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# EDGA-Based Directed Educational Units and Their Effect on Visual Memory and Some Basketball Skills Among Female Students

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ORIGINAL STUDY

# EDGA-Based Directed Educational Units and Their Effect on Visual Memory and Some Basketball Skills Among Female Students

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**Abstract**

**This study aimed to design teaching units based on the EDGA model and examine their effect on visual memory and selected basketball skills (high dribbling, low dribbling, chest pass, rebound, and ladder shooting) among first-level female students at the College of Physical Education and Sport Sciences, University of Baghdad. An experimental design with two equivalent groups and pre- and post-tests was used. The research population consisted of 26 first-year female students (2025–2026). Twenty-four students (92.31%) were selected as the research sample after excluding two students. The participants were randomly assigned into an experimental group (n = 12), which studied using EDGA-based teaching units, and a control group (n = 12), which followed the traditional method Visual memory and skill performance were assessed through pre- and post-tests, and data were analyzed using SPSS. The results showed significant improvements in both groups; however, the experimental group achieved greater progress in visual memory and basketball skills. Post-test results indicated clear development in high dribbling (2.66–7.13), low dribbling (2.53–7.43), and visual memory (50.88–67.5 The study concludes that teaching units structured according to the EDGA model positively enhance visual memory and facilitate the learning of basketball skills among female students. The study recommends adopting structured instructional models in physical education to improve cognitive and motor learning outcomes, and this achieves one of the sustainable development goals of the United Nations in Iraq which is (Quality Education).**

***Keywords:*** Learning modules, EDGA, Visual memory, Basketball

## 1. Introduction

Our current era is witnessing remarkable development in various fields of life, including teaching methods in physical education, which have achieved considerable success. These achievements are not the result of chance, but rather of sound scientific planning and the use of effective instructional methods based on the Edja model by many researchers and specialists in the field of physical education. It is well known that the subjects taught in the College of Physical Education and Sports Sciences are divided into two types: theoretical and practical, while some courses combine both types, such as basketball. First-year students are provided with theoretical and practical information that helps them recognize skills, learn how to perform them, identify common errors, and understand the important considerations related to these skills. Students are therefore required to possess an appropriate level of visual memory to employ it effectively in the practical application of these skills. The better the students' visual memory of this information, the greater their benefit in practical application.

There have been numerous, however, to develop various instructional model as alternatives of the Edja instruction for teaching and improving dissociative skills by applying contemporary methods and strategies which takes into consideration individual differences across learners. Each learner is given particular instruction components, and these individual

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differences have made it a must to treat each learner differently, which has given rise to individualized learning trends (Abdulghani et al., 2025; Hassan & Abdulkareem, 2025).

Basketball is known as a sport characterized by numerous motor and skill requirements that first-year female students need to practice extensively to overcome the obstacles they face during performance, whether related to the skill itself or to the learner. This can only be achieved through the availability of instructional tools that assist students in performing skills correctly. Hence, the importance of this research lies in designing instructional units based on the Edja model to enhance visual memory and facilitate learning of selected basketball skills, as they provide a solid basis for feedback. In the educational field, feedback is described as providing learners with rich and valuable information about the required task, in addition to helping students recognize their performance levels. This has a direct effect on enabling both the instructor and the student to reach the desired goal in the easiest way and in the shortest possible time. It also provides first-year students in the College of Physical Education and Sports Sciences for Women with various opportunities to acquire learning experiences based on the Edja model through practice, which in turn improves visual memory and learning of basketball skills (Abdullah, 2025; Amer Abdulhussain et al., 2025).

Through the researcher's follow-up of basketball as a teaching subject, it was observed that many students face difficulty in performing certain basketball skills and that insufficient attention is given by instructors to the role of visual memory. Moreover, the academic requirements in the college are numerous and varied, and basketball requires many conditions and demands, as well as skills characterized by a certain level of difficulty. Since first-year students study and learn these skills within their curriculum, the research problem emerged in the difficulty of performing these skills and the lack of attention to the role of visual memory in enhancing the learning process. This difficulty is experienced by students across different stages despite their years of study in the college.

