similar to as a great deal points of view on a 3-dimensional scene. These may be carried out without a lens, this is why is sometimes Referred to as lens much less photography. Dennis Gabor in 1947 had the credit score of dad of holography for theorizing those principles. His write up grow to be the muse of cutting-edge holography. A hologram seems so practical due to the fact it's far an actual recording of the mild waves meditated from the object. Holograms do now no longer generally reproduce the actual colorings of the unique object. The photo's shadeation mainly relies upon at the shadeation of the laser used to make the hologram and is likewise decided through processing methods. Multi-coloured pics are created through the usage of exclusive lasers. The maximum not unusual place kind of laser used is helium-neon (HeNe). Even though a few holograms are crafted from diodes from red laser pointers, they're generally volatile and much less coherent. Although, holography is generally noted as "lens-much less photography," it calls for lenses. Unlike photography, holographic lenses unfold out beamed mild in hologram. The beam splitter is used to divide a beam of mild into two (Wilson 2010).

How Hologram Process

A laser, a beam splitter, two mirrors, two lenses, and the object itself are used in the procedure. The beam splitter separates the light emitted by the laser into two parts. Wilson Prior to the invention of lasers in 2010, the earliest holograms were flat two-dimensional transparencies created from the very slightly coherent light of a sodium vapour lamp. Emmett Leith and Juris Upatienks, both of the University of Michigan, began creating three-dimensional holograms in 1962. Holograms can now be projected in a 360-degree holographic display. As may be seen in fig.1,
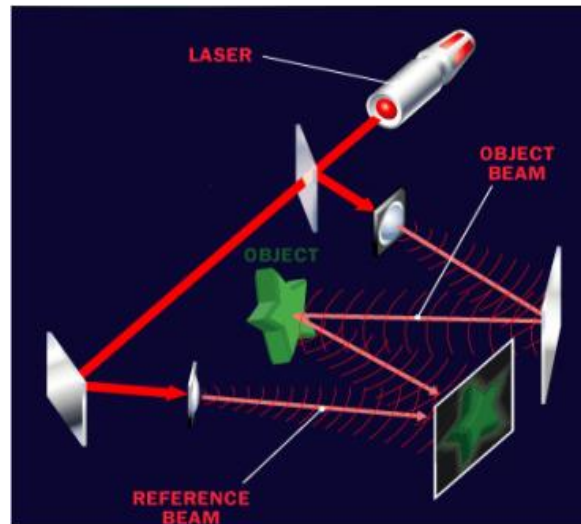
Figure .1

How Holography Works

Holography works by producing the appearance of three-dimensional pictures. A light source is projected onto an object's surface and then scattered. A second light shines on the object, causing interference between the two sources. In essence, the two light sources interact and cause diffrac-tion, which appears as a three-dimensional image. As may be seen in fig.2,
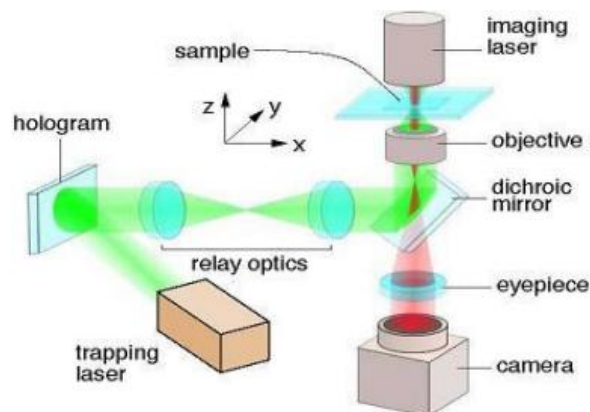

Figure .2

Objective of Hologram

- To comprehend the significance of holograms in our lives as well as in the teaching and learning environment.
- To determine the benefits and drawbacks of Hologram as a teaching tool.

Research Questions

- Will Hologram be an effective teaching tool in the future?
- What challenges can educational institutions face when using this tool?

Purpose of Hologram Education

The goal of this study is to propose new approaches to use holographic technologies in teaching. As a result, the focus of this research is on holography and its applications in education. This study aims to encourage more research and development in the field of holography and its educational applications.

3d Holographic Technology

The word hologram is made out of two Greek words: "holos," which means "complete view," and "gram," which means "written." A hologram is a three-dimensional representation of positive laser light wave interference. Wave front reconstruction is a technical term for holography (Universal-Hologram, 2009). In 1947, Dennis Gabor, a Hungarian physicist working on electron microscope development research, created the basic technology of holography. However, until the 1960s, when laser technology was perfected, the technique was not fully exploited. 3D Holographic Technology (3DHT) was developed by experts in the United States and the Soviet Union in 1962.

However, 3DHT has come a long way since the 1980s, thanks to low-cost solid-state lasers that have been widely available in consumer electronics such as DVD players (Chavis, 2009). 3DHT works by giving the impression of three-dimensional pictures. A light source is projected onto an object's surface and scattered. A second light shines on the object, causing interference between the two sources. In essence, the two light sources interact and generate diffraction, which results in a three-dimensional image. With the rapid advancement of technology, many scientists began to employ 3DHT more extensively. Indeed, scientists were able to move people from one location to another without them having to travel. This sounds like it belongs in a science fiction film or television show. However, similar occurrence occurred during the 2008 presidential election in the United States, when Jessica Yellin from Chicago was 'beamed up' to Wolf Blitzer's studio in New York with a remarkably lifelike display. This occurrence drew millions of people to a YouTube video to see the Hologram effect. In fact, just after the cover-age, "CNN Hologram" was the 22nd most searched term on Google (Welch, 2008). Musion System Company's 3D holographic display technology was smoothly combined with Cisco's Telepresence system to provide the world's first real-time virtual presentation (Musion System, 2009). As a result, 3D holograms have broken free from the realms of science fiction and fantasy, and are on their way to becoming common money in a number of countries around the globe. Whether it's a band performing on stage, a politician giving a major address, or a CEO holding an interactive conference with colleagues around the world, live and life-size 3D Telepresence holograms may now interact with their remote audiences.

