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The Reality of Using the Hologram in Teaching by Faculty Members

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Abstract

This study aimed at finding out the reality of using the technology of hologram in teaching by faculty members and the factors that contribute to shaping this reality via a descriptive-analytical methodology. The results showed that hologram was not actually used in teaching, despite the desire and enthusiasm of faculty members to use it. In conclusion, in educational technology, the idea of hologram technology comes with a virtual reality design about the extent to which the learner can enter a realistic world created by default.

Keywords: Holographic, Technology, Image, Photography, Reality.

La realidad del uso del holograma en la enseñanza por miembros de la facultad

Resumen

Este estudio tuvo como objetivo descubrir la realidad del uso de la tecnología del holograma en la enseñanza por parte de los profesores y los factores que contribuyen a dar forma a esta realidad a través de una metodología descriptiva-analítica. Los resultados mostraron que el holograma no se usó realmente en la enseñanza, a pesar del deseo y el entusiasmo de los miembros de la facultad de usarlo. En conclusión, en tecnología educativa, la idea de la tecnología de hologramas viene con

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un diseño de realidad virtual sobre la medida en que el alumno puede ingresar a un mundo realista creado por defecto.

Palabras clave: holográfica, tecnología, imagen, fotografía, realidad.

1. INTRODUCTION

One of the most important challenges facing the teacher is the ability to design an interactive learning environment that responds to learners' needs, motivates them and stimulates their interest in learning. In recent years, there have been many rapid developments in the field of educational technology and multimedia that have made a big difference in the teaching process because of their characteristics. They provide an interactive learning environment that helps student emerges from the world of traditional learning and move him into an enjoyable learning world characterized by flexibility, knowledge creativity and discovery (OKTARIANA, 2014). Therefore, many countries are rethinking their educational systems to match the age of information technology and communications in 2015, New Medium Consortium (NMC) researchers reported on the results of technology that should be applied to higher education institutions over the next five years. They discovered that the most important field for research focus was the development of learning environments that drive innovation and increase cooperation (GOLDEN, 2016; ASAD, SHABBIR, SALMAN, HAIDER, & AHMAD, 2018).

Modern technology offers new opportunities for learning and communication by activating its many innovations as aids in teaching and learning processes. The virtual reality of these innovations that refer to the environment of three – dimensional work to reflect the abstract concept using simulation and thus enable the learner to interact with and integrate into it SALVETTI & BERTAGANI (2014) also focused on a new learning environment called enhanced reality lab, using technology that targets human senses. In this new environment, students were immersed in augmented reality that proved to have a positive effect on students learning (SHABBIR, ABBAS, AMAN, & ALI, 2019).

In 1947, Hungarian physicist Dennis Gabor discovered the basic technology of three-dimensional photography. But it was only used in the 1960s when 3D image technology was introduced in 1962 by scientists from the United States and the Union of Soviet Socialist Republics. This technology has evolved significantly since the 1980's thanks to the low – cost solid laser devices that are available to consumers such as DVD players (MOHAMMAD & YOUSIF, 2009). The term hologram comes back to Greek. Holo means comprehensive vision and Gramma means written (NAYDENOVA, 2011). The hologram is a three – dimensional imaging that records the light in an object to give the shape of this body to float as a three – dimensional object. This process is performed using lasers. The images of the hologram are composed in the three – dimensional space, not on the surface, not on a solid object or on water. They are very clear images, and there is the possibility of containing them in the movement

element, and you see the person in front of you (AL – KAHTANI & AL – MOEATHER, 2016).

2. METHODOLOGY

Due to the nature of the study, the researcher used the descriptive-analytical research methodology which was based on describing the reality of the use of hologram in teaching and the factors that formed this reality by interviewing a representative sample of faculty members at the Middle East University – Jordan and analyzing the results of these interviews.

Three faculties – engineering, media and architecture, and design – were chosen intentionally from nine faculties, because they are most closely related to hologram technology. A random sample of faculty members was selected by (20%) of the total faculty members in each faculty. The total number of respondents totaled eight individuals distributed as follows: Faculty of engineering, faculty of media and faculty of architecture and design (HACKETT, 2013; MAHMOOD, ARSHAD, AHMED, AKHTAR, & KHAN, 2018).