The research aims to:

1. Design instructional units based on the Edja model for performing basketball skills (high dribbling, low dribbling, chest pass, bounce pass, and lay-up shooting) for first-year female students at the College of Physical Education and Sports Sciences for Women / University of Baghdad.
2. Identify the effect of instructional units based on the Edja model on visual memory among first-year female students at the College of Physical Education and Sports Sciences for Women / University of Baghdad.
3. Identify the effect of instructional units based on the Edja model on the performance of basketball skills (high dribbling, low dribbling, chest pass, bounce pass, and lay-up shooting) among first-year female students at the College of Physical Education and Sports Sciences for Women / University of Baghdad.

The researcher hypothesizes that: Instructional units based on the Edja model have a positive effect on visual memory and on the performance of basketball skills (high dribbling, low dribbling, chest pass, bounce pass, and lay-up shooting) among first-year female students at the College of Physical Education and Sports Sciences for Women / University of Baghdad.

The research domains included first-year female students at the College of Physical Education and Sports Sciences for Women, University of Baghdad, for the academic year 2025–2026. The study was conducted during the period from 10/10/2025 to / /2026, and it took place in the halls and playgrounds of the College of Physical Education and Sports Sciences for Women, University of Baghdad.

## 2. Methodology

### *2.1. Research method*

The nature of the research problem determines the appropriate method to reach suitable solutions in accordance with scientific research principles followed by the researcher and in harmony with the nature of the problem. Accordingly, the researcher adopted the experimental method using two equivalent groups with pre- and post-tests.

### *2.2. Population and sample of the research*

The research population consisted of first-year female students at the College of Physical Education and Sports Sciences for Women, University of Baghdad, for the academic year (2025–2026), totaling (26) students. A sample of (24) students was selected, as two students were excluded—one postponed her academic year and the other was absent during the experimental procedures. Thus, the sample represented (92.31%) of the original population and was considered a true representation. The sample was randomly divided into two groups: a control group of (12) students and an experimental group of (12) students.

### 2.3. Instruments, tools, and means used in the research

#### 2.3.1. Methods of data collection

1. Questionnaire (Appendix A) (Haerens et al., 2015)
2. Interview
3. Observation and experimentation
4. Testing and measurement

#### 2.3.2. Devices and tools used in the research

The researcher used the following devices and tools during the experiment:

1. Instructional units based on the Edja model
2. One video camera (SUNY)
3. Laser discs
4. Official basketball court
5. Stopwatch (SMART TIME)
6. Hand calculator (KENKO)
7. Twelve Chinese-made basketballs
8. Two markers (plastic cones, 30 cm height)
9. Four portable computers (laptops) (DELL)
10. Measuring tape
11. Vienna systemdy.

### 2.4. Field procedures

#### 2.4.1. Visual memory test

The D3 three-dimensional visual memory test includes instruction and testing and is done in a Vienna lab while subjects are under control. The test is three minutes long for each student and consists of three levels, namely easy (1-10), medium (11-20), and difficult (21-30). It consists of a training phase (where the learner is trained to perform the task) and a test phase (where his performance on the task is tested). Interpretations are based on percentile ranks: (0–24) low, (25–75) average, and (76–100) high. The measure is designed to assess visual memory and spatial perception in school children and is demonstrated to be both fundable and content valid.

#### 2.4.2. Selection of basketball skills

Basketball skills integrated into the first-year curricula in the College of Physical Education and Sports Sciences for Women are high dribble, low dribble, chest pass, bounce pass, and lay-up shooting.

#### 2.4.3. Determination of skill tests

Standardized scientific tests with established validity, reliability, and objectivity were adopted:

- Test 1: High-speed high dribbling start over a distance of (20 m) using the dominant arm (Zidan, 1997: 25).
- Test 2: Evaluation of technical performance (technique) of low dribbling skill (Zidan, 1997: 27).
- Test 3: Evaluation of chest pass performance using both hands (Al-Mandalawi et al., 1999: 68).
- Test 4: Evaluation of bounce pass performance using both hands (Abdulhafiz & Bahi, 2002).
- Test 5: Evaluation of lay-up shooting performance (Ismail, 2013: 78).

### 2.5. Pilot study

Five students were tested from the total sample by the researcher after each of the first and second introductory instructional units on Wednesday, September 12, 2007, at 8:30 am. The aims of the pilot study were to:

1. Determine the suitability of the tests for the research sample.
2. Provide an appropriate setting for students to watch the instructional video.
3. Ensure the suitability of the courts and balls.
4. Verify the efficiency of the electrical devices used.
5. Assess the adequacy of the assisting work team.

