



## Designing an Electronic System for Visual Stimuli and Its Impact on the Accuracy of Setting and Spiking Skills in Volleyball Players

Sajad Abdul Wahed Abdul Khaliq<sup>1</sup>, Ali Qasim Ali Hussein<sup>2</sup>, Badr Nabeel Rajab<sup>3</sup>

DOI: [https://doi.org/10.37359/JOPE.V36\(2\)2024.2035](https://doi.org/10.37359/JOPE.V36(2)2024.2035)

<https://creativecommons.org/licenses/by/4.0>

<sup>1,2</sup> University of Baghdad, College of Physical Education and Sports Science.

<sup>3</sup> Ministry of Education.

**Article history:** Received 15/January/2024 Accepted 28/March/2024 Available online 28/June/2024

### Abstract:

The research aimed to enhance the accuracy of setting and spiking skills among the players of the University of Baghdad's volleyball team for the academic year (2022-2023) through a visual stimuli system designed by the researcher. The system works to develop the accuracy of two skills simultaneously during the operation of the system, through the accuracy of setting on an electronic board that contains numbers. Based on this, the setter prepares for the required position according to the number displayed on the board. The system also works to enhance the accuracy of spikes through lights that operate simultaneously with the numbers and within the opponent's area. Based on the location of the light that illuminates the area, the player performs a spike (either straight or diagonal) onto the illuminated area, according to the type of stimulus. This integrated approach not only improves the precision of spiking skills but also provides realistic game scenarios, enhancing training effectiveness. The researcher intentionally employed the experimental method for a single group with both pre-test and post-test. The research population and sample comprised players from the university volleyball team for the 2022/2023 season, who were students of the College of Physical Education and Sports Sciences, totaling 18 players. The research sample was intentionally selected, excluding the libero players,

<sup>1</sup> University of Baghdad, College of Physical Education and Sports Science, [sajjad.a@cope.uobaghdad.edu.iq](mailto:sajjad.a@cope.uobaghdad.edu.iq)

<sup>2</sup> Bachelor's degree, University of Baghdad, College of Physical Education and Sports Science, [ali.hussein1902@cope.uobaghdad.edu.iq](mailto:ali.hussein1902@cope.uobaghdad.edu.iq)

<sup>3</sup> Ministry of Education, [Moonbadr26@gmail.com](mailto:Moonbadr26@gmail.com)

of whom there were 2. In addition to excluding the two players involved in the pilot experiment, the sample size was thus (14) players, representing (77.778%) of this population. Following the procedural steps, statistical analyses, and verification of scientific principles and parameters, the researcher arrived at the final form of the study. The statistical analysis was conducted using the SPSS system to derive conclusions and applications aimed at improving the spatial accuracy of both researched skills based on their correlation with enhancing performance and motor control in the specific parts of each skill. The educational tool helped to define this free activity within the parameters of correct performance through the lighting controlled by the coach to direct the players' tasks and increase their attention in each part of the performance. This approach also catered to the detailed nuances required to showcase them along with proper skillful performance. Thus, the role of visual stimuli exercises is to facilitate the precise direction of the ball to the designated location through control and manipulation, by accelerating cognitive processes for players and enhancing their effectiveness. On the one hand, they support the motor pathway of the required skillful behavior and guide it, while also accelerating cognitive processes, or more precisely, increasing their effectiveness in organized training without exaggeration in the training environment. The researcher concluded that exercises involving visual stimuli within an innovative electronic system aid in enhancing the accuracy of the setting skill and improving the accuracy of the spiking skill in volleyball among the players of the University of Baghdad team.

**Keywords:** Visual Stimuli, Electronic System, Accuracy, Setting, Spiking.

## Introduction

Volleyball is considered one of the significant team sports practiced widely. It holds a prominent position as an engaging game, with its players characterized by various physical, technical, tactical, mental, psychological, and social abilities, which play a crucial role in achieving optimal performance in various basic skills throughout the match, enabling superior performance and excellence in competitions. This necessitates the integration of these abilities in different playing situations, as the training process encompasses several aspects, including physical, motor, and visual components. If the visual aspect does not function properly, it will impact the performance of the physical and motor aspects. The alternation of study periods from physical, skillful, and mental perspectives leads to better results for the enhancement of skill level (Al-Rabadi, 2001).

Attention stability is one of the fundamental mental components that enables volleyball players to accurately perceive stimuli, thereby making them more capable of responding and evenly distributing effort, culminating in the optimal performance of skills in play and competition. Additionally, it plays a significant and crucial role in performing the skills of setting and spiking because the setter can maintain their focus on the opponent's blocking wall and set the ball for

the teammate to strike in the open area. Similarly, in spiking, accuracy and visual stimuli are important for scoring points on the first attempt. Precision is a crucial motor skill for volleyball players, especially when their skill levels are evenly matched. The game is characterized by the small size of the court and rapid, unexpected movements, requiring players to exhibit a high degree of accuracy in setting and spiking skills at the maximum possible speed, particularly against opponent blocks and defenses. This is essential for outperforming the opponent in all skillful and tactical aspects of the game.

