



## THE EFFECT OF THE COOPERATIVE INTEGRATION METHOD OF FRAGMENTED INFORMATION USING THE JUMPING DEFENSIVE WALL DEVICE (JWD) IN TEACHING THE FRONT SHOT AND THE LAY-UP SHOT IN BASKETBALL FOR STUDENTS

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### Abstract

Progress in the teaching process requires instructors to select the best methods to improve shooting skills, which are of great importance in basketball. However, the significance of this study lies in the absence of a similar device.

### Research Problem:

Does learning through the cooperative integration method of fragmented information using the JWD device contribute to teaching the front shot and the lay-up shot?

### Research Objective:

To investigate the effect of the cooperative integration method of fragmented information using the Jumping Defensive Wall Device (JWD) in teaching the front shot and the lay-up shot.

### Keywords:

(Jumping Defensive Wall Device, Cooperative Integration Method of Fragmented Information, Types of Shooting)

### 1.1 Introduction and Importance of the Research

Accuracy is a fundamental aspect in executing both the front shot and the lay-up shot in basketball. Maximizing its effectiveness in matches necessitates more effort from researchers to teach students how to perform these shots with distinction. The cooperative integration method of fragmented information, along with innovative modern devices, aligns with advancements in defensive basketball techniques, particularly in enhancing shooting accuracy against tall defensive players.

Teaching students improved shooting techniques significantly increases their chances of winning, as it directly contributes to scoring points during matches. Hence, the research emphasizes the application of the cooperative integration method of fragmented information using the Jumping Defensive Wall Device (JWD) in teaching the front shot and the lay-up shot in basketball. This method and the invented device serve as effective tools for instructors to enhance students' shooting abilities more efficiently.

### 1.2 Research Problem

There is no doubt that improving students' shooting accuracy through an innovative approach, utilizing the Jumping Defensive Wall Device in basketball, requires instructors to develop teaching methods based on innovative devices and scientific inventions. These methods should introduce variations and modifications that facilitate learning.

A critical question arises:



- Does teaching the front shot and the lay-up shot in basketball through the cooperative integration method of fragmented information using the invented device result in uniform skill acquisition among students, or does it vary based on performance type, capability, and skill level?

The researcher sought to explore this issue and find an objective solution that suits this field. The study applies the cooperative integration method of fragmented information using the Jumping Defensive Wall Device (JWD) in basketball to develop the front shot and the lay-up shot among students.

### 1.3 Research Objectives

1. To examine the effect of the cooperative integration method of fragmented information in developing the front shot and the lay-up shot in basketball for students.
2. To determine the impact of using the Jumping Defensive Wall Device (JWD) alongside the cooperative integration method of fragmented information in improving students' front shot and lay-up shot performance in basketball.

### 1.4 Research Fields

#### 1.4.1 Human Field:

First-year students at the College of Physical Education and Sports Sciences, University of Al-Qadisiyah.

#### 1.4.2 Spatial Field:

Basketball court, University of Al-Qadisiyah / College of Physical Education and Sports Sciences.

#### 1.4.3 Temporal Field:

From Sunday, March 3, 2024, to Sunday, May 26, 2024.

### 1.5 Definition of Terms

#### 1.5.1 Jumping Defensive Wall Device (JWD) in Basketball:

A sports device designed in the form of a human-like defensive wall, consisting of mannequins with electronic, electrical, and mechanical jumping movements. It moves from bottom to top, making basketball shooting more challenging. The device features programmed maps, an electronic processor, and motion-detecting sensors.

## Chapter Two: Research Methodology and Field Procedures

### 2.1 Research Methodology

The researcher adopted the **experimental method** using the design of **two equivalent groups** due to its suitability for the nature of the research problem.

### 2.2 Research Population and Sample

The nature of the problem necessitated defining the research population and selecting the appropriate sample to address it. The population was chosen based on the fact that **shooting skills are taught in the first year**, making **first-year students at the College of Physical Education and Sports Sciences, University of Al-Qadisiyah, for the academic year 2024-2025** the designated research population. The total number of students was **90 male students**.

A **simple random sampling method** was used to select **24 students**, representing **21.6%** of the total population. The sample was then **divided equally into two experimental groups using simple random selection**:

- **The first experimental group** was trained using **only the cooperative integration method of fragmented information**.
- **The second experimental group** was trained using **the cooperative integration method of fragmented information along with the Jumping Defensive Wall Device (JWD)**.