### 2.6. Scientific foundations of the tests

#### 2.6.1. First: Test validity

The validity of a test refers to the extent to which it accurately measures the specific construct it is designed to assess; for instance, valid tests focus on the intended construct rather than unrelated variables. The researcher ensured the validity of the tests by using content validity. This is a kind of validity that requires exploring the extent to which the test covers all the aspects or dimensions of that particular trait and whether it measures any single aspect of an entire phenomenon. Content validity is determined by the judgments of individuals knowledgeable about the specific content addressed in the examination.

#### 2.6.2. Second: Test reliability

Test–retest was employed to determine reliability. The questionnaires were re-administered in the pilot phase (15/12/2025); Spearman's correlation coefficient between test and re-test scores was calculated to determine reliability, a statistical tool accounting for the relationship between measurement results at two different points. High reliability of all the tests was observed as indicated by the correlation coefficient, whereby calculated values were higher than the tabled value at df (3) and $p < 0.05$, Table 4.

*Table 1. Reliability and objectivity coefficients of the tests proposed for application.*

| No. | Tests Proposed for Application | Reliability | t-value | Objectivity | t-value | Significance |
|---|---|---|---|---|---|---|
| 1 | High dribbling | 0.89 | 3.38 | 0.90 | 3.58 | Significant |
| 2 | Low dribbling | 0.90 | 3.58 | 0.88 | 3.21 | Significant |
| 3 | Chest pass | 0.88 | 3.21 | 0.91 | 3.81 | Significant |
| 4 | Bounce pass | 0.89 | 3.38 | 0.92 | 4.06 | Significant |
| 5 | Lay-up shooting | 0.90 | 3.58 | 0.89 | 3.38 | Significant |

The tabulated t-value is (3.18) at a degree of freedom (3) and a significance level of (0.05).

#### *2.6.3. Third: Test Objectivity*

The objectivity of the tests used was evaluated by calculating Spearman's correlation coefficient between the scores attributed by the first and second evaluators. Results The analysis showed a high level of objectivity as the computed values were more than 3.18, which is tabulated at degree freedom 3 with p value less than <0.05, as shown in Table 1.

### *2.7. Stages of designing instructional units according to the EDGA model*

The levels of the EDGA model were used systematically and integratively during all three lesson parts to benefit from visual learning to the full. In the introductory part, a decision was made with this section of a (20-minute) warm-up and explanation phase where the teacher introduced students by showing them short films and pictures with minimum technical elements: pass-type maneuver games, dribbling, and first-hand shooting games. This played to students' interest and made them eager to learn. Students were then put into small groups to construct mind maps together, where they documented their preconceptions and continued exchanging thoughts on the skills, making use of visual representation to aid in this process of sense-making.

in the main section (60 min) The explanation and application parts were held in the main. Clarification phase The technical and pedagogical aspects of each skill were explained in detail using visual aids such as videos, animations, and diagrams with a teacher who clearly distinguished between correct and incorrect performance. Students next adopted a practical approach as they practiced using their skills in real motor context-based exercises with classmates.

In the concluding section (10 minutes), students' performance was evaluated and feedback was provided. Cool-down, relaxation, and stretching exercises were also performed to restore the body to its normal state, achieving comprehensive integration between visual learning and motor practice.

### *2.8. Introductory units*

Two introductory units were applied before the pre-tests to acquaint the research sample with the skills of this study. These sessions were conducted by basketball coaches for novice students on 7–8/12/2025. The chest pass and bounce pass skills were described and demonstrated in Unit I, whilst the high dribbling, low dribbling, and lay-up shooting skills were presented in Unit II.

### *2.9. Pre-tests*

PRE-TESTS of high dribbling, low dribbling, and chest pass were conducted on the 16th and 17th of December, 2025, by the investigator in a sequence after taking consideration of time without practicing any intervened activities. The visual memory test was applied for both research groups by the Vienna system (College of Basic Education/Diyala University) on Wednesday, December 17.

### *2.10. Equivalence of the two sample groups*

The Mann-Whitney test was used to determine whether the experimental and control groups were equivalent with respect to visual memory and the other five abilities under study. The results are shown in (Table 2).

### *2.11. Main experiment*

The researcher conducted the main experiment starting on (22/12/2025), after completing the two introductory units, the pilot study, and the pre-tests for the academic year (2025–2026). The experiment was implemented according to the scheduled instructional units in the college timetable. The researcher carried out the following procedures:

1. Two instructional units per week were implemented.
2. The duration of the experiment was six weeks.
3. The total number of instructional units based on the EDGA model was (12).
4. The main experiment was conducted on the research sample according to the college schedule, with each instructional unit lasting (90) minutes.
5. The instructional units based on the EDGA model were conducted on Tuesdays and Wednesdays.