Al-Jabouri emphasizes that precision plays a prominent role in the game of volleyball, as the player is legally required not to hold onto the ball, as this increases the difficulty of performance and often necessitates quick and sudden actions. Therefore, it requires the player to possess high reaction speed, whether in defensive tactics in following the balls or in offensive tactics when participating in different play movements. Additionally, it necessitates making decisions in motor execution (Al-Jabouri,1999). The system works to develop the accuracy of two skills simultaneously during the operation of the system. This is achieved by enhancing the accuracy of setting on an electronic board that contains numbers. Consequently, the setter prepares for the required position according to the number displayed on the board. Furthermore, the system also enhances the accuracy of spiking by utilizing lights synchronized with the numbers and positioned in the opponent's area. Depending on the location of the illuminated area, the player performs either a straight or diagonal spike to the illuminated region based on the type of stimulus.(Mousa, A. M., & Kadhim, 2023)

### **Previous Studies**

A study by Hussam Hussein Daham (2019) titled: The Effect of Special Exercises Using a Device Designed for Visual Stimulus on the Accuracy and Response to the High Setting Skill in Volleyball.

The study aimed to develop specialized exercises using a designed visual stimuli device to enhance the accuracy and response of the high-setting skill near the net for young volleyball players. Additionally, the study sought to investigate the effect of these specialized exercises using the designed visual stimuli device on the development of accuracy and response among young volleyball players in the skill of high setting near the net. The researcher used an experimental method using the single-group pretest-posttest design, chosen for its suitability to the nature and objectives of the study. The research population comprised players from the National Center for Athletic Talent Care in Iraq, totaling 36 players. The research sample was selected purposively, consisting of 6 players specializing in the setting skill from the youth category in Baghdad (Daham, 2019).

---

A study by Faiz Imad Hassan Al-Taie (2018) titled: The Impact of Exercises with the (Verti Max) Device on Explosive Power, Response Speed, and Skillful Flowing Behavior in the Accuracy of Spiking and Blocking in Volleyball.

The study aimed to: Develop exercises using the Verti Max device to enhance explosive power, response speed, and skillful flowing behavior for the skills of spiking and blocking in youth volleyball. Additionally, it sought to understand the impact of these exercises with the Verti Max device on explosive power, response speed, skillful flowing behavior, and the accuracy of spiking and blocking among young volleyball players. The researcher also used the experimental method with a design for both control and experimental groups. The research population was defined as the volleyball players from clubs in Karbala (Al-Hindiya, Husseiniya, Imam Al-Muttaqin, Al Rawdatain), totaling (48) players. The research sample consisted of players from the Al-Rawdatin club, totaling (12) players. It was divided into two groups: the first was the control group and the second the experimental group, with five players in each group after excluding the setters and the liberos, if present, due to their role in performing the setting tasks. Exercises were prepared using the (Verti Max) device. (Al-Taie, 2018)

A study by Jalila Jawir Abdullah (2016) titled: The Impact of Special Exercises According to Visual Stimuli on Developing Visual Concentration Power and the Accuracy of Setting Skill for Female Volleyball Players.

The study aimed to prepare special exercises according to visual stimuli to develop visual concentration power and the accuracy of the setting skill for female volleyball players. Additionally, the research aimed to identify the impact of these special exercises according to visual stimuli on developing visual concentration power and the accuracy of the setting skill for female volleyball players. The research sample consisted of players from the Al-Shabab Sports Club for the 2015-2016 sports season, totaling (15) players. The research test was conducted using a deliberate method, and the training methodology was implemented with a single group design involving both pre-test and post-test to align the nature of the research. (Abdullah, 2016).

A study by Jassim Mohammed Rasheed (2015) titled: The Impact of the Educational Curriculum Using a Ball Launching Device on the Accuracy of Performance for the Spiking Skill in Volleyball for Beginners.

The study aimed to: Identify the impact of the educational curriculum using a ball-launching device on the performance accuracy for the spiking skill in volleyball for beginners.

The researcher employed the experimental method as it was suitable for the study sample. The research population consisted of second-year students at the College of Physical Education / University of Baghdad for the academic year (2014-2015), totaling (212) students distributed across seven academic sections. The research sample was selected randomly through a lottery process, consisting of (two sections) of male students divided into experimental and control groups, with (16) students in each group. Thus, the total number of students in the research sample was (32) students. (Rasheed, 2015) and (Sakran & Shehab, 2023)

A study by Dina Abdul Hussein Badn (2015) titled: Visual Perception and Its Relationship with the Accuracy of Performance in Diagonal and Straight High Spiking in Youth Volleyball.

The study aimed to identify the relationship between visual perception and the accuracy of performance in diagonal and straight high spiking in volleyball. The researcher utilized a descriptive method with a correlational approach, and the research population was purposively selected, consisting of youth club players in Baghdad for the season (2014-2015). The research sample was selected through purposive sampling, consisting of players from Baghdad clubs (Al-Shorta and Al-Sina'ah), totaling (24) players aged between 16 to 18 years. Two setters and two libero players were excluded, constituting 14% and 28%, respectively, of the original population. (Badn, 2015).

