



The Impact of the (REACT) Strategy Using Small Groups Style on Attention Intensity and Learning Basic Tennis Skills for Students

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DOI:

<https://doi.org/10.47134/jpo.v3i3.2472>

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Received: 25-12-2025

Accepted: 25-01-2026

Published: 25-02-2026



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Abstract: The importance of research lies in reaching the most effective and effective methods and strategies for learners to achieve the best results in the least time and effort, while raising the level of concentration to achieve the desired goal and make playing the game fun. The problem with the research is the answer to the question: Does the REACT strategy contribute to higher attention and learning tennis skills compared to the traditional method? The aim of the research is to identify the effect of the REACT strategy and the strategy followed on the attention acuity and learning of basic tennis skills for students. The researchers used the experimental method according to the design of the two equal groups with pre- and post-tests to suit the nature and problem of the research. The following tests were used to measure the appearance of attention, the transmission accuracy test, and the front and rear ground blow tests. After conducting the scientific basis of the tests, the researchers used the statistical package (SPSS) to process the results statistically and using appropriate statistical methods. After presenting, analyzing and discussing the results, Mal concluded the following: The REACT strategy has a positive and effective role in attention deficit hyperactivity and learning basic tennis skills for the students of the experimental group, the method used has a positive role on attention deficit hyperactivity and learning basic tennis skills for the students of the control group, the experimental group that applied the REACT strategy is superior to the control group that applied the method used in attention acuity and learning basic tennis skills for students.

Keywords: REACT Strategy, Attention Deficit Hyperactivity Disorder, Basic Skills, Tennis

Introduction

Modern educational strategies are considered one of the most critical elements relied upon in the educational process to achieve effective learning. Therefore, crystallizing educational situations into practical strategies implemented by the teacher in lessons emphasizes the effective and active role of the learner, in addition to the effectiveness of learning based on understanding, comprehension, and retention. Despite the diligent work and significant continuous effort exerted by the teacher—which constitutes an important part of the learning process—they cannot accomplish all that is required without the provision of a positive educational environment supported by sufficient capabilities and

time. This is a major factor in providing the learner with the required experiences, information, knowledge, and skills.

From this standpoint, numerous and varied educational strategies have emerged that place the student at the center of the educational process, making their role effective and vital in order to enhance learning opportunities while ensuring learning is meaningful.

Among these strategies is the (REACT) strategy, which is "considered modern in the educational process and is based on active and constructivist learning. It can be employed in various educational programs. The name is an acronym for five key main steps or components: Relating, Experiencing, Applying, Cooperating, and Transferring. These steps can be applied in the physical education program in both theoretical and practical aspects".

Physical education is one of the programs of the educational process, encompassing practical and theoretical subjects. Among these subjects is Tennis, which has basic skills considered the pillar and foundation upon which the game is built. Therefore, it is essential to focus on learning these skills and presenting everything new and effective in the learning process to reach the optimal level and achieve the goal of the educational process. Hence lies the importance of the research in arriving at the most influential and effective methods and strategies for learners to achieve the best results with the least time and effort, while raising the level of focus to achieve the desired goal and adding enjoyment to the practice of the game.

Research Problem

Through the researchers' review and follow-up of research and studies related to the educational process and learning tennis skills, and through their experience in the field of teaching, they observed that the prevailing or traditional educational strategies mostly rely on verbal explanation (indoctrination) and the performance of a live kinetic model by the subject teacher. This is in addition to teaching procedures that lack the positive and effective participation of students, leading to the emergence of boredom and tedium, and distancing them from their desires and needs, which represent the stimulation of their motivation, interest, and sense of enjoyment during performance and learning.

From this standpoint, the researchers decided to conduct a study to put forward some solutions to this problem by applying a learning strategy during the implementation of educational units specifically for teaching basic skills: the REACT strategy. This aims to make the learner the center of the educational process and an active participant in it to reach more effective positive results and achieve the goals of the educational process.