Holography in Furture Education

Constructivism emphasizes the need of improving open learning enjoyment and via doing. Nonetheless, significant progress has been made in the field of ICT use in learning environments over the last two decades. Many educational institutions have integrated ICT services into their various academic departments as a result of the benefits afforded by ICT in the education sector.

Particularly in wealthy cultures and a small number of third-world countries. These quick improvements have resulted in significant changes in a variety of sectors and endeavors, including life education. As a result, educational institutions swiftly incorporated constructivist technological services into education, resulting in new educational models such as eLearning, m-learning, interactive learning, and blended learning. Technological advancements have recently played a vital role in improving the teaching process, particularly the incorporation of holographic presentations within the classroom. Holography will undoubtedly benefit studies into virtual office concepts and video conferencing. Educators, students, and business trainers will prefer those who research holographic technologies. Avatars can be used to help children with eLearning. This will aid teaching in overburdened classrooms while also increasing student learning. However, no educational institution has used or even attempted to use holography as a course or as a practical experience in the teaching and learning process. The art of overcoming 'fears of public speaking' was defeated. Instructor training in digital holographic classrooms could aid new teachers in adjusting to a real-life classroom scenario (Winslow, 2007). Of course, virtual artificial intelligence tools or holographic assistants can take numerous forms, including 'one on one' interactions with holographic avatars or adult instruction in real-life simulations. A guest speaker may be invited to talk in a college class, and virtual holographic speakers should be less expensive than actual speakers in the near future because there is no chance of flight, no hosting, and no feeding. Presentations and demonstrations on distance e-learning initiatives where Holographic pictures are broadcast/beamed over the internet would be possible sooner and more widely. Technological advancements have recently played a significant role in improving the educational process, particularly the integration of holographic presentations in the field. E-learning, m-learning, interactive learning, and blended learning are examples of modern educational paradigms. With such tools, teacher training in virtual Holographic Classrooms could help new instructors adapt to a real-life problem classroom. As far as we know, holography has previously been put to the test in educational institutions. Even in advanced countries, holography is still in its infancy and is not frequently employed in education. However, holography in education is not a new concept; it has been utilized in the past in a school, but technological limitations have limited its use. A hologram of Catharine Darnton, a Mathematics teacher, was successfully transmitted into an exhibition center in a South London school in the year 2000. Although, the distance of transition was minimal, long distance projection is possible since the images are transmitted over the internet.
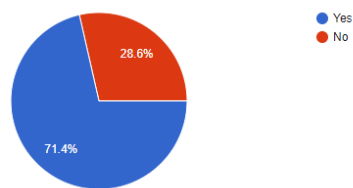
Survey Results

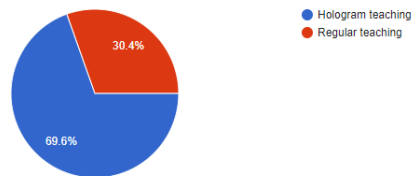Do you know about Hologram ?

23 responses

● Yes
● No

8.7%

91.3%
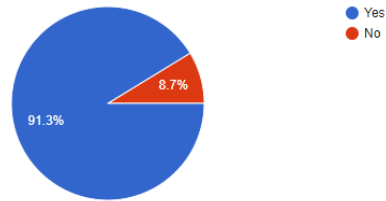
Do Hologram exist in real life ?

21 responses

● Yes
● No

28.6%

71.4%

What kind of teaching you prefer hologram teaching or regular teaching ?hologram teaching / regular teaching ?
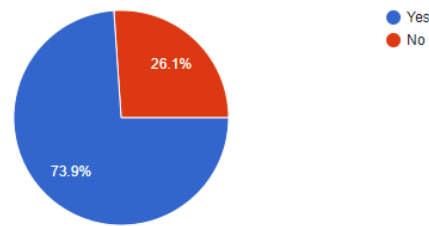
23 responses

● Hologram teaching
● Regular teaching

30.4%

69.6%

What do you think In future how many chances that hologram will be implemented in our teaching ?

23 responses

● 10% - 20%
● 20% - 30%
● 30% - 40%
● 40% - 50%

30.4%

39.1%

26.1%
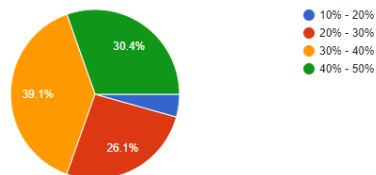
Is hologram cost effective solution and can we use it in our lives ?

23 responses

CONCLUSION

Perhaps hologram era will guide the getting to know technique although it isn't always a "one length suits all" solution. Preliminary results strongly suggested Holograms will support the learning process. Indeed, the learning process is enhanced by allowing the student to see an object with a sense of reality, from any angle, in three dimensions. Keep in mind: issues will arise with the introduction of any new technology in the classroom: (a) equipment failures, (b) loss of electrical power, (c) bulbs burning out, and (d) parts breaking into pieces. These problems can lead to downtime. Furthermore, to truly understand the benefits of holography one needs to examine the costs versus the benefits.

ACKNOWLEDGEMENT

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