## Method and Tools

**Research Methodology:** Based on the current research problem, the experimental method was adopted, which is defined as the objective observation of a specific phenomenon occurring in a situation characterized by strict control and involves one or more varied variables, while other variables are controlled. (Alawi and Rateb, 2017) The researcher opted to use the experimental method for a single group with both pre-test and post-test.

**Research Population and Sample:** The scope of the research population is represented by the university volleyball team players for the season (2022/2023) from the students of the College of Physical Education and Sports Sciences, totaling (18) players. As for the research sample, they were selected purposively, after excluding the libero players, numbering (2), in addition to excluding the players involved in the pilot study, also numbering (2). Consequently, the sample size comprises (14) players, constituting 77.778% of this population. Details of the sample are provided in the following table:

Table (1) illustrates the homogeneity of the research sample players in some internal variables. The coefficient of skewness for normal distribution is specified between (+1).

Variables and Their Measurement Units	Number	Arithmetic Mean	Standard Deviation	Skewness Coefficient
Chronological Age (months)	14	263.93	2.433	-0.315
Body Height (cm)	14	186.14	10.068	0.073
Body and Arm Length with Arms Extended Upwards (cm)	14	220.21	9.258	0.316
Weight - Mass (kg)	14	77.57	3.345	0.135

#### The tools used:

- Arabic and foreign sources and references.
- A questionnaire form.
- Tests and measurements.
- An assistant work team.

**Research Variables Identification:** Variables were identified via a paper questionnaire distributed to volleyball instructors at the College of Physical Education and Sports Sciences. Visual stimuli (accuracy) were selected due to their significant importance in volleyball and appropriateness for the study's context as well as compatibility with the device designed to enhance the targeted skill.

**Tests Used:** Selecting tests for the research was a carefully considered process, ensuring that chosen methods accurately measure the desired precision within the study's scope. Therefore, the researcher created a questionnaire to select the most suitable tests for measuring accuracy. Two tests were selected out of a total of (9) tests. The questionnaire was presented to volleyball specialists at the College of Physical Education and Sports Science, University of Baghdad, where experts from the volleyball professors were all consulted.

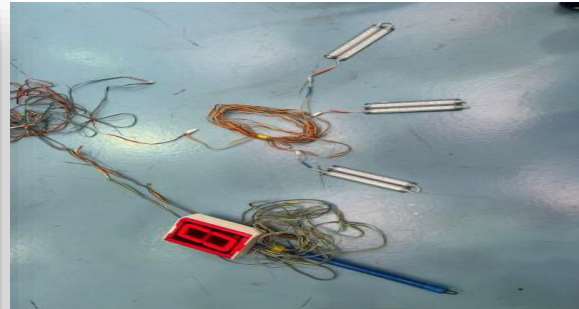
#### The tools and equipment used: -

- Official volleyball court
- Regulation volleyball (20 balls, MIKASA brand)
- Colored adhesive tape and office supplies
- Measuring tape (2)
- Fox 40 whistles (2)
- Visual stimuli device with remote control (2) and board (1)
- Camera (1)



### Design of the Electronic System for Setting and Spiking Skills.

- An electronic board measuring 15cm x 20cm, consisting of a digital display that randomly shows numbers representing the volleyball court's net lines (2, 3, 4).
- Three green LED lights measuring (20 cm length) x (6 cm width) x (0.8 cm height) mounted on the backline numbers of the volleyball court (1, 6, 5).
- Electrical wires are connected between the number board and the lights.
- A remote-control unit for the lights and numbers.



**The visual stimuli system, its accessories, and modifications made by experts (Appendix 1).**

#### **The operation method of the system**

The coach passes the ball to the setter. Then, one of the numbers (2-3-4) appears, and simultaneously, a light illuminates one of the opponent's court areas (1,6,5). The setter then prepares the ball for the player positioned at the indicated number, who spikes the ball towards the lit area. After the spike is executed, the lights on the court and the numbers on the board turn off, and the attempts are repeated according to the coach's instructions.

**The exercises available on the system and applied to the research sample are as follows:**

- The number displayed on the setter's board is (2), and the light for the spiker is (1). Therefore, the execution involves a diagonal spike.
- The number displayed on the setter's board is (2), and the light for the spiker is (5). Therefore, the execution involves a straight spike.
- The number displayed on the setter's board is (4), and the light for the spiker is (5). Therefore, the execution involves a diagonal spike.
- The number displayed on the setter's board is (4), and the light for the spiker is (1). Therefore, the execution involves a straight spike.
- The number displayed on the setter's board is (3), and the light for the backline spiker is (6). Therefore, the execution involves a straight quick spike.
- The difficulty of the exercises was progressively increased by adding a blocking wall to all the exercises available on the electronic system.

**Identifying the tests used in the research:**

The selection process for the tests used to measure skills related to the phenomenon being studied in the research areas must be appropriate for measuring each skill among the (9) tests. The study included (5) tests for the skill of setting accuracy in volleyball and (4) tests for spiking skill. The researcher created a questionnaire to select the most suitable tests for measuring each skill. This questionnaire was presented to a group of professors and specialists in volleyball from the College of Physical Education and Sports Science at the University of Baghdad, totaling (13) experts.