Groups	Steps
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First Group (12 students)	Pre-test → Cooperative Integration Method of Fragmented Information → Post-test → Difference between pre- and post-test → Difference between groups in post-tests
Second Group (12 students)	Pre-test → Cooperative Integration Method of Fragmented Information + JWD Device → Post-test

## 2.3 Research Tools and Equipment Used

### 2.3.1 Data Collection Methods

- Arabic sources and references
- Internet resources
- Observations and open-ended personal interviews with experts
- Special forms for collecting test results

### 2.3.2 Instruments and Devices Used in the Study

- **A standard basketball court**
- **28 official basketballs**
- **Laptop (HP brand)**
- **The Jumping Defensive Wall Device (JWD) designed for the study**
- **Whistle**
- **Three Japanese-made electronic stopwatches**
- **Chinese-made medical scale for weight measurement**

### 2.3.3 Jumping Defensive Wall Device (JWD) in Basketball [1]

The **JWD** is an **athletic device** designed in the shape of a **human-like player** consisting of:

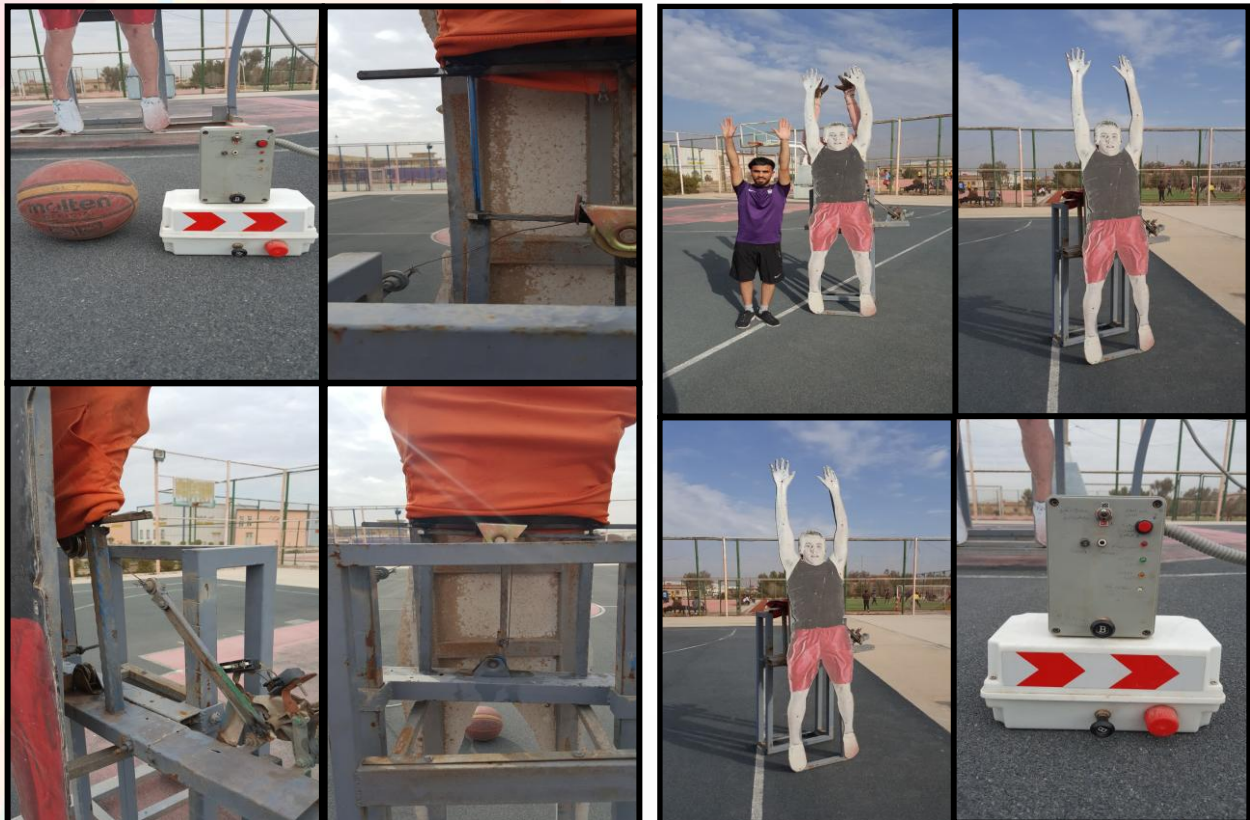
- A **static defensive mannequin** that acts as a **passive wall**.
- A **separate movable back wall** that allows for **vertical jumping motion** to **simulate defensive blocking**.
- A **mechanized upper-body movement** (from the **hip to the head and arms**) with **electric and mechanical jumping motion**.
- A **manual adjustment feature** for the **static front wall** with **variable height settings**.