Due to the nature of the problem of the study and in light of the questions that started the study and the methodology of the study, and to achieve its objectives, a standardized interview was used. The researcher prepared its questions. There are (10) questions as follows:

1. Have you heard of the hologram?

2. Classify your knowledge of hologram (High, Medium, Low).

3. Define hologram?

4. Based on your knowledge, what are the fields of using hologram?

5. Have you used hologram in teaching your students?

6. Do you want to use hologram in teaching your students?

7. In your opinion, what the reasons for the scarcity / non – use of hologram in teaching?

8. What do you think you need to use this technology?

9. List topics that the use of hologram can help you teach?

10. What does the Middle East University recommend to apply this technology in teaching?

In order to ensure the validity of the content of the interview questions and to find out the relevance of the interview topic and the accuracy of language and clarity, it was presented to three faculty members in educational technology, and curricula and teaching methods. The wording of the second and ninth questions was amended. To ensure the reliability of the interview questions, the following steps were followed:

- Interview a four-member survey faculty from the faculties selected in this study who are not members of the study sample. The questions were asked individually. Each time the response is recorded, it is printed using a word processor.

- After two weeks the interview was repeated on the respondents themselves using the same questions and recorded the answer of each of them printed using the word program. After comparing the responses of the respondents in both times and calculating the Pearson correlation coefficient between the two applications, the value of the coefficient of reliability was (0.95). The Cronbach – Alpha equation was used to measure the degree of internal consistency of the interview questions and found that the coefficient of reliability was equal to (0.92).

After confirming the validity and reliability of the interview questions and identification of the sample subjects of the study randomly, each person was visited in his/her office to clarify the objectives of the study and take approval for the interview. Everyone agreed to the interview. A schedule of interviews was set according to the time available for each participant. The interviews took five days, which took place within one week from 6-10 July 2019: two days in the faculty of engineering, one day in the faculty of media and two days in the faculty of Architecture and design. The interview was limited to (30) minutes per session. The interviewer asked each question to the participant and recorded his answer on a special form prepared by the researcher to facilitate the collection of answers and analysis later. Each form was filed electronically in the name of the interviewed individual.

3. RESULTS AND DISCUSSION

The first question: What is the reality of the use of faculty members in the Middle East University – Jordan – hologram technology in teaching? To answer this question, the answers to the study sample to questions (1-6) were analyzed as follows:

All respondents heard about the hologram because the study sample was selected from the most closely related faculties using technology in teaching. The faculty members in these faculties are always aware of technological innovations because the nature of their specialties needs to do so through the follow – up periodicals or attend scientific conferences. But the degree of their knowledge of this technology ranged from medium to low. Fifty percent of the total sample were medium and 50% were law.

At the faculties' level, all members of the faculty of engineering sample were low and all members of the faculty of architecture and design were medium. As for the faculty of media. One of them was medium and the other low. This may be due to the fact that the applications of this technology in the field of architecture and design outweigh the use in engineering. In addition, students of the faculty of Architecture and design study this technology theoretically through the course of advanced architecture technology. In the faculty of media, the degree of one of its members was medium because his specialization in radio and television. Hologram applications have become present in some international and regional satellite channels and have an application in one of the local satellite channels.

In the definition of the term hologram, and after analyzing the answers of the respondents of the sample, there is knowledge of the characteristics of this technology, as they all know it as a three – dimensional photography and by 100%. Four of them described it as a simulation of reality, and by 50% of the sample. Three of them described it as an animation or animation of the body at (37.5%). In addition to the knowledge of some of the educational characteristics that can be useful in the use of hologram, such as one person described it as it has more excitement and attraction to the recipient. Another replied that it was working to expand the student's imagination. These qualities are consistent with ZAKI (2017) & GHULOUM (2010) studies. Another said it was an aesthetic and simplistic thing that communicated the message in line with the fast language of the times. These characteristics reflect the degree of knowledge of each member of the study sample on the hologram. These definitions may be due to the nature of each member of the sample from his/ her own angle related to the application of hologram in his/her field of specialization.

With regard to the fields of the use of hologram in life, analysis of the answers of the respondents to the fourth interview question shows that they have good knowledge about its applications, in various fields of medical, industrial, military, commercial, media, engineering, architecture and design, sports, cinema, theater, environment, and health. This is due to the fact that the members of the study sample from faculties have a strong relationship with the use of technology. They have a desire to know what is new from its applications in public life, especially with regard to their specialties.

This is generally an important issue for every faculty member, to keep abreast of what is new in his/her field and thus can interact with the generation of students, that technology and its uses have become his basics.

As for the use of hologram in teaching, there was no practical use of it by any member of the study sample. Six of the respondents answered at (75%) they never used it. One of the faculty of engineering used in one lecture through a video presentation to his students used the hologram to illustrate a pipeline. And one of the faculty of Architecture and design taught the concept to his students theoretically through the course advanced architecture technology.