After analyzing the questionnaire responses and calculating the percentage, the tests that received the most frequent selection were nominated as follows:

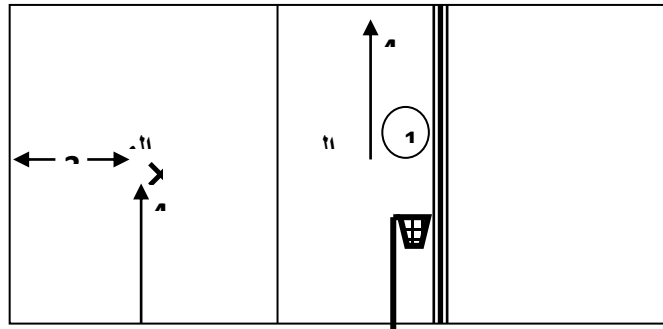
- A test for accuracy in high-setting.
- Tests for accuracy in straight and diagonal spiking.

**Firstly, the high-setting accuracy test:** (Al-Tarfi, 2014, p. 94)

- The purpose of the test: To measure the accuracy of setting close to the net.
- The tools used: A volleyball court, a net with a height of (243 cm), and (10) balls, along with a basketball hoop stand with a ring diameter of (60 cm) and raised above the upper edge of the net by (70 cm).



A circle with a diameter of 1 meter is drawn, its boundary touching the midline, with its center 4.5 meters away from the sideline, designated for the tester's position. The stand is placed on the



side, 30 cm from the net, as illustrated in Figure 3, where a mark (x) is indicated 2 meters from the end line and 4.5 meters from the sideline (this mark is designated for the coach's standing position).

**Performance Specifications:**

The coach throws the ball in an arc upwards towards the player standing in the circle, aiming to get the ball through the hoop. Each tester has (10) attempts to set the ball into the hoop from within the circle using both hands.

- 3 points for each attempt that successfully enters the hoop without touching the rim.
- 2 points when the ball enters the hoop and touches the rim.
- 1 point when the ball touches the rim without entering the hoop.
- 0 points for any attempt that does not meet the above criteria. The maximum score for the test is (30) points.

**Secondly, the Test of Straight and Diagonal Spiking Accuracy: (Al-Tarfi, 2014)**

- The purpose of the test: To measure the accuracy of spiking in linear (straight) and diagonal directions.
- The tools used: (30) volleyball balls, a volleyball court, and two mattresses placed as shown in Figure (4), positioned 5 cm away from the sideline markings.

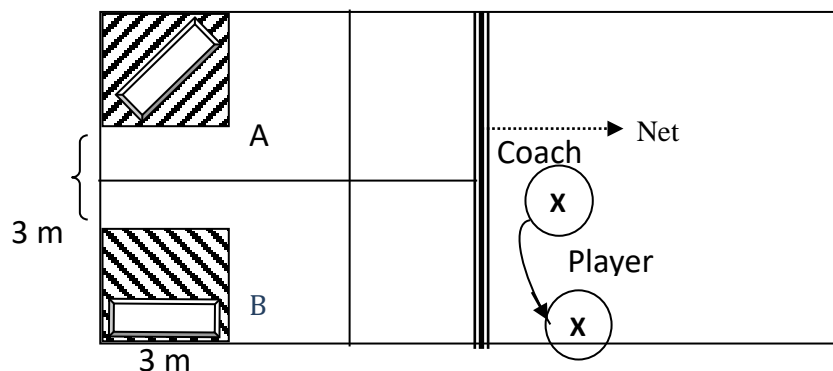


Figure (4) Straight and Diagonal Spiking Accuracy Test

**Performance Specifications:** Spiking is performed from position (4). Preparation is done by the coach from position (3). Testers are required to execute (15) diagonal spikes towards the mattress located at position (5) and another (15) straight spikes towards the mattress at position (1).

#### Scoring:

- 4 points for each spike that lands the ball on the mattress.
- 3 points for each spike where the ball lands in the designated area.
- 2 points for each correct spike that lands the ball in areas (A) and (B).
- 0 points for any action that does not meet the above criteria. The maximum score for the test is (60) points.

#### Field Research Procedures

**Pre-tests:** Following a pilot study on the pilot study sample to verify the validity of the tests and the electronic system on Sunday (19/2/2023), pre-tests for the research sample were conducted on Tuesday (21/2/2023) in the volleyball and basketball courts at the College of Physical Education and Sports Science, University of Baghdad.

**Main Experiment:** The visual stimuli exercise with the electronic system were implemented on Wednesday (22/2/2023). The experiment continued on the research sample for three consecutive weeks, with an average of (4) units per training week according to their specialized training program for participation in the Iraqi Universities Championship. The specialized exercises were applied with a total of 12 training units.

**Post-tests:** Following the main experiment, the research sample underwent post-tests on Monday 13/03/2023, in the volleyball court hall and the basketball court hall at the College of Physical Education and Sports Science, University of Baghdad.