The research problem lies in answering the question: Does the REACT strategy contribute to raising attention intensity and learning tennis skills compared to the traditional method used?

Research Objectives:

1. To identify the effect of the REACT strategy and the traditional strategy on attention intensity and the learning of basic tennis skills for students.
2. To identify the preference of effect between the REACT strategy and the traditional strategy on attention intensity and the learning of basic tennis skills for students.

Research Hypotheses:

1. There are statistically significant differences between the results of the pre- and post-tests for the control and experimental research groups in attention intensity and the learning of some basic tennis skills for students.
2. There are statistically significant differences between the results of the post-tests for the control and experimental research groups in attention intensity and the learning of basic tennis skills for students.

Research Domains:

- 1-5-1 Human Domain: Third-year students at the College of Physical Education and Sports Sciences, University of Anbar, for the academic year 2024–2025.
- 1-5-2 Temporal Domain: From February 3, 2025, to May 5, 2025.
- 1-5-3 Spatial Domain: Outdoor tennis courts at the College of Physical Education and Sports Sciences, University of Anbar.

Defining Terms

- REACT Strategy: It is "a strategy in which new content is linked to real-life context, problem-solving, and communicating with others through cooperation and transferring knowledge to a new context".
- Attention Intensity: It is "one of the manifestations of attention, meaning the level of clarity of attention and its accuracy in detecting subtle and small differences between things and events, indicating the integrity of the nervous system in responding when receiving and processing information quickly".

Methodology**Research Method:**

The researchers used the experimental method with a design of two equivalent groups with pre- and post-tests, due to its suitability for the nature and problem of the research (Khalaf et al, 2024) (Mohammed et al, 2025) (Omar et al, 2025).

Research Community and Sample:

The research community was determined purposively as the third-year students at the College of Physical Education and Sports Sciences – University of Anbar for the academic year 2024-2025, totaling (87) students. The research sample was selected randomly (by lottery), totaling (30) students distributed equally into two groups. The control group consisted of (15) students from Section B, and the experimental group consisted of (15) students from Section C. The sample represented a percentage of (34.48%) of the original population.

Devices, Tools, and Data Collection Means:

- Devices: HP Laptop, Stopwatch (1).
- Tools: Regulation tennis court, Tennis rackets (40), Tennis balls (40), Tennis net, Metric measuring tape, Whistle, Wall, Colored adhesive tape.

- Data Collection Means: Arabic and foreign sources, International Information Network (Internet), Tests and Measurement, Attention Intensity Scale, Data Collection Form.

Tests Used in the Research:

1) Bourdon-Anfimov Test to Measure Aspects of Attention

The researchers used the (Bourdon-Anfimov) test to measure aspects of attention. This test is applied and standardized for the Iraqi environment. It is considered a test specifically for athletes and is used to measure five aspects of attention, one of which is Attention Intensity. The test consists of a paper containing (31) lines of Arabic numerals distributed in groups. Each group consists of (3-5) numbers. Each line contains 10 groups, and the sum of the numbers is (40). Thus, the test contains (310) groups and (1240) numbers. These numbers were placed in a precise sequence and arrangement, ensuring they are regularly distributed but unequal to ensure they cannot be memorized by the examinee.

- Method of Execution: Upon the word "Start," the examinee turns over the test form at the moment the watch is started and begins crossing out the number 47 found at the end of each group.
- Test Time: One minute only.
- Correction and Calculation of Results:
 1. Count the total number of digits the examinee reached during the one minute up to the word "Stop" (Total volume of the viewed part), symbolized by (A).
 2. Count the number (47)s that the examinee crossed out in the viewed part, symbolized by (C).
 3. Count the number of digits the examinee crossed out by mistake in the viewed part, symbolized by (W).
 4. Count the number of omitted digits that the examinee did not cross out in the viewed part, symbolized by (O).
- The level of attention intensity is calculated using the following equation:

$$\text{Attention Intensity} = \frac{(\text{Correctly Crossed} - \text{Incorrectly Crossed}) \times \text{Viewed Digits}}{\text{Correctly Crossed} + \text{Omitted Digits}}$$