### Device Purpose and Benefits

- Designed to **teach and train** basketball players and students on **shooting techniques**.
- Suitable for **all height categories** and **different skill levels**, including **juniors, cadets, youth, and professional players**.
- Assesses and determines the appropriate **ball height over the defensive wall**.
- Enhances **engagement and excitement** in training by simulating **real defensive challenges**.
- Structurally robust and **resistant to tipping over**, making it **highly durable and portable** (equipped with **metal arms and wheels** for easy transport).
- Can be utilized by **basketball teams, schools, sports clubs, youth centers, and physical education academies**.



**Figure (1):** Illustration of the JWD device.  
**Figure (2):** Illustration of JWD movements during execution.



## 2.4 Research Procedures

The researcher selected a set of tests to assess basketball shooting skills. Specifically, two shooting tests were chosen, based on the work of **Dr. Intisar Owaid**, [2] to evaluate student performance:

1. **Front Shot Test**
2. **Lay-up Shot Test**

Below is a detailed explanation of the selected tests included in the test battery.

### 2.5.1 Front Shot Test

#### *Objective of the Test*

To measure the player's shooting skill in executing the **front shot** accurately toward the target.

#### *Equipment and Tools Used*

- **Basketball court**
- **Basketball**

#### *Test Execution Method*

- The participant shoots the ball at the basket **from outside the free-throw area**, specifically **from the intersection of the free-throw line extension with the key's semicircle**.
- A **marker** is placed in the designated shooting spot to ensure consistency.

## Performance Conditions

1. The participant may **shoot using one hand or both hands**, employing **any shooting technique**.
2. The shot must be **directed toward the target** without touching the **backboard**.
3. Each participant gets **15 attempts**, divided into **three sets of five shots each**.
4. Shots must be **taken from the designated spot** without stepping out of the marked area.

## Scoring Criteria

- **1 point** is awarded for a shot that **hits the rim** but does not enter the basket.
- **2 points** are awarded for a **successful shot** that enters the basket.
- **No points** are given if the ball **touches the backboard** before reaching the basket.

## Note:

This test is **applicable to both male and female participants**.

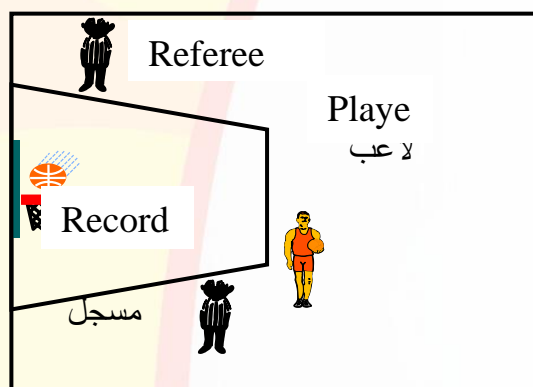


Figure (1)

## 2.5.2 Lay-up Shot Test

### Objective of the Test

The purpose of this test is to **assess the player's skill in executing the lay-up shot**.

### Equipment and Tools Used

- **Basketball hoop**
- **Basketball**

### Test Execution Method

- Each participant is given **three attempts** from a **predetermined distance (Figure 2)**.
- The participant must **perform the lay-up shot** by first **bouncing the ball high from a stationary position** and then taking **two steps either to the right or left** toward the backboard before attempting the shot.

### Performance Conditions

- Participants are allowed to **practice a few shots** before the official test begins.
- Each participant is given **three official shot attempts** during the test.

### Scoring Criteria

- Each attempt is worth **30 points**.
- The highest score achieved among the **three attempts** is recorded as the participant's final score.

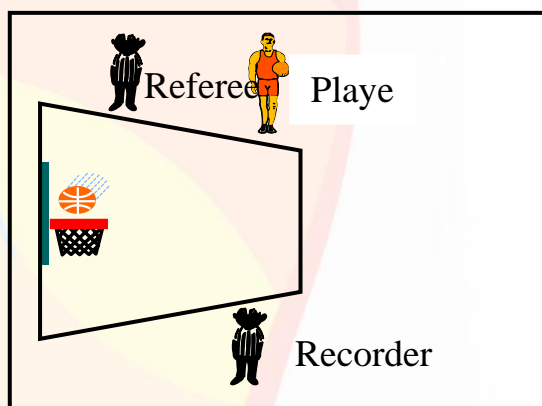


Figure (2)

## 2.6 Exploratory Experiment

Before initiating the main research procedures, the researcher conducted an **exploratory experiment** on **March 25, 2024, at 10:00 AM** using a sample of **four players** who were **not part of the main research population**. The objectives of this experiment were:

1. Identifying **potential obstacles** that could arise during the study.
2. Ensuring the **functionality and effectiveness of the JWD device** before full-scale implementation.

## 2.7 Field Research Procedures

The **field research process** involved:

- **Pre-test** assessments.
- Implementation of the **cooperative integration method of fragmented information** for the **first experimental group**.
- Implementation of the **cooperative integration method of fragmented information along with the JWD device** for the **second experimental group**.
- **Post-test** assessments to measure the impact of the intervention.

### 2.7.1 Main Experiment

The **main experiment** was conducted between **April 1, 2024, and May 26, 2024**. It involved applying the **cooperative integration method of fragmented information** along with the **innovative JWD device** to assess its effect on improving basketball shooting skills.

#### 2.8.1 Pre-test

The **pre-test measurements** were conducted on **April 2, 2024, at 10:00 AM** at the **basketball court of the College of Physical Education and Sports Sciences**.

To ensure **consistent and reliable results**, the researcher:

- **Standardized the testing environment**, ensuring the same **location, time, equipment, and execution method**.
- **Maintained the same research team** to assist in conducting both **pre-test and post-test** assessments.
- **Controlled external variables** to create conditions as similar as possible to those expected in the post-test.

#### 2.8.2 Educational Program





## 2.8.2.1 First Experimental Group (Cooperative Integration Method of Fragmented Information)

It is important to note that **both experimental groups** followed the **same preparatory phase, educational activities, and conclusion of the lesson**. The primary difference between the groups lay in the **execution method of the practical activities** during the main phase of the lesson.

The **cooperative integration method** for teaching basketball shooting skills was applied as follows:

1. **Both experimental groups** were taught using the **cooperative integration method of fragmented information** to develop **front shot and lay-up shot** execution.
  - Students were **divided into four small groups**, each containing **five students** with **varying levels of shooting skills**.
2. The **instructor** explained the **shooting skills** in a **step-by-step, sequential manner, breaking down** the execution process into **smaller components**.
  - Skills were **clearly demonstrated and explained** to help students understand the **correct execution techniques**.
  - Each student was assigned a **specific phase** of the skill and was responsible for mastering that part.
3. If any **difficulties** or **questions** arose, students were allowed to consult the **instructor for guidance and clarification**.
4. The instructor **monitored** and **supervised** the group **throughout the execution phase** to maintain **discipline and order**.
5. At the end of the **lesson unit**, the instructor conducted **evaluation tests** to assess students' progress.
  - These evaluations **helped students identify their strengths and weaknesses**.
  - They provided **additional learning experiences** related to the **concepts and principles of the skills being taught**.
  - The instructor discussed **performance results** with students to **enhance learning outcomes**. [3]
6. **Group Performance Influence:**
  - The instructor emphasized that **each student's performance directly affected the overall group score**.
  - If an **individual student performed well**, the **group's total score increased**, and vice versa.

## 2.8.2.2 Second Experimental Group (Cooperative Integration Method + JWD Device)

- The **second experimental group** followed the **same cooperative integration method**, but with the addition of the **Jumping Defensive Wall Device (JWD)**. [4]
- The **JWD device** was integrated into the training to **simulate real-game defensive pressure**, providing an additional **challenge for the learners**.

### The Researcher's Role:

- The researcher was responsible for:
  - **Setting up the JWD device** before each training session.
  - **Supervising and guiding students** in learning with the device.
  - **Removing the device** after the **completion of each lesson**.
  - **Monitoring the overall experiment**, including:
    - **Time management**
    - **Repetition count**
    - **Ensuring consistency in all educational units**



This structured approach ensured **systematic skill development** while enhancing the **students' ability to adapt to real-game defensive challenges**.