**Results and Discussion:** Following completing the experiment, the results were processed automatically using the SPSS system, including the extraction of percentage values, arithmetic mean, standard deviation, skewness, and the t-test for related samples, as shown in the table below.

Table (2) illustrates the results of the pre-tests and post-tests.

Tests and Measurement Units	Skill	comparison	Arithmetic mean	Standard deviation	Mean difference	Deviation of differences	(t)	(Sig)	Significance of the Difference
Skill Accuracy (Score)	Setting	Pre-test	20.43	2.344	4.571	2.243	7.624	0.000	Significant
		Post-test	25	1.24					
	Spike	Pre-test	27.43	1.989	5	2.602	7.191	0.000	
		Post-test	32.43	1.016					

N= (14), Sig (Significance)  $\geq$  (0.05) at a significance level of (0.05) and degrees of freedom (n)-(1).

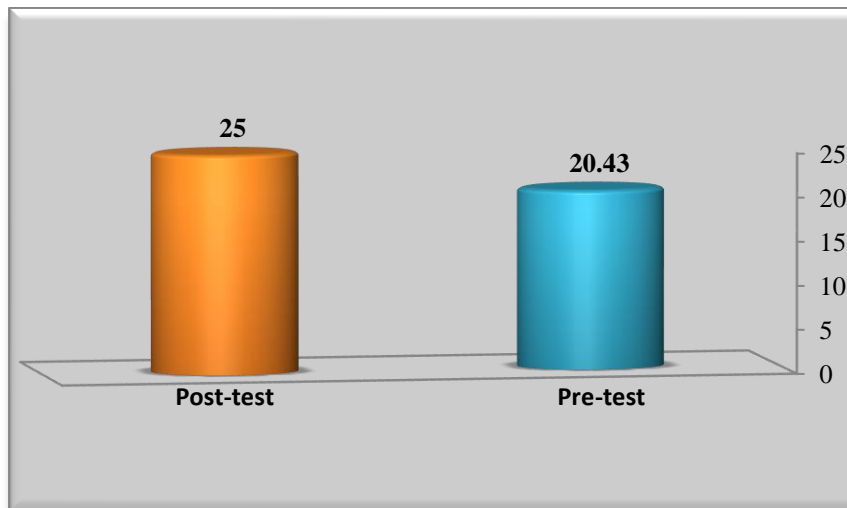


Figure (5) illustrates the pre-test and post-test arithmetic means for setting accuracy.

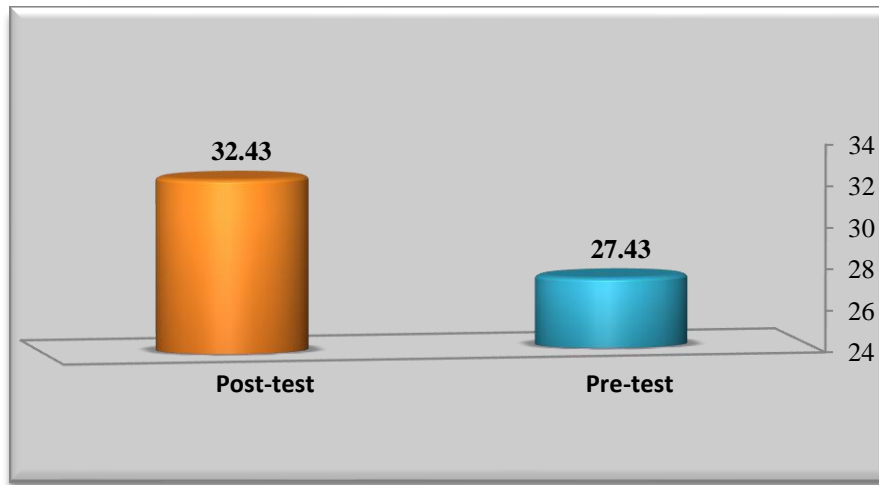


Figure (6) illustrates the pre-test and post-test arithmetic means for spiking accuracy.

The results in Table (2) show an improvement in spatial accuracy for both investigated skills, correlating this enhancement with performance and motor control improvements in each skill's components. The educational tool, through controlled lighting by the coach, effectively guided the players' tasks and heightened their focus in every performance section, thereby identifying this free activity within the correct performance parameters. Attention is the primary cognitive process in enhancing spatial accuracy, followed by concentration on specific skill details to develop a cognitive framework within the player. By recognizing crucial elements of the ball direction using controlled lighting and defining the ball's trajectory according to the designated play area, this method assists in creating an appropriate motor program. This program aligns with the spatial accuracy model for each skill, incorporating the necessary fine details for correct skill execution. Thus, visual stimuli exercises are essential for accurately directing the ball to targeted locations by enhancing control and cognitive speed, thereby improving players' effectiveness. These exercises not only support and guide the motor execution of required skills but also boost cognitive efficiency in structured training environments, optimizing the training impact without overstating effects.

Mohammed Al-Arabi Shamoun mentions that "It is necessary to increase the ability to focus and concentrate on relevant stimuli so that the player can effectively deal with challenging situations" (Shamoun, 2017).

Furthermore, "Attention directs awareness towards relevant stimuli, making them perceptible to the senses... It is the reciprocal relationship between the learner and the environment, and attention is closely linked to thinking and observation" (Rateb, 2000).

The researcher attributes the emergence of this result to the organized light stimuli contained in the designed tool, which achieved multiple purposes in a single action. This includes defining the

motor pathway and providing the players with continuous feedback during performance and final feedback on accuracy. Thus, it serves a reinforcing function to solidify correct responses, as reinforcement plays a significant role in establishing connections between stimulus and response.

Indeed, "the player must realize that technology is a friendly tool for them in a productive and active environment. The crucial aspect is its proper use and selecting suitable situations for its utilization to benefit the player, achieve training objectives, and facilitate innovative work in sports activities" (Ubaid, 2010) and (Easa et al., 2022)

Additionally, "feedback has benefits in refining and developing performance, providing the learner with movement-specific information, and guiding their response towards the motor goal during educational situations. Feedback also serves the function of providing us with information about the movement (informational function). It can be used as a reward when the information is encouraging about nearing the goal (motivational function), and it can become a strong incentive for learning (incentive function)" (Wajeih, 2001) and (Salih, I. H., Yaseen, A. M., Naseer, K. J., Attieh, A., & Kadhim, 2024)

Furthermore, "Through exercise repetition, the connection between the brain and muscles is strengthened, and repetition helps to disregard external stimuli in movement performance. This sequence serves in subjecting the body to changes in improvement in strength and athletic skill in the end" (Lerner & Brenda, 2017) and (Salman et al., 2022)

"Accuracy is a process involving all the senses of an individual and relies on various types of training with specific units aimed at developing different pathways in movement, strength, distance, and time through diverse paths of motor tools in all presented skills. This highlights the significance of training in achieving the highest level of precise performance" (Al-Shathli and Bou Abbas, 2010) and (Kadhim, 2023a)

Furthermore, "An athlete who trains toward a specific goal will have an incentive in his work, and working without a goal is futile and negligent. Therefore, the sports coach should assist the athlete in setting a suitable goal that he can achieve to give value to the training. This helps the athlete understand his progress through the postures and movements performed by the body or some parts of the body, which are practised or performed according to scientific principles and educational principles aimed at building the body to achieve the best possible performance in various specialized games, activities, and events" (Al-Dulaimi, 2011) and (Ahmed Fadhil Farhan Mohammed Jawad Kadhim, 2016)

Moreover, the skill of spiking also relies on the setter, who prepares the ball at various heights and directions to match the attacking player's capabilities. The attacker is characterized by their height, quick decision-making, (Falah & Khaleq, 2023) explosive power in jumping and hitting, and precision in performance. Additionally, they need proper landing techniques and readiness to defend their position. Not all players can perform this skill due to differences in their body



composition, physical abilities, and motor skills. Achieving proficiency in spiking requires coordination, adjustment, and balance. Moreover, the player should demonstrate intelligence and quick reactions. (Mahmood et al., 2023)

In addition to considering the changes in terms of the distance and proximity of the teammate setter and the net, working on harmony and timing during the precise execution of skills is essential. The attacking player, while executing offensive duties, should observe the movements of teammates and the ball's direction as it crosses into the field, receiving and directing it towards the setter. This moment marks the beginning of the attacking player's readiness to execute the offensive duty assigned. (Badn, 2015) and (Kadhim, 2023b)