As for the extent of the desire of the sample of the study to use the hologram in teaching was present to everyone. This corresponds to the studies of (AHMAD, ABDULLAHI & USMAN, 2014). Six of the sample subjects answered at (75%) yes, strongly, and one answer yes, strongly in the topics useful to use the hologram in their teaching and one answer yes, if the necessary training and equipment are available.

The second question: What factors contribute to the formation of this reality? Through the previous presentation of the reality of the use of faculty members at the Middle East University – Jordan – hologram technology in teaching, which showed that the members of the sample do not use hologram in teaching, although there is a theoretical knowledge about it among the sample members and they have knowledge of the fields of use in life. There is also a strong desire to use it from all members of the study sample, but there are reasons

for not used by them in teaching were limited by their answers to the seventh interview question and were as follows:

Difficulties: The lack of necessary equipment occupied the first rank, as four of the study sample, with a percentage of (50%) considered a reason in the case of non – use, this corresponds to the difficulties that came with the study of (SWEDAN & SHARAF EL – DEEN, 2017). This is followed by insufficient knowledge of the hologram in three of them, (37.5%). They came in the third rank: Non – holding workshops on the hologram, and its high financial cost, which was mentioned by two of the respondents at a rate of (25%). This was consistent with the studies of (SWEDAN & SHARAF EL – DEEN, 2017). In the last rank mentioned by one of the respondents and with a percentage of (12.5%) all of the following reasons: The absence of a fellow person conveying this experience, or some of the materials taught by the sample members is theoretical and do not need to do so, or the existence of alternatives in the presentation and output, but not in the implementation, such as scenography.

The study sample needs and requirements that help them to use the hologram in teaching were identified through their answers to the eighth interview question which were as follows: Training and workshops and the provision of equipment and materials in the first rank and 100%. It is followed by the third rank with (25%): Providing suitable presentation halls, books, references, and guidelines. And came in the fifth rank and by (12.5%): providing the necessary financial cost, as well as informing faculty members of models using the hologram and the need to provide time for the faculty member to

use this technology and the encouragement of officials at the university to use the hologram.

Aspirations: If the university meets the requirements of the study sample, it will help them to teach the following subjects and topics, which were identified through their answers to the ninth question in the interview:

In the field of engineering: Roads and construction, water and environment renewable, energy properties of engineering, materials, solar energy and traffic engineering can be used for road pavement and material testing. In the field of architecture and design: Advanced architecture technology, landscape design, architectural design, sanitary and occupational health construction, structures interior basics, interior design, works and objects, lighting and acoustics in interior design, interior gardening and technical equipment for the building.

In the field of media: In all theoretical and practical courses specializing in radio and television, Journalism design, web design, video advertising, radio and television montage, photography digital media, blogging and internet journalism.

4. CONCLUSION

This study investigated one of the uses of hologram technology, which is one of the achievements of modern science. Digital technology has a unique characteristic that enables it to

recreate the image of the original objects with their three dimensions and to a very high degree in space based on the laser and the principle of interference. This technology has not been recognized and used optimally so far, despite the modest uses by some news agencies and in advertising, architecture, interior design, furniture, fashion design, credit cards, and packaging.

In educational technology, the idea of hologram technology comes with a virtual reality design about the extent to which the learner can enter a realistic world created by default. It is a three – dimensional imaginative industrial medium that resembles the real reality so that it embodies the abstract concept using simulation, by designing an interactive learning environment that meets the needs of learners and motivates them and stimulates their interest to integrate into the learning process.

Lectures can also be held in multiple classrooms to take advantage of the same teacher for all classrooms to save time, effort and money. Or revive famous figures who lived in the past to speak for themselves. Therefore, this study sought to highlight the importance of hologram technology and its role in the development of teaching and learning by studying the reality of the uses of faculty members of hologram technology in teaching and the factors that contribute to the formation of this reality. To achieve this, a descriptive-analytical methodology was used through a standardized interview with a random sample of eight faculty members selected from the faculties of engineering, media and architecture and design at the Middle East University – Jordan.

The results of the study showed that the hologram was not practically used in teaching, despite the desire and enthusiasm of the faculty members using it. This is due to a number of reasons, the most important of which are: the lack of training to use this technology, the lack of suitable equipment and the lack of knowledge of the faculty members in hologram technology. The study recommended that the Middle East University starts holding workshops for faculty members to use the hologram and provide the necessary equipment to be the first Jordanian university to use in teaching.

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