

Designing an Educational Unit Using Hologram Technology in Basic Skills Basketball and Measure Impact on Application Model

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Abstract

The study aimed to design an educational unit with stereoscopic imaging technology (Hologram In the basics of basketball and measuring its impact on the application of the model, to achieve the objectives of the study, a sample application test was prepared. The sample of the study that was chosen by the intentional method consisted of students of the Faculty of Physical Education at Yarmouk University of (60) students of the basketball course. The study sample was distributed randomly into two groups: an experimental consisting of (30) students who were taught using the technique of stereoscopic imaging) Hologram ,(and a control consisting of (30) students who were taught in the normal way, and the results of the study showed a statistically significant difference in the overall performance of the students of the two groups. In the application test of the model, in favor of the performance of the experimental group students who studied the stereotaxic technique educational unit .

Keywords: hologram technique, basic skills, basketball, modeling.

Introduction

Undoubtedly, technological and scientific progress has a prominent role in increasing sciencefiction day after day in order to keep pace with the progress resulting from the technological revolution that the world is witnessing, which requires keeping pace with the changes that occur in the field of sports education, especially in the field of curricula and methods of education basketball , In order to coexist with the challenges facing the twenty-first century, and the responsibility rests on scientific education and teaching physical education in preparing the student who is able to assimilate and deeply understand information, by reconsidering the teaching of physical education, and searching for modern methods and strategies that increase the comprehension of Concepts and facts.

Curricula are the effective tool in building the personality of learners, and it seeks to meet the hopes of future generations, and the teaching of physical education is witnessing clear progress at the

global level to keep pace with the scientific and technological developments that have occurred, and this progress is derived from the nature of sports sciences, science has its structure that distinguishes it from other branches (Mosleh, 2010).

Physical education courses play a major role in the progress and prosperity of nations in all areas that are concerned with individuals and societies, as the progress, development and prosperity of any nation depends primarily on its educational system. In recent times, the world has witnessed many developments and efforts to develop curricula and reform the educational system, starting with From the goals through the content and teaching methods, to their evaluation, and the evaluation of their educational outcomes (Zaitoun, 2010).

Hence, it is imperative to use modern and more advanced means, methods and technology, especially those that depend on perception and tangible experiences, and encourage students' participation and greater integration in the educational process, which calls for the search for new programs and methods that enhance the use of technology in education (Ahmed, 2019) .

Rapid developments in information and communication technology have brought about tremendous changes in many areas of life, so educational institutions have been quick to benefit from technological services by integrating information and communication technology in education, and this in turn has produced new models of education that have changed the face of learning, and in recent times developments have advanced Technology has an important role in improving education, for example many educational institutions use advanced technology, such as touch screens, and here hologram technology came as a new tool that can support teaching and learning in educational institutions (Ghuloum, 2010).

Despite the recent application of hologram technology in education, its roots go back to the illusion known as the " pepper ghost ," which was used in Victorian theaters in the sixties of the nineteenth century to produce realistic ghosts, through a series of visual projections, such as placing a huge sheet of glass plate On stage at a 45-degree angle with its own screens and lighting (Lee, 2013).

And in the nineteenth century, specifically in the year 1862 AD, several attempts emerged to obtain a three-dimensional image, as the British scientist " John Henry Pepper " succeeded in presenting his theory of the formation of three-dimensional light objects, which bore his name " Pepper's Ghost " because it depends on the use of mirrors oblique angles, to share reflections image objects appear floating inHawaE (Awad, 2017).

It can be said that the date of the emergence of the " hologram " technology goes back to 1947 AD, by the Hungarian engineer " ,Denis Gabor " in an attempt to improve the magnification power in the electron microscope. And because the light resources available at that time were not really coherent and monochrome, hence the advent of stereoscopic imaging until the time of the advent of lasers in 1960 AD, and in 1962 scientists from the United States and the Soviet Union invented stereoscopic imaging technology (Hariharan, 2002).

Experiments continued, so the first hologram was shown to a person in 1967, and in 1972 the scientist Lloyd Cruz was able to manufacture the first hologram that combines three-dimensional holograms and two-dimensional graphics cinema, and in the early eighties of the twentieth century,

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laser light was used to record holograms in the United States of America and the Soviet Union at a time Approximately one, and since that time, the interest in developing hologram technology has begun to enter into multiple scientific and industrial applications (Awad, 2017).