*Table 2. Equivalence of the two sample groups.*

| Variables | Unit | Pre-test Control (Median) | SD | Pre-test Experimental (Median) | SD | Mann–Whitney Value (Calculated) | Tabulated Value | Significance |
|---|---|---|---|---|---|---|---|---|
| High dribbling | Score | 2.66 | 0.25 | 2.66 | 0.29 | 65.5 | 42 | Not significant |
| Low dribbling | Score | 2.33 | 0.22 | 2.53 | 0.27 | 68 | 42 | Not significant |
| Chest pass | Score | 2.50 | 0.33 | 2.46 | 0.25 | 69.5 | 42 | Not significant |
| Bounce pass | Score | 2.49 | 0.24 | 2.49 | 0.24 | 59 | 42 | Not significant |
| Lay-up shooting | Score | 2.63 | 0.16 | 2.33 | 0.16 | 70 | 42 | Not significant |
| Visual memory | Score | 50.888 | 1.36 | 50.742 | 1.514 | 28.7 | 42 | Not significant |

6. The experimental group, consisting of (12) students, was divided into four subgroups, and a computer was allocated to each group.
7. The researcher conducted a visual memory test for each skill after it had been learned, as follows:
   - High dribbling: An achievement test was given in the second week after the technique had been explained demonstrating through applications of instructional units.
   - Low dribbling: One week after the instruction of this skill, an achievement test was applied.
   - Chest pass: An achievement test was administered in the week after instruction of the skill
   - Bounce pass: A skill test was organized in the week after the training of the respective skill
   - Lay-up shooting: an achievement test was conducted in the week following its learning.

### *2.12. Post-tests*

The post-tests (26-27 January 2026) the researcher conducted on the College of Physical Education and Sports Sciences University of Baghdad outdoor basketball court for both experimental and control groups. The skills of the students were recorded with a video camera and copied onto a compact disc (CD). The procedure of the post-tests was the same as that for the pre-tests, and almost identical spatial and temporal conditions were maintained.

### *2.13. Statistical methods*

The researcher used the following statistical methods, processed through SPSS statistical software, to obtain the results of the study.

## 3. Results and discussion

The following statistical test (non-parametric), Wilcoxon, as indicated in Table 3, has been applied on the data collected through pre- and post-tests to support the research hypothesis, achieve its objectives, and determine the impact of instruction units based on the EDGA model.

According to the data collected from the pre- and post-tests, the researcher used a non-parametric statistical test (Wilcoxon) to test research hypotheses, reach the goals of the study, and examine the effect of educational packages on the basis of the EDGA model. The results are presented in Table 4.

Tables 4 and 5 showed statistically significant differences in favor of all post-tests of the investigated skills and visual memory for both the control and experimental groups.

The researcher attributes the growth experienced by the experimental group to instruction using units based on the EDGA model. This enhancement can be explained by the inclusion of different educational features in those units, as a series of images presenting the skill from its initial phase to endpoint. Some concepts and ideas can be best conveyed visually with illustrations or pictures, as it's more manageable in writing or speaking. The author also highlights the relevance of the phases of the EDGA model (stimulate, dialogue, clarify, and apply), which make use of their prior knowledge to create new knowledge in a meaningful way. This promotes deep comprehension and engages students in interacting with varied experiences. It is used in the development of understanding and higher-order thinking by the practice of mental processes and manipulation through purposeful talk. It allows students to use information in new circumstances and makes it easier for difficult and abstract concepts that are hard to teach in the traditional way to be learned, thus leading to students' successful learning and development (Mahdi, 2023; Forte et al., 2025).

All these stages of the EDGA model contributed to clarifying the performance process, which helped learners achieve better understanding and perception of the skill as a whole and in its detailed components. The more information learners receive and the more diverse its sources, the more effective learning becomes, facilitating the processes of reception, storage, and retrieval. These instructional means accelerate the acquisition of motor skills, which is consistent with the findings of Hamid (2023).