62479	385	2496	2749	64279	583	6942	2497	6492	2947
2974	2946	6492	583	2947	2496	538	92476	2497	67429
2749	385	2947	2496	67249	6492	2497	385	2497	29476
2947	2942	2947	67429	2497	583	2496	2492	2946	2497
385	6492	64279	2947	2749	24987	67249	6497	2496	385
583	2496	385	9476	2497	583	6492	2947	62497	67429
2497	385	64279	583	2946	3492	67249	2496	583	92476
2974	358	2497	583	67429	6742	2947	6492	67249	2946
2946	92476	6429	385	2497	6749	2496	2976	67429	375
67249	6479	583	6479	2496	385	6942	2492	2947	62479
6429	2479	385	2947	62479	29246	583	6492	583	67429
2947	2492	2497	583	6492	2949	6479	29247	6942	358
2497	583	2947	2946	2496	92476	538	2974	68429	2946
9276	2492	2496	583	67249	2492	2947	2749	29476	583
67429	2497	6492	2497	2496	385	2629	2946	538	29476
6492	385	64279	2749	29497	2497	67249	7496	67429	538
385	67429	2947	583	6492	2496	2949	62479	385	2947
2497	385	2496	29472	94764	2624	7937	5292	2416	385
385	2947	64279	2497	583	6492	2496	67249	538	64239
385	2974	67249	2946	2942	2947	6492	6429	6429	2497
92476	2947	583	2497	385	62479	6479	385	2416	67429
62479	583	385	67429	358	6492	62479	2947	385	2749
6492	2496	583	2497	67249	2947	583	2497	9276	2496
6429	64279	2749	2496	385	62479	2949	6492	385	2497
2496	2949	583	6492	2946	2974	2497	385	67429	6279
92476	385	2497	6492	67249	2496	2947	385	92467	583
6492	2497	67429	2949	2492	583	2497	9476	2946	2496
2496	2749	2947	64279	62492	385	2496	385	2497	385
2497	67249	6492	2496	2749	2949	538	2497	583	9476
6942	853	46279	2497	62476	385	2496	2497	92476	538
2947	6492	67429	2497	29476	2497	62479	62476	6942	

Figure 1. Bourdon-Anfimov Test Form

2) Service Accuracy Test:

- Purpose: To measure the accuracy of service strokes in tennis.
- Procedures: The tennis court is marked according to Figure (1). A rope is fixed on the net posts parallel to and above the net, with a distance of (4) feet between it and the net, and a height of (7) feet from the ground. It must be tightly stretched and perfectly parallel to the net.
- Scoring Zones: The numbers (1, 2, 3, 4, 5, 6) are values indicating zones with the following dimensions:
 - Number (1): A rectangle measuring (15 × 13.5) feet.
 - Number (2): A rectangle measuring (6 × 10.5) feet.
 - Numbers (3, 4, 5, 6): Rectangles each measuring (1.5 × 3) feet.
- The same numbers (1, 2, 3, 4, 5, 6) indicate the scores allocated for each zone where the ball lands.
- Execution: Before the test, a warm-up of no less than (10) minutes is conducted. The student stands behind the baseline and serves ten consecutive balls at the specified targets in the opposite half of the court, provided all balls pass between the net and the rope. The student attempts to get the highest score by landing the ball in zone number (6).
- Scoring Calculation:
 - Balls touching the net or rope are not counted as an attempt and are repeated.
 - Balls passing above the rope count as an attempt but receive a score of zero.
 - Each valid ball receives the score of the zone where it lands.
 - The student's score is the sum of points obtained in ten attempts. Maximum score: 60) (Minimum score: 0.