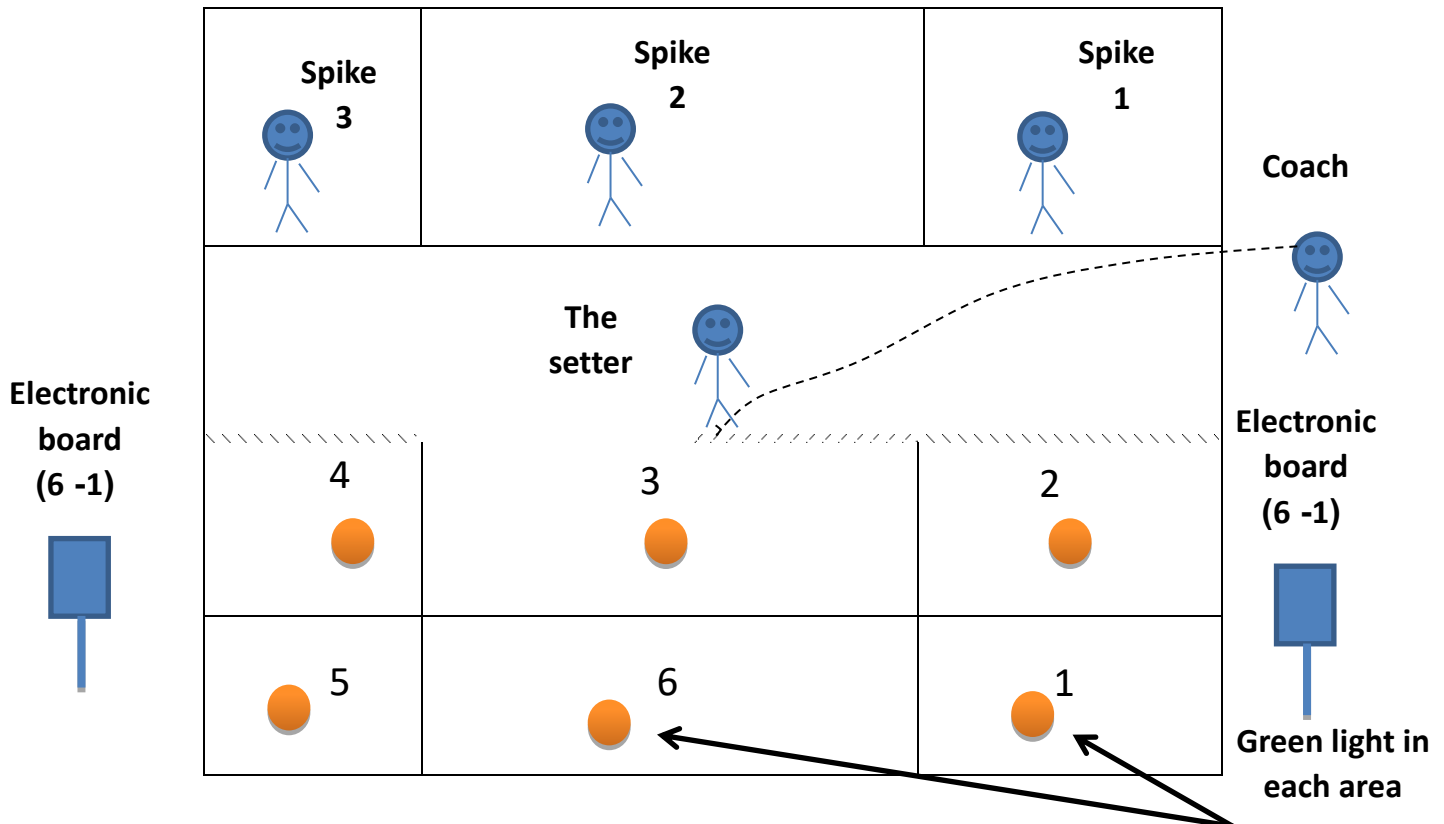
### **Conclusion and Recommendations:**

- 1- Visual stimuli exercises through an innovative electronic system help improve the accuracy of setting skills among the players of the University of Baghdad's volleyball team.
- 2- Visual stimuli exercises with an innovative electronic system contribute to improving the spiking accuracy in volleyball among players of the University of Baghdad team.
- 3- It is essential to work on developing response speed for a number reflector; for instance, if number (1) appears, the hitter hits the ball to position number (5).
- 4- It is essential to work on developing both response speed and accuracy by using a board for the hitter that displays the number of the area they should target.
- 5- It is necessary to work on developing an electronic system with colour reflection by using two colours, red and green. If the green colour appears in area number (1), the hitter hits the ball in the area (1). However, if the red colour appears in a certain area, the hitter hits the ball in the opposite direction of that colour, meaning in area number (5).
- 6- It is essential to implement visual stimuli exercises using an electronic system for students in colleges, volleyball players, and all age categories.

### **Appendix (1) Operation of the Visual Stimuli Device and Its Accessories:**

- Two boards (2) are each hung on a pole supporting the net.
- We have six green lamps distributed across the playing areas, which operate in conjunction with the board.
- In the straight spiking skill; for example, if number (6) appears on the board, the green light in area number (6) activates. The setter, seeing the number on the board, prepares the ball for the spiker in position (2). The spiker, observing the green light in the opponent's area number (6), proceeds to hit the ball straight into the area (6), as shown in the figure below.
- As for, the diagonal spiking skill, if, for example, number (1) appears on the board, the green light in area number (1) activates. The setter, noticing the number, prepares the ball for the spiker in position (3). The spiker, seeing the green light in the opponent's area number (1), then hits the ball diagonally into the area (1), as shown in the figure below.

- In the case of deceptive spiking; if, for example, number (2) appears on the board and the green light in area number (2) lights up, the setter, observing the number, prepares the ball near the net for the spiker in position (1). The spiker, seeing the green light in area number (2) of the opponent's zone, performs a deceptive spike in area (2), as depicted in the figure below.



**The modification that occurred in the operation method of the device, according to the recommendations of the expert committee.**

- A board (number 1) is hung on the net's supporting pole, positioned on the players' left side who execute the spike.
- We have three green lamps distributed across playing areas numbered (1, 6, 5) which operate in conjunction with the board.
- The setter is positioned in area (1), and the setting is determined by the numbers (2-3-4) displayed on the setter's board.
- In the case of deceptive spiking, the committee's recommendations resulted in the elimination of this paragraph.