Research Group Work Methodology

In the educational approach, the researcher applied the **cooperative integration method of fragmented information** and compared it with the **second experimental group, which used the JWD device**.

- Each **experimental group was divided into four subgroups**, with each subgroup consisting of **four students performing the shooting skills**.
- The second experimental group was also divided into **four subgroups, with four students in each, using the JWD device**.

After completing the **educational program**, students were evaluated through **post-training tests**. Observations from the assessment forms indicated:

1. **High level of collaboration** among students in **problem-solving** as instructed by the teacher.
2. **Strong idea-sharing** within groups, allowing for **effective learning**.
3. **Rotational leadership**, where **each group member** took turns as the leader, fostering **leadership skills** and enabling students to **guide their teams effectively**.
4. Enhanced **team coordination** and **task organization**, leading to **efficient task completion**.
5. **Structured and disciplined approach**, where students adhered to the **required learning tools and maintained order**, improving the **overall effectiveness of the cooperative learning method**.

### 2.8.3 Post-test

The **post-test** was conducted on **Thursday, May 2, 2024**, following the completion of the **four-week training program** that applied the **cooperative integration method of fragmented information** and the **JWD device**.

- The researcher ensured that **testing conditions were identical to the pre-test, with assistance from the research team**.

### 2.9 Statistical Methods Used in the Study

After collecting data, the researcher performed **statistical analyses** using **SPSS software** to derive meaningful insights from the results.

## Chapter Three: Presentation, Analysis, and Discussion of Results

This chapter presents, analyzes, and discusses the study results. The collected data from the **pre-test and post-test assessments** were **organized into tables** to facilitate **scientific interpretation** and enable the verification of the study's **hypotheses and objectives**.

### 3.1 Presentation, Analysis, and Discussion of Results

This section provides a detailed comparison of the **pre-test and post-test results** for the two experimental groups regarding their **front shot and lay-up shot performance in basketball**.

*Table 1: Pre-test and Post-test Results of the Two Experimental Groups*

Group	Skill	Measurement Unit	Pre-test Mean ( $\pm$ SD)	Post-test Mean ( $\pm$ SD)	T-Value	Significance Level
Experimental Group 1	Front Shot	Score	8.417 $\pm$ 0.515	11.417 $\pm$ 0.515	0.000	Significant
Experimental Group 2	Front Shot	Score	8.667 $\pm$ 0.651	13.583 $\pm$ 0.669	0.000	Significant
Experimental Group 1	Lay-up Shot	Score	15.167 $\pm$ 0.718	18.250 $\pm$ 0.452	0.000	Significant

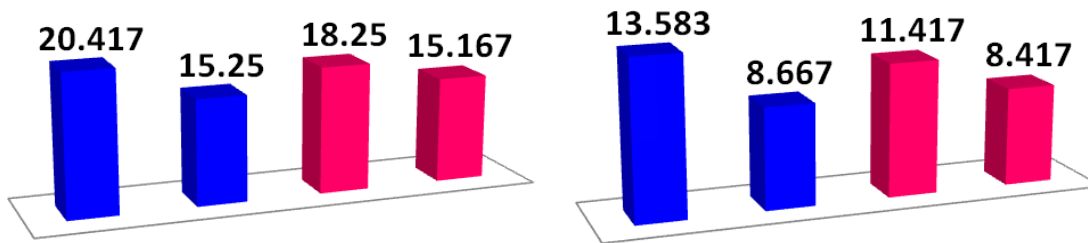




Experimental Group 2	Lay-up Shot	Score	15.250 ± 0.754	20.417 ± 0.515	0.000	Significant
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### Analysis and Discussion of Results

1. Both **experimental groups** showed **significant improvements** in their **front shot and lay-up shot performance** after training.
2. The **second experimental group**, which trained using the **JWD device**, achieved **higher performance gains** than the first group.
3. The **JWD device played a crucial role** in enhancing shooting accuracy by **simulating defensive pressure**, helping students adapt to **real-game conditions**.
4. The findings **confirm the effectiveness** of using **innovative training tools** alongside **cooperative learning strategies** to **develop basketball shooting skills**.



### 3.2 Discussion of Pre-test and Post-test Results for Both Experimental Groups

Upon reviewing the outcomes supplied in Table 1, it is obvious that the publish-check consequences for each experimental corporations showed considerable development as compared to the pre-test consequences. This suggests an ordinary enhancement in studying and performance within the the front shot and lay-up shot abilities.

The cooperative integration method of fragmented records become instrumental in enhancing performance, because it allowed for the step-by using-step breakdown of each phase of skill execution. The researcher attributes this improvement to the innovative gaining knowledge of method, in which each level of execution is mastered in my view before being integrated into the full ability, main to greater retention and refinement. The structured breakdown of competencies accelerated the beginners' sense of obligation, making sure that every group member contributed successfully to attaining the institution's collective purpose. This instructional method transformed getting to know right into a collaborative procedure, allowing college students to actively interact, talk, and beef up their know-how through peer interplay.

Moreover, the collaborative method promoted a sense of shared responsibility, making sure that every student contributed to the institution's typical achievement. This reinforced organization duty and recommended novices to aid and assist one another, leading to better overall performance.

The researcher additionally believes that the effectiveness of the cooperative approach lies in its capability to shape mastering sequentially, beginning with simple cognitive popularity and information, followed by means of repeated exercise, and culminating in skill mastery. This step-by way of-step approach ensures that newbies gradually build self assurance and skillability in their capturing strategies.

The 2nd experimental institution, which incorporated the JWD device into education, verified superior overall performance compared to the first group. The JWD device delivered extra defensive demanding situations, enhancing gamers' adaptability, accuracy, and decision-making below simulated in-sport conditions.



Furthermore, the researcher indicates that the organization-primarily based department of tasks in the cooperative integration approach contributed to higher consciousness and execution. Since each student specialized in a particular component of the talent, they had been capable of communicate their expertise effectively with out distractions from more than one gaining knowledge of objectives. This superior their comprehension and technical execution, at the same time as concurrently growing teamwork and communicate capabilities.

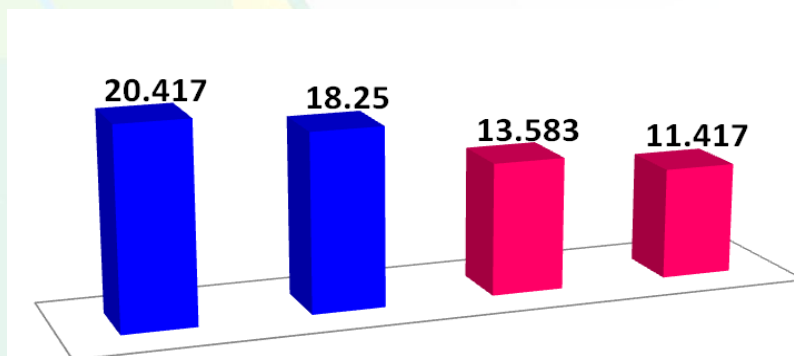
### 3.3 Presentation, Analysis, and Discussion of Post-test Results for Both Experimental Groups

*Table 2: Comparison of Post-test Results Between Experimental Groups*

Skill	Measurement Unit	Experimental Group 1 (Mean $\pm$ SD)	Experimental Group 2 (Mean $\pm$ SD)	T-Value	Significance Level	Result
Front Shot	Score	11.417 $\pm$ 0.515	13.583 $\pm$ 0.669	8.894	0.000	Significant
Lay-up Shot	Score	18.250 $\pm$ 0.452	20.417 $\pm$ 0.515	10.952	0.000	Significant

#### Analysis and Discussion of Post-test Results

1. Both experimental groups exhibited statistically enormous upgrades, confirming the effectiveness of the cooperative integration approach of fragmented records in growing basketball shooting abilities.
2. The second experimental institution, which used the JWD tool, achieved more improvements in each the front pictures and lay-up shots. This suggests that the JWD device added a precious size to education via introducing simulated defensive demanding situations, requiring gamers to adapt their capturing strategies under stress.
3. The calculated T-values (eight.894 for front shot and 10.952 for lay-up shot) imply a exceptionally good sized difference in want of the second one experimental group, reinforcing the wonderful effect of incorporating the JWD device in ability improvement.
4. These effects validate the hypothesis that combining cooperative learning strategies with progressive schooling equipment (JWD device) complements talent acquisition, capturing accuracy, and standard player overall performance greater efficiently than traditional learning techniques by myself.



### 3.4 Discussion of Post-Test Results for Both Experimental Groups



By reading Table 2, it is obvious that statistically large differences exist inside the post-take a look at effects for each the front shot and lay-up shot abilities in basketball. The 2d experimental institution, which used the JWD tool similarly to the cooperative integration technique of fragmented information, showed advanced performance compared to the first experimental institution.