*Table 3. Median values, quartile deviations, wilcoxon values, and statistical significance of the visual memory test and the investigated skills for the experimental group.*

| Variables | Pre-test Median | QD | Post-test Median | QD | Wilcoxon Value (Calculated) | Tabulated Value | Statistical Significance |
|---|---|---|---|---|---|---|---|
| High dribbling | 2.66 | 0.29 | 7.13 | 0.16 | 0 | 13 | Significant |
| Low dribbling | 2.53 | 0.27 | 7.43 | 0.33 | 0 | 13 | Significant |
| Chest pass | 2.46 | 0.25 | 7.15 | 0.34 | 0 | 13 | Significant |
| Bounce pass | 2.49 | 0.24 | 7.49 | 0.25 | 0 | 13 | Significant |
| Lay-up shooting | 2.33 | 0.16 | 7.33 | 0.27 | 0 | 13 | Significant |
| Visual memory | 50.888 | 1.536 | 67.555 | 1.130 | 0 | 13 | Significant |

Sample size = (12) and significance level = (0.05).

*Table 4. Median values, quartile deviations, wilcoxon values, and statistical significance of the visual memory test and the investigated skills for the control group.*

| Variables | Pre-test Median | QD | Post-test Median | QD | Wilcoxon Value (Calculated) | Tabulated Value | Statistical Significance |
|---|---|---|---|---|---|---|---|
| High dribbling | 2.66 | 0.25 | 3.33 | 0.33 | 0 | 13 | Significant |
| Low dribbling | 2.33 | 0.22 | 3.35 | 0.28 | 0 | 13 | Significant |
| Chest pass | 2.50 | 0.33 | 3.49 | 0.43 | 0 | 13 | Significant |
| Bounce pass | 2.49 | 0.24 | 3.37 | 0.29 | 0 | 13 | Significant |
| Lay-up shooting | 2.63 | 0.16 | 3.66 | 0.41 | 0 | 13 | Significant |
| Visual memory | 50.742 | 1.514 | 61.574 | 2.743 | 0 | 13 | Significant |

Sample size = (12) and significance level = (0.05).

In addition, the instructional units provided various forms of feedback at different stages of skill learning, which stimulated and activated memory. This included immediate feedback through instructional videos, sequential images during performance, and verbal feedback from the instructor during the instructional unit based on the EDGA model. Lockhart indicated that visual and verbal information are very important in the early stages of learning (Ruzouqi et al., 2017; Hernando-Garijo et al., 2021).

The researcher also says that the statistical differences in favor of the experimental group are because the main part of the instructional units included fun exercises that made students want to compete with each other and helped them improve their basic skills. Using motivating exercises is a key part of helping students improve their technical, physical, and mental skills. Also, organizing and coordinating neuromuscular activity through skill-based exercises is an important part of learning because motor performance needs to be controlled and sequenced, which in turn helps improve visual memory. Visual memory involves perceiving actual images of external stimuli as they exist in reality and subsequently retaining them in an abstract form referred to as a symbol, which rapidly dissipates if not actively engaged with. Iconic memory is primarily visual and relies on vision for its durability (Hintzman, 1988; Lucia et al., 2022). It does not hold information for over two seconds and may be erased by subsequent visual stimuli; there is ongoing debate regarding whether the icon is central or peripheral, with "central" denoting its position in the brain (Jaafar, 1991; Jouda, 2024).

The eye plays an important role in gathering information from the environment and telling the difference between still and moving images. Visual function is the ability to take in visual information, understand it, see it, and turn it into movement. The main job of the eye is to see things and figure out how clear they are. This is how other visual functions start. The cerebral cortex connects to the retina through the optic nerve and processes incoming stimuli from the retina

*Table 5. Median values of the experimental and control groups, and Mann–Whitney calculated and tabulated values for the post-tests of visual memory and the investigated skills.*

| Variables | Experimental Group (Median) | Control Group (Median) | Mann–Whitney Value (Calculated) | Tabulated Value | Statistical Significance |
|---|---|---|---|---|---|
| High dribbling | 7.13 | 3.33 | 0 | 42 | Significant |
| Low dribbling | 7.43 | 3.35 | 0 | 42 | Significant |
| Chest pass | 7.15 | 3.49 | 0 | 42 | Significant |
| Bounce pass | 7.49 | 3.37 | 0 | 42 | Significant |
| Lay-up shooting | 7.33 | 3.66 | 0 | 42 | Significant |
| Visual memory | 67.30 | 61.57 | 0 | 42 | Significant |

Sample size = (24) and significance level = (0.05).

in the central nervous system to create visual perception. This is a complicated process that includes both sight and vision. Vision is an integrated unit of eye functions; the process of seeing cannot be completed without vision, and vision cannot occur without sight. This is called the functional integration between the eye and the brain (Abdulhussein et al., 2026).

Table 5 shows that the post-tests significantly differed between the groups. The differences are attributed by the researcher to the occurrence that units of instruction were designed based on the EDGA model as an inclusive set of instructional options through which the skills' understandability was encouraged and supported. This had a positive impact on comprehension and perception of the abilities' characteristics, elements, and components that were not equally available for control participants.

The EDGA model encourages students to search and investigate, developing their ability to acquire knowledge from multiple sources and evaluate it critically. It also contributes to learning dialogue and social interaction skills, as students engage in constructive discussions with their peers, helping them defend their viewpoints, persuade others, and appreciate and accept different opinions. The model reinforces educational objectives clearly in students' minds, enhances their motivation for learning, contributes to academic success, and prepares a generation capable of facing future challenges (Younis, 2022; Sha & Chiu, 2025).

The superiority of the E group is also explained by the strengthening of the teacher in a model like the EDGA. Teachers then attempt to connect new learning with students' previous knowledge and experiences, since future learning is predicated upon an earlier foundation of information and skills. The classroom scene is converted into an attractive learning challenge through the skill exercises, images, and video clips that encourage learner involvement. In the discussion step, teachers let students dig deeper by proposing questions and expectations, which are written down as a concept map to go in line with the otherwise constructivist belief system of dialogue and interaction in an interactive classroom (Ali, 2023; Weissman, 2019).

The researcher also attributes the contribution of the model to promoting cooperation among students through dividing them into balanced groups that discuss different viewpoints, enabling continuous and constructive dialogue. After the discussions, the teacher provides feedback, corrects misconceptions with justification, organizes correct information, and explains the lesson. Students are then asked to present a final project that reflects what they have learned and to address similar problems by proposing solutions, accompanied by individual assessment and immediate feedback, which helps consolidate information effectively (Nayef, 2020).

Classroom management is the rules and routines that teachers utilize to structure the environment so that students will be more responsive to learning activities. A well-structured education environment enhances students' learning experience, helps them be more involved, and allows them to complete classroom assignments with greater ease. According to Abdullah (2025), engaging students in discussions and classroom conversation also enhances their academic performance.

The EDGA model is an effective way to develop visual memory and the learning of basic skills in basketball among girl students. The skill is taught in steps (stimulation, dialogue, clarification, and application) and through the visual aids of video clips, images, and diagrams so that students can literally 'see' the skill being learned. Institutions allow them to use visual stimulation in their work, helping them activate the learned information better and easier, as well as turning the theoretical knowledge into real motor activity. Further, the model promotes positive and healthy interaction, attitudes of self-worth, motivation to achieve goals, and the facilitation of a student's ability to use skills effectively in the competitive environment.

## 4. Conclusions

Based on the research results, the researcher reached the following conclusions:

1. The training units designed based on the model of individual lessons classes teaching (EDGA model) proposed, compared to existing traditional methods of teaching a positive effect in terms of visual memory and selected basketball skills. This was reflected in the experimental group, where the visual memory score increased from 50.888 on pre-test to 67.555 on post test and the performance score of high dribbling increased from 2.66 to 7.13 which showed how much growth occurred between both learning cognitive and motor skills
2. The better visual memory was developed, as the use of video-based demos, sequential images and guided practice had improved students' entire perception towards learning of basketball skills within same EDGA-supported instruction units.
3. These findings indicate that the combination of structured instructional models and visual learning tools can play a positive role in supporting

the learning of basketball skill acquisition among female students in similar educational contexts-however these results should be considered with reservation given the relatively small sized sample utilized within this study.

## 5. Recommendations

In light of the results reached by the researcher, the following recommendations are proposed:

1. Based on the findings of this study, it is suggested to include instructional units based on EDGA model in teaching basic basketball skills in Colleges of Physical Education and Sports Sciences since they can foster improvement in students' visual memory as well as their skill performance.
2. During skill instruction, physical education instructors are encouraged to use visual learning tools (video demonstrations, series of images or photos, and guided feedback) because these strategies may assist students with cognitive processing and motor skill learning.
3. The present research will need to be replicated with larger samples and multiple teaching environments in future studies to confirm the effectiveness of the EDGA model and increase external validity of the findings.
4. Future research can investigate if the EDGA model is useful in teaching (physical) skills in other sports or different sport activities, for example, volleyball, soccer and gymnastics.
5. This study is recommended that subsequent researches explore the impact of the EDGA framework on different pedagogical and psychological dimensions within the context of motor learning efficiency,
6. motivation towards learning, attention or decision making regarding sports performance.