---

## References

- Abdullah, J. J. (2016). The effect of special exercises based on visual stimuli on developing visual concentration power and accuracy of setting skill for female volleyball players. *Journal of Sports Science*, (8). Diyala.
- Ahmed Fadhil Farhan Mohammed Jawad Kadhim, G. M. S. (2016). The effectiveness of injury prevention program on reducing the incidence of lower limb injuries in adolescent male soccer players. *Injury Prevention*, 22(Suppl 2, 346.  
<https://www.proquest.com/openview/fd995719bc359d2e05fa6fe346bed0f6/1?pq-origsite=gscholar&cbl=2031963>
- Alawi, M. H., & Rateb, O. K. (2017). Contemporary Trends in Scientific Research for Physical Education and Sports Sciences. Cairo: Dar Al-Fikr Al-Arabi.
- Al-Dulaimi, N. A. Z. (2011). Selections in Motor Learning. Printing and Design House.
- Al-Shathli, A. F., & Bou Abbas, Y. A. R. (2010). Scientific principles for teaching physical exercises. Kuwait: Publications of That Al-Salasil.
- Al-Taie, F. I. H. (2018). The Effect of Verti Max Exercises on Explosive Power, Reaction Speed, and Skillful Performance Accuracy in Spiking and Blocking in Volleyball. Karbala: College of Physical Education and Sports Sciences, University of Karbala.
- Al-Tarfi, A. S. A. (2013). Applied tests in physical education: Physical, motor, and skill assessments. Al-Noor Library for Printing, Publishing, and Distribution.

- 
- Badn, D. A. H. (2015). Visual perception and its relationship with the accuracy of high diagonal and straight spiking skills in youth volleyball. *Journal of the College of Physical Education, University of Baghdad*.
- Daham, H. H. (2019). The effect of specialized exercises using a device designed for visual stimulus on accuracy and response for the high-setting skill in volleyball. *Journal of the College of Physical Education, University of Baghdad*.
- Easa, F. A. W., Shihab, G. M., & Kadhim, M. J. (2022). the Effect of Training Network Training in Two Ways, High Interval Training and Repetition To Develop Speed Endurance Adapt Heart Rate and Achieve 5000 Meters Youth. *Revista Iberoamericana de Psicología Del Ejercicio y El Deporte*, 17(4), 239–241.
- Falah, A. A., & Khaleq, S. A. W. A. (2023). Building and legalizing a test for evaluating the tactical learning of the footwork for the foil fencer in the fencing game. *Mustansiriyah Journal of Sports Science*, 5(2), 170–180.
- Kadhim, M. J. (2023a). Evaluation Of The Existence Of Gender Disparities In Iraq. *International Journal of Social Trends*, 1(1), 10–16.
- Kadhim, M. J. (2023b). Examining The Relationship Between Social Classes And The Culture Of Poverty : A Case Study. *International Journal of Social Trends*, 1(1), 23–27.
- Khaleq, S. A. W. A., Hussein, H. K., & Qusay, M. (2020). " Analyzing the Empowerment Reality of National Team Coaches for Some Individual Olympic Games. *International Journal of Psychosocial Rehabilitation*, 24(08).

---

Mahmood, H. A., Mohammed, P., & Kadhim, J. (2023). Special exercises for some physical , kinetic and electrical abilities accompanied by symmetrical electrical stimulation in the rehabilitation of the muscles of the legs for patients with simple hemiplegic cerebral palsy. *Pakistan Heart Journal*, 56(01), 580–595.

<http://pkheartjournal.com/index.php/journal/article/view/1291>

Mousa, A. M., & Kadhim, M. J. (2023). Nmusing an innovative device to improve the efficiency of the anterior quadriceps muscle of the injured knee joint after surgical intervention of the anterior cruciate ligament in advanced soccer players. *Semiconductor Optoelectronics*, 42(1), 1504–1511.

Rasheed, J. M. (2015). The effect of an educational curriculum using a ball-launching device on the accuracy of performance in the spiking skill for volleyball beginners. *Journal of the College of Physical Education*, University of Baghdad.

Rateb, O. K. (2000). *Training Psychological Skills: Applications in the Sports Field*. Cairo: Dar Al-Fikr Al-Arabi.

Sakran, M. A. S. A. J., & Shehab, G. M. (2023). The use of an auxiliary device and its impact in teaching the skill of Russian rotation on the pommel horse device for junior artistic gymnastics. *Wasit Journal Of Sports Sciences*, 14(2).

Salih, I. H., Yaseen, A. M., Naseer, K. J., Attieh, A., & Kadhim, M. J. (2024). THE IMPACT OF COMPETITIVE SPEED EXERCISES ON JUNIOR BOXERS' EFFECTIVENESS OF SKILL PERFORMANCE AND COUNTERATTACK SPEED. *International Development*





---

*Planning Review*, 23(1), 149–162.

- Salman, S. M., KADHIM, M. J., & SHIHAB, G. M. (2022). The effect of special exercises in the rehabilitation of the shoulder muscle for the youth wrestling category. *International Journal of Early Childhood Special Education*, 14(5)Shamoun, M. A. (2017). *Applied Sports Psychology: A Guide for the Psychologist and Athlete*. Cairo: Dar Al-Fikr Al-Arabi.
- Ubaid, W. (2010). *Education in light of standards requirements and thinking culture* (2nd ed.). Amman, Dar Al-Masira for Publishing, Distribution, and Printing.
- Wajeeh, M. (2001). *Learning and Training Scheduling*. Amman: Wael Publishing House.