The researcher believes that the cooperative integration approach of fragmented statistics will increase scholar motivation, encouraging lively participation in the mastering system. This approach instills a feel of obligation in college students in the direction of their personal learning, as they have to collaborate to gain group achievement.

Furthermore, the improvement observed in the **second experimental group** is attributed to the **positive impact** of both **the cooperative learning strategy and the JWD device**. The use of the **JWD device** added **realistic defensive challenges**, making the learning process **more interactive and engaging**.

#### Supporting Literature

- **Okebukola (1989)** stated that **cooperative learning enhances student engagement** while also **reducing mental fatigue**. [5]
- Research agrees that **students in cooperative groups benefit more when they help one another**, as opposed to working **individually or competitively**.

The researcher supports these findings, emphasizing that **cooperative learning in sports education** fosters **comprehensive learning**, helping students develop **better technical skills, problem-solving abilities, and teamwork**. [6]

## Chapter Four: Conclusions and Recommendations

### 4.1 Conclusions

1. The **cooperative integration method of fragmented information** significantly and effectively improved **students' learning of the front shot and lay-up shot skills** in basketball.
2. The **Jumping Defensive Wall Device (JWD)** had a **positive impact** on improving **basketball shooting skills**, as evidenced by the statistical differences favoring the **second experimental group**.
3. The **JWD device reduced the instructor's workload** by minimizing the time required for **error correction and providing immediate feedback**.
4. The **cooperative integration method combined with the JWD device** proved to be a **highly effective teaching approach**, particularly benefiting the **second experimental group**.

### 4.2 Recommendations

1. The **cooperative integration method of fragmented information** should be **adopted** for teaching **basketball shooting skills** to students.
2. The **JWD device should be incorporated** into **basketball training** to **enhance shooting accuracy and learning outcomes**.
3. Instructors should actively **use the JWD device** to optimize **skill acquisition in front and lay-up shooting techniques**.

## References

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## Appendix (1)



## Appendix (2)

Week: First

- Objectives:
- Number of Students: 24

Educational Unit	First Unit
Educational Goal 1	Teaching students the front shot and lay-up shot in basketball using the JWD device (Front Shot, Lay-up Shot)
Day & Date	Tuesday, April 27, 2024
Location	Courts of the College of Physical Education and Sports Sciences – University of Al-Qadisiyah



<b>Educational Goal 2</b>	<b>Collaboration and Respect for Teammates</b>
<b>Duration</b>	<b>90 minutes</b>

No.	Lesson Sections	Duration	Groups	Activities	Organization	Notes
<b>Preparatory Section</b>						
- Introduction	5 min		- Setting up equipment, students lining up, attendance check, remarks on the lesson.	<b>Group (1)</b> x x x x x x x x		
- General Warm-up	5 min		- Standing, walking, light jogging with alternating arm rotation.	<b>Group (2)</b> x x x x x x x x	- Ensure proper warm-up execution.	
- Specific Warm-up	10 min		- Jogging with knee raises, regular jogging, flexibility exercises. Special warm-up to prepare for the main section.			
<b>Main Section</b>						
- Educational Part	15 min	<b>Group (1)</b> <b>Group (2)</b>	- General information on <b>front shot and lay-up shot using the JWD device.</b>			

- Explanation of **common mistakes**, emphasizing the **position of the ball, shooting speed, body positioning, and movement mechanics.**
- Observing the **JWD jump speed** while maintaining **ideal foot and hand placement** based on the **ball's position relative to the backboard.** | - Emphasizing **cooperative learning and JWD device utilization.** |  
| - Practical Part | 50 min || - **Drill 1:** Students start from a **ready position**, moving away from the ball's designated spot based on their chosen distance (**3m – 7m**), executing an **arched shot toward the hoop**, ensuring the ball is released at the **correct angle** for accuracy.
- **Drill 2:** Similar to Drill 1, but with increased **ball speed** while maintaining accuracy. | - Both groups practice the exercises for **10 minutes per drill.**
- **Emphasizing correct execution.**
- **Providing feedback to correct mistakes.**
- Increasing **repetitions** as per skill level within the allocated lesson time. |  
| **Concluding Section** | 5 min || - General **cool-down exercises** to return the body to its natural state.
- Students line up and **perform a dismissal salute.** |||