It is clear from the above, that the hologram technology is new, but the idea was old, and it developed clearly with the development of research on hologram technology. The hologram is a term from the Greek language consisting of two syllables, holos, meaning "complete vision", meaning "written", and the hologram is a three-dimensional record as a result of positive interference between laser waves (Universal Hologram, 2009). The hologram principle is based on a three-dimensional holographic imaging, which is a bundle of light waves that collide in the body to be photographed and map it, then the light waves transmit the body's data (Al-Qahtani and Muaither, 2016, 234).

Hologram technology is defined as "a three-dimensional image formed by the light of an object that it projects into a vacuum, and it can be viewed directly in three-dimensional image that can be displayed on an aluminum plate or foil (Lobo, 2016, 16661).

The hologram technique can be defined in this study as: a three-dimensional hologram resulting from the reflection of laser rays in a vacuum, so that it can be seen from all directions and clearly to facilitate the teacher teaching the models that are difficult to display to students.

The distinction between hologram technology and other virtual reality technologies is that the hologram image is formed in space in the form of a three-dimensional illusion, not on a wall or object, and is clear to see, as if the image in front of you is completely opposite to virtual reality technologies (Zaki, 2017).

The hologram image is formed by creating an illusion of a three-dimensional image, where the first light source illuminates the shape, the second light is illuminated, and the two light sources interact with each other, and the interference causes a three-dimensional image to be created, that the idea consists of a three-dimensional image and is implemented using a laser beam through An object projecting a second ray on the reflection of the first ray, allowing to create a three-dimensional optical illusion image (Orocs, 2018).

Whereas the idea of holography as mentioned by Ghulam (Ghuloum, 2010) is as follows: directing the laser beam to the light divider that separates the laser beam into two beams, and mirrors are used to direct the path of the two beams to the specified target, and both beams pass through a dispersed lens to turn A focused beam of light into a wide beam, directing one of the two rays to the object to be photographed, and we call this ray the ray of the body, so the ray is reflected from the body and falls on the film .

(Al-Qahtani and Al-Muaither, 2016) mentioned how the hologram works in the following: directing the laser beam to the light splitter that divides the laser beam into two beams, and directing the path of the two beams to the target specified for you using mirrors, and both rays pass through a dispersed lens and the focused transmitted light beam turns into a beam One of the two rays is directed at the object to be photographed, and the body ray is called the Object Beam, so the ray is reflected from the body and falls on the film, and the ray that is directed to the film using mirrors is called the reference beam.

Regarding the importance of employing hologram technology, many researchers have indicated that it can be employed in the field of education, especially after it has proven effective in the fields of marketing, advertising, media, medicine and engineering, where this technology can be used. (Orocs, 2018) showed that technology plays a positive role in Acquiring new educational applications, and that the possibilities of hologram technology are an undeniable reality in mathematical sciences and learning contents.

Hologram technology has the potential to revolutionize the aspects of teaching and learning, and hologram technology may become a resource that can change the way knowledge is created and exchanged, and 3D holographic technology can be effective in learning and teaching, and this type of technology enhances the student-centered environment, where It enables students to interact with their own learning environment and build their knowledge based on their educational experiences (Lee, 2013).

Hologram technology contributes to the field of education in different ways: the ability to present a convincing and realistic presentation to the user, the ability to communicate with users in different locations, and the ability to communicate attractively (Kalansooriy, Marasinghe & ,Bandara, 2015). The hologram technology also contributes to increasing the mutual interaction between the teacher and the learner in the educational process, in acquiring new teaching skills, increasing the motivation to learn, and helping to employ modern technologies in education, and it also contributes to highlighting the experiences of scientific thinking .

And hologram many of features that can be utilized in field education, including technology provides access space for students to watch video scientific experiment in three dimensional, and give them virtual to three dimensional historical sites difficult visit in fact (Abdul Hadi, 2017).

It also keeps the learner away from feeling bored during the learning process. Rather, it makes him part of the scientific event through his sense of control over the body. This generates motivation, focus and attraction to educational content (Muhammad, 2019). And enable him to see the stereoscope from all directions, and then produce a realistic picture of the learner. Because it is an accurate recording of the light waves reflected from the body) Ahmad, Abdullah & Abubakre, 2015, (it is an advanced technology through which the resulting images can be viewed easily without the need for glasses, so that it attracts the learner to the 3D hologram (Hayek, 2015).

The hologram technology has been recognized as a tool to enhance the educational process, as it does not need a display screen to view the holograms, and to see the whole body from all directions, and when you see one side, the other side disappears, for example if we see the right part of the body, the left part disappears, and memory provides To store the pictures and shapes you want to view (Baby, 2013).

"The reflection hologram"

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This is the most common type in exhibitions, in which the reflection image appears in a three-dimensional form of incandescent light (hologram). This type in the educational context has recently received the interest of researchers in conducting experiments that visualize students, as they do not need internet to display them. So that the device contains memory to store the video or image to be viewed, so that it appears in the space in three dimensions (Barkhaya&Halim, 2016).

"Transmission holograms"

The typical hologram transmitted with laser light of the same type used in the recording is viewed. The laser light is directed from behind the hologram and the hologram image is transmitted to the side of the viewer. The hologram transmitted in this way has depth, and it can be used. Of this kind in the field of education by broadcasting a live picture of the teacher explaining the lesson anywhere in the world, where a number of students are present and feel as if the teacher is already with them and begin to interact with him (Lobo&Anil, 2016).

Computer Generated Hologram,

which are images capable of creating a lot of holographic illusory reality resulting from observing the sizes of objects by the naked eye, and Babi (2013) indicated that the hologram image through the computer has the advantage that the things that a person wants to show, and not It must possess any physical reality to show it It must not possess any physical reality of it at all, and in this case it is called (fully artificial holographic generation) .

Although the hologram technology has great importance in the educational process, it faces like other technologies. some challenges, as agreed(Bobolicu, 2009)that hologram technology faces some challenges, including: high cost, and need for high-speed internet, and need for appropriate tools and equipment for application.

indicated questionnaire conducted by (AlQahtani and Muaiter, 2016) to The difficulties facing the application of this technology in education” ,the officials ‘lack of awareness of the role of hologram technology in education and the financial and material costs that make it difficult to integrate technology into the educational process.

That despite the high cost of the technology, it is possible for students and teachers to accept that cost in exchange for some advantages, including: forming realistic and convincing views of the study materials, placing holograms within the reach of the teacher, and providing an environment of attractive and effective interaction between the teacher and his students (Pradeem&Ashu, 2015).

The researcher believes that these challenges were influential in the past, but nowadays they have little impact, as the Internet is available to everyone at the present time and very quickly, and also the use of this technology has become inexpensive nowadays, which prepares students to view pictures in an enjoyable way. While saving time and effort, and feeling the desire to see the solid figures in science.

In light of what the educational literature indicates in the field of learning and education that the educational system in the Jordanian universities is based on the traditional method that includes

providing information to students by indoctrination without provoking their thinking and contemplating the information provided to them, especially since we are in the age of technology, and this requires reflective thinking about the problems and experiences that face Students in their lives, and it requires improving the quality of thinking and its capabilities among students at all levels of education; Because the greater the learner's ability to think in a correct, scientific and logical manner, the more increased his ability to work effectively in society (Al-Sa`ida, 2016).

The study problem was represented by the following main question:

What is the effect of designing an educational unit with a stereoscopic technique (Hologram) on the basics of basketball and measuring its impact on the application of the model?

And emanated from the main question the following sub-questions:

Hypotheses of the study

The first hypothesis: There is no statistically significant difference at the level of significance ($\alpha = 0.05$) between the two arithmetic averages of the performance of the basketball education course students in the two study groups on the application test of the model due to the teaching method (designed with HOLOGRAM technology, the normal).

The importance of the study

follows the importance of this study from two aspects:

First: The theoretical aspect: This study is expected to design an educational unit based on stereoscopic imaging technology, with the aim of contributing to the process of renewal and diversification in the method of learning and teaching used by members of the teaching staff at Yarmouk University through a technological technique that stimulates Their interest in reviewing traditional practices in education, and it also contributes to filling the deficiency in Arab studies, and contributing to the enrichment of education through hologram technology in Arab studies and research in general and in Jordan in particular, as the subject did not take its right appropriately in Arab studies and research within the limits of the researcher's knowledge. In curricula and methods of teaching basketball.

Second: The practical aspect: the study is represented in helping planners of basketball education courses in planning the basketball course in the light of hologram technology, preparing study units by course developers based on hologram technology, and directing members of the education authorities to the necessity of teaching basketball according to the approach of hologram technology from In order to develop students' scientific and mental capabilities.

Study terms and their procedural definitions

Hologram technology: a three-dimensional holographic imaging with a very high degree of accuracy and clarity, as it is a bundle of light waves that collide with the object to be photographed and plan it, then the light waves transmit the body data that the tool has planned for the three-dimensional planning

) Universal Hologram , 2009.(

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It is defined as a procedure: a three-dimensional imaging, so that this three-dimensional imaging is transmitted in front of the student, through which the learner can see the image as if it is in front of him, but he cannot touch it, and the educational material (genetics) for the eighth grade has been transformed into light in the form of a three-dimensional image.

Table (1) previous studies

| results. | sample | goal | study |
|--|--|---|-----------------------------|
| The research indicates that 3D holographic projection technology could be integrated into the mobile game application with necessary technical support, which is currently under constant development by looking at the virtual reality and augmented reality trend. For the case company, this technology can be used to innovate and develop mobile game applications, which helps the case company increasing its attractiveness and draw users' attention. Currently, | he case company owner was interviewed to collect empirical data in order to identify the business requirements in the mobile game application market. | explore the possibilities and methods of 3D holographic projection technology integrated into mobile game applications for the case company 'From The Bench SL' located in Elda, Spain. |)Li & ,Li, 2018(|
| barriers facing hologram technology are that it is expensive, It needs high-speed internet, and (60.8%) of the respondents emphasized the importance of the hologram as an effective educational tool for teachers, and (45.5%) believed that it would be an effective educational tool in the future | (400)teachers working in various levels of education in the United Kingdom. The | understand the importance of hologram technology in our lives and in the learning and education environment in particular, and identify the strengths and weaknesses of technology as an educational tool |)Ghuloum, 2010(|
| There are statistically significant differences between the mean scores of the two experimental groups in the cognitive achievement | (50)students in two experimental and control groups. | impact of the interaction between the style of displaying 3D graphics and the method of controlling them in | Abdul Rahim (2012) The |

| | | | |
|---|---|--|-------------------------------------|
| of scientific concepts when presenting the content through multi-media educational computer programs Based on 3D graphics | | programs The educational computer on achievement and correcting the wrong perceptions of scientific concepts in the biology course for high school students in Egypt | |
| .Stereoscopic imaging can be used in education, and that there is a positive relationship between holography and the promotion of teaching and learning, and that hologram technology can be a future tool in all Endeavors of mankind. | (100)teachers are distributed among (12) educational institutions in Nigeria | ,innovative methods such as Acceptance of holography in education among Nigerian colleges of education |)Ahmad, et al, 2015(|
| Increase the interaction of students with the scientific subject in the presence of three-dimensional techniques and digital educational media, and that students use them better than traditional books | (500)students | application of three-dimensional techniques to the design of educational media to raise their effectiveness | Al-Fiqi, Saleh and Saeed (2014) The |
| that hologram technology is important in education, expressing their satisfaction with the ability of hologram technology to improve classrooms. | (50)categories of undergraduate academics and IT professionals from Sri Lanka | assessed the applicability of hologram technology as an enhancer for distance learning |)Kalansooriya et al, 2015(|
| slightly increasing the average for the results of the experimental group on the results of the control group, and that most students are looking On new methods of learning | (70) first-year students in medicine at Kaiser University, USA, | Determining whether the use of holograms in the educational process increases learning outcomes for students | (Golden, 2016) |
| no statistically significant difference between average degrees The experimental group and the control group members in the post | (80) middle school students in Egypt. | impact of a proposed unit strategy in science education reinforced by hologram technology and its impact on conceptual | Zaki (2017) The |

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| | | | |
|---|--|--|---------------|
| application, the logical reasoning test, and the technological enlightenment scale | | comprehension, development of logical thinking and geological enlightenment among first-grade middle school students | |
| students have improved visualization skills when using the hierarchical pyramid, and that the hologram pyramid has a positive effect on students' visualization skills, and that they have the ability to use it In the classroom | (50) members of the fourth year from a local school (36 males, 14 females) | Training students on spatial visualization skills using the hologram pyramid for students of (10) years old | (Ahmad, 2017) |

Study methodology The

present study, which is of a quasi-experimental design, was conducted; According to the design of the experimental and control groups, where the experimental group was subjected to an educational unit using stereoscopic imaging technology, while the control group was taught the same educational unit in the normal way.

study members

aret study students courses basketball education inFacultyPhysical Education at Yarmouk University's 190 studentsaccordingtheir statistics for the academic year (2020/2021) andwas determined study sample ofcourses teach basketball, facture searcherstudying in this College, was chosen from amongtwo divisionsrandom people availablecollegeway, andidentified onethem to beandnumberexperimental group students (30 students), andother control group students (30 students).

The equivalence of the two study groups in the pre-model application test

to verify the parity of the two study groups in the pretest. The two arithmetic averages and the two standard deviations were calculated for the performance of the pre-study sample on the model application test vertebrae according to the educational unit (stereoscopic imaging technique, the normal), and Table (2) shows that.

Table (2) The

two arithmetic averages and the two standard deviations "of the performance study sample on the sections of the comprehension test of concepts according to the teaching method. The two arithmetic averages of the performance

| of the standard deviation of the | mean | group |
|----------------------------------|------|------------------|
| 3.922 | 10.0 | pre-experimental |
| 3.720 | 9.57 | pre-normal |

It is evident from Table (2) that there is an apparent difference between the study sample to test the application of the model according to the method of education, and to know the statistical significance of the apparent difference, use the (t) test for two independent groups (t-test for two independent test), as shown in Table (3).

Table (3) The

results of (T) test for two groups. independent comparison of performance study sample to test application model, according to method education

| statistical significance | degrees freedom | value "v" | standard deviation | average arithmetic | group |
|--------------------------|-----------------|-----------|--------------------|--------------------|--------------|
| 58.662 | | 0.439 | 3.922 | 10.00 | experimental |
| | | | 3.720 | 9.75 | Normal |

Given the results in table (3) we note that value (v) method education amounted (0.439) terms statistical (0.662) which greater than level Statistical significance ($\alpha = 0.05$), which indicates that there was no statistically significant difference in the performance of the two pre-study groups on the application test of the model. In the sense of equivalence (verification of experimental control) of the two groups of study on the application of the model test, and for more statistical control, the accompanying analysis of variance (ANCOVA) was used.

Presentation of the results of the first question: What is the effect of designing an educational unit with a stereoscopic technique (Hologram) on the basics of basketball and measuring its impact on the application of the model?

From this question emerged the following null hypothesis: "There is no statistically significant difference at the level of significance ($\alpha = 0.05$) between the two arithmetic averages of the performance of students of the basketball course in the two study groups on the application test of the model attributed to the teaching method (designed with the HOLOGRAM technique), normal).

to answer this question, check the associated hypothesis, calculated arithmetic averages, standard deviations of performance study sample pre and post test application model completely, according to method education (imaging stereotaxic technique, normal), and as shown in table (4)

Table (4)

Arithmetic averages and standard deviations to test the comprehension of concepts in the pre and post measurements according to the teaching method (stereoscopic technique, the normal)

| pre performance | | post-performance | | teaching method |
|--------------------|-------|--------------------|-------|---------------------------|
| standard deviation | mean | standard deviation | mean | |
| 1.710 | 25.20 | 3.922 | 10.00 | technique hologram |
| 3.264 | 10.63 | 3.720 | 9.57 | Normal |

Table (4) shows that there is an apparent difference between the pre and post arithmetic average of the performance of the students of the experimental group that I studied with stereoscopic imaging technology, and the existence of apparent differences between the mean dimensional of the teaching method (stereotaxic technique, the normal) between the two study groups.

To find out whether these apparent differences were statistically significant, the accompanying one-way ANCOVA analysis of the dimensional measurement was used to per- test the application of the model according to the teaching method (stereoscopic technique, the normal) after neutralizing the effect of their measurement, and the following is a presentation of these results as Shown in Table (5)

Table (5) The

results of the accompanying One-way ANCOVA post-measurement analysis of the model application test. According to the teaching method (stereoscopic technique, the normal) after neutralizing the effect of pre-measurement they have.

| squar e Eat ² | level significance | value in | averagesu msquares | degrees freedo m | sum squares | source |
|--------------------------|--------------------|----------|--------------------|------------------|-------------|---------------|
| 100 | 015. | 6.300 | 39.191 | 1 | 39.191 | tribal |
| .898 | .000 | 503.456 | 3131.812 | 1 | 3131.812 | Group |
| | | | 6.221 | 57 | 354.576 | error |
| | | | | 59 | 3576.583 | total |

evident from table (5) the existence differences Statistical significance at the level of significance ($\alpha = 0.05$) on the test of applying the model according to the group (experimental, control) . The value of (P) was (503.456) with a statistical significance of (0.000), which is a statistically significant value, which means that there is an impact on the development of The basic skills in basketball are attributed to the teaching method with stereoscopic photography.

It is also evident from Table (5) that the size of the impact of implementing the model was large. The value of the Eta square (predicted²) explained (89.8%) of the explained () variance in the dependent variable, which is the development of basic skills in basketball among students of basketball education courses attributed to the method of teaching with stereoscopic photography.

In order to determine in favor of whom the differences were attributed, the arithmetic averages and their standard deviations were extracted according to the group, as shown in Table (6).

Table (6) The amended arithmetic averages and the standard error of the model application as a whole according to the teaching method (stereotaxic technique, standard) The

| standard error | arithmetic mean rate | method of education | test |
|-----------------------|-----------------------------|-------------------------------|-----------------------------------|
| 0.456 | 25.153 | technique Stereoscopic | (application of the model) |
| 0.456 | 10.680 | Normal | |

The results in Table (6) indicate The differences were in favor of the students who were exposed to the method of teaching by means of stereoscopic imaging technology compared to the control group.

This may be attributed to the fact that the use of stereoscopic imaging technology increased students 'suspense, attracted their attention to the lesson, and installed practical material in their minds, and worked to develop aspects of intelligence, and that presenting topics facilitated students' understanding process, and helped them understand basic practical skills that required attention, follow-up and prediction. This may also be attributed to the teaching of students through the educational unit designed with stereoscopic technique, which seeks to reach the stage of applying basic skills in an excellent manner that is more effective than facts in a piecemeal manner and helps them to form the overall picture, build impressions about the importance of topics, and link them to the realities of their lives by presenting Examples related to this reality showing a group of videos of some international players.

This result can be attributed to the fact that the use of hologram technology helps in creating three-dimensional illustrations of skills, by getting rid of the traditional situation in which students see images of skills, and the use of hologram technology in education enables students to perceive meanings by translating them. From one picture to another, explaining it, explaining it, and predicting through it certain results and effects based on the paths and trends contained in these ideas, clarity of ideas and their application in new situations, depicting the problem and solving it in different ways, and

this study is consistent with the results of Zaki's study (2017), as this study It indicated the effectiveness of education using hologram technology in conceptual comprehension, and this result is in agreement with the result of the study of (Salem and Farhood, 2018), which aimed to know the effect of the timing of providing guidance (before - during - after -) on hologram technology and its effect on the development of some social concepts and the survival of learning in children Kindergarten, which showed a statistically significant difference between the mean scores of the three groups in favor of the post application due to the primary effect of the difference in timing of

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providing direction (before, during, after) in the movie Hologram in developing understanding of social concepts.

This result differed with the result of study (Zaki's, 2017), which aimed to find out the impact of a proposed unit strategy in science education supported by hologram technology and its effect on conceptual comprehension, development of logical thinking and geological enlightenment among first-grade middle school students, which indicated that there was no statistically significant difference between the average degrees. The experimental group and the control group members in the post application of conceptual comprehension, logical reasoning test, and technological enlightenment scale.

Recommendations

in light of the study results The following is recommended:

- Encouraging faculty members to use the stereoscopic teaching method when developing students' basketball skills, and working on applying stereoscopic photography technology by everyone in order to help them increase accuracy in applying the model to students.
- Conducting studies to apply stereotaxic imaging technology to develop advanced skills in basketball on a different sample from the sample used in the study, and designing another educational unit for different courses.
- Make efforts to establish courses for faculty members to learn about the role of stereoscopic purification in increasing students' learning motivation, and its ability to motivate them towards learning.

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