## Conflict of interest

None.

We confirm that all tables and figures in this article are ours and written by the researchers themselves.

## Ethical clearance

This manuscript approved by Baghdad University on (1/10/2025).

## Author's contributions

All contributions of this study were done by the researchers (Hanaa Abbas Abdullah ) who get the main idea and work on writing and concluding also with number of experts, Zahra Shihab in Statistics, Amad Sarmed in revision, Abdullha Waleed Abdulkareem in translating.

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## Data availability

The authors confirm that the data supporting the findings of this study are available within the article [and/or] its supplementary materials.

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# Appendix A

**Questionnaire: Evaluation of EDGA-Based instructional units.**

| No. | Item | Strongly Agree (5) | Agree (4) | Neutral (3) | Disagree (2) | Strongly Disagree (1) |
|---|---|---|---|---|---|---|
| 1 | The visual materials (videos and images) helped me understand the skill clearly. | | | | | |
| 2 | The stimulation phase increased my motivation to learn. | | | | | |
| 3 | The dialogue stage helped me exchange ideas and correct mistakes. | | | | | |
| 4 | The clarification stage made the technical points of the skill easier to understand. | | | | | |
| 5 | The application stage improved my practical performance. | | | | | |
| 6 | The instructional unit considered individual differences among students. | | | | | |
| 7 | The feedback provided during the lesson improved my performance. | | | | | |
| 8 | The use of visual presentation enhanced my visual memory. | | | | | |
| 9 | The learning environment encouraged cooperation and discussion. | | | | | |
| 10 | I prefer learning basketball skills using the EDGA model compared to the traditional method. | | | | | |

# الوحدات التعليمية الموجهة القائمة على نموذج EDGA وأثرها في تنمية الذاكرة البصرية و بعض مهارات كرة السلة لدى الطالبات

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**المستخلص**

هدفت هذه الدراسة إلى تصميم وحدات تعليمية قائمة على نموذج EDGA والكشف عن تأثيرها في الذاكرة البصرية وبعض مهارات كرة السلة المختارة (الطبطبة العالية، الطبطبة الواطئة، المناولة الصدرية، المتابعة، والتصويب السلمي) لدى طالبات المرحلة الأولى في كلية التربية البدنية وعلوم الرياضة / جامعة بغداد , استُخدم المنهج التجريبي بتصميم المجموعتين المتكافئتين مع اختبارات قبلية وبعدية. تكوّن مجتمع البحث من (26) طالبة للعام الدراسي (2025–2026)، وتم اختيار (24) طالبة بنسبة (92.31%) عينةً للبحث بعد استبعاد طالبتين. وجرى توزيعهن عشوائياً إلى مجموعتين: تجريبية (12) طالبة درست وفق وحدات تعليمية مبنية على نموذج EDGA، وضابطة (12) طالبة درست وفق الأسلوب التقليدي. تم قياس الذاكرة البصرية والأداء المهاري من خلال الاختبارات القبلية والبعدية، ومعالجة البيانات إحصائياً باستخدام برنامج (SPSS).

أظهرت النتائج وجود تحسن معنوي في المجموعتين، إلا أن المجموعة التجريبية حققت تطوراً أكبر في الذاكرة البصرية ومهارات كرة السلة. كما بينت نتائج الاختبارات البعدية تطوراً واضحاً في الطبطبة العالية (2.66–7.13)، والطبطبة الواطئة (2.53–7.43)، والذاكرة البصرية (50.88–67.55).

واستنتجت الدراسة أن الوحدات التعليمية المبنية وفق نموذج EDGA تسهم إيجابياً في تنمية الذاكرة البصرية وتسهيل تعلم مهارات كرة السلة لدى الطالبات، وأوصت باعتماد النماذج التدريسية المنظمة في دروس التربية البدنية لتحسين نواتج التعلم المعرفية والحركية, وهذا يحقق أحد أهداف التنمية المستدامة للأمم المتحدة في العراق وهو (التعليم الجيد).

**الكلمات المفتاحية:** وحدات تعليمية ، ايدجا ، الذاكرة البصرية ، كرة السلة .