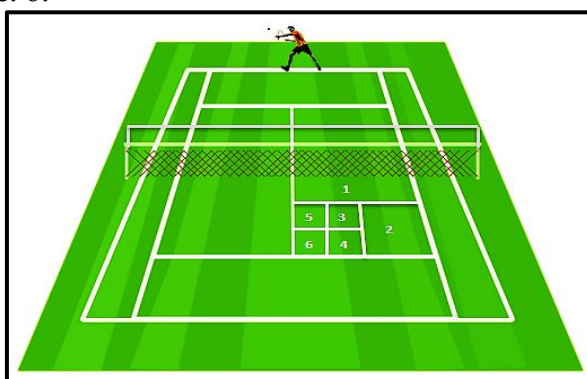


Figure 2. Service Accuracy Test Diagram

3) Forehand and Backhand Groundstrokes Test:

- Purpose: To measure the accuracy of forehand and backhand groundstrokes.
- Tools: 10 tennis rackets, 30 tennis balls, regulation court, basket, tape measure, score sheet, chalk.
- Setup: A rope is fixed to two poles on the net posts, parallel to the net, at a height of (7) feet from the ground and (4) feet from the net. Three parallel lines are drawn between the service line and the baseline, spaced (4.5) feet apart.

- Execution: The examinee stands on the center mark on the baseline. They are given five trial attempts. The student attempts to return the ball fed by the teacher using the forehand or backhand stroke. Ten attempts are allocated for the forehand and ten for the backhand.
- Scoring: The score is the sum of points from ten attempts. The ball must cross the net and go under the rope. Scores are progressive from (1-5).
 - Maximum score for Forehand: 50.
 - Maximum score for Backhand: 50.
 - Minimum score: 0.
 - If the ball passes over the rope, it receives half the score of the zone where it lands.
 - If it lands outside the zones, the score is zero.

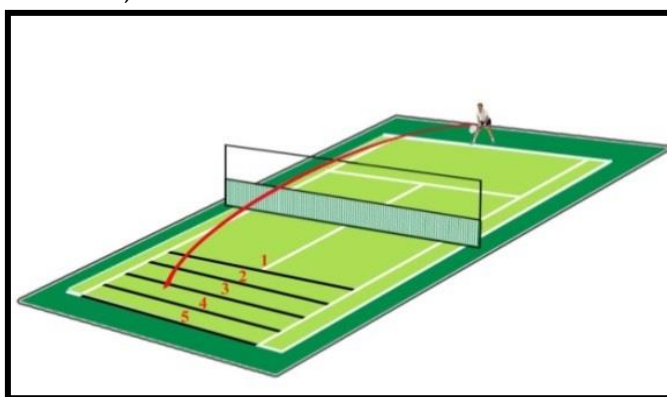


Figure 3. Groundstrokes Test Diagram

Determination of Basic Tennis Skills and Their Tests:

The basic skills identified were (Service – Forehand Groundstroke – Backhand Groundstroke), which are part of the tennis curriculum for the third stage. Regarding the tests, the researchers relied on performance accuracy tests that are standardized and applied to samples similar to the current research sample.

5) Pilot Study:

A pilot study for the scale and skill tests was conducted on a sample of (8) students selected randomly from outside the main research sample on Sunday, 2/2/2024, at 10:00 AM on the outdoor tennis courts. The purpose was to:

1. Identify difficulties facing researchers during test execution.
2. Ensure clarity of how to answer the scale.
3. Ensure the assistant team understands the research procedures.
4. Check the suitability of skill tests for the sample.
5. Verify the validity of devices and tools.
6. Establish the scientific foundations of the tests.

Scientific Foundations of Tests:

- First: Validity: The researchers established validity using Face Validity by consulting experts and specialists through a questionnaire and personal interviews to ensure the tests measure what they were designed for.

- Second: Reliability: The test was re-applied on the same sample after seven days (Test-Retest method). Using Pearson correlation coefficient, results showed high reliability: Service (0.90), Forehand (0.92), Backhand (0.88).
- Third: Objectivity: Using Pearson correlation coefficient to check inter-rater reliability, results showed high objectivity.

6) Main Procedures:

1. Pre-tests:

Pre-tests for attention intensity and the accuracy of the three basic skills were conducted on Monday, 10/2/2024, at 10:00 AM for both groups.

Equivalence of the Research Sample:

To control the experimental variable, researchers ensured equivalence between the control and experimental groups using the t-test for independent samples. Results showed that calculated t-values were smaller than the tabulated t-value for all tests, indicating no significant differences and that both groups started from the same baseline (Table 1).

Table 1. shows the arithmetic means, standard deviations, calculated t-value, significance (Sig), and indication of differences between the control and experimental groups in the pre-tests.

No.	Variable	Unit	Experimental (Mean)	Experimental (SD)	Control (Mean)	Control (SD)	Mean Diff	Std. Error Diff	Calc. t-value	Sig	Indication
1	Attention Intensity	Degree	6.01	1.93	6.12	1.86	0.16	0.73	1.03	0.421	Non-Sig
2	Service	Degree	11.80	1.90	11.47	2.20	-0.33	2.06	-0.62	0.539	Non-Sig
3	Forehand	Degree	14.13	1.51	14.27	2.34	0.14	1.96	0.26	0.794	Non-Sig
4	Backhand	Degree	10.47	1.77	10.20	2.21	-0.27	2.00	-0.52	0.608	Non-Sig

Tabulated t-value = (2.05) at degrees of freedom 15+15-2 = (28) and significance level 0.05.

2. Main Research Experiment:

The educational units for the (REACT) strategy were implemented starting Monday, 17/2/2024, until 14/4/2024. The total number of educational units was (9), with one unit per week lasting (90) minutes. Each basic skill was allocated (3) units. The strategy was applied to the main part of the lesson (educational and practical components) for the experimental group as follows:

1. Relating: The teacher asks students about the first skill a player performs and links it to gameplay and its importance in a match.
2. Experiencing: Students begin trying the skill freely) (the teacher observes errors and demonstrates the model.
3. Applying: Drills are organized, and students attempt the skill individually or in pairs, identifying target areas for accuracy.

4. Cooperating: Students are divided into small groups. Each group competes to perform the skill correctly, encouraging teamwork and competition.
5. Transferring: A game is played between two students using the skill. The teacher asks how mastering the skill helps defeat the opponent.

The control group used the traditional method followed by the subject teacher.

3. Post-tests:

Post-tests were conducted on Monday, 21/4/2024, at 10:00 AM for both groups under controlled conditions similar to the pre-tests.

7) Statistical Means:

The researchers used the Statistical Package for the Social Sciences (SPSS) (Abdullateef Abduljabbar et al, 2025) (Fayyad et al, 2025) (Hammood et al, 2024).

Results and Discussion

Presentation of Results

1. Results of Pre- and Post-tests for the Experimental Group:

Table 2. Shows means, standard deviations, mean difference, standard error of difference, t-value, and Sig for the Experimental Group.

No.	Variable	Unit	Pre (Mean)	Pre (SD)	Post (Mean)	Post (SD)	Mean Diff	Std. Error Diff	Calc. t-value	Sig	Indication
1	Attention Intensity	Degree	6.01	1.93	12.30	3.16	6.29	2.09	11.38	0.000	Sig
2	Service	Degree	11.47	2.20	30.27	3.10	18.80	2.30	31.63	0.000	Sig
3	Forehand	Degree	14.27	2.34	31.67	2.69	17.40	2.23	30.21	0.000	Sig
4	Backhand	Degree	10.20	2.21	20.87	3.07	10.67	2.02	20.45	0.000	Sig

Tabulated t-value = (2.14) at df (14) and sig level (0.05).

2. Results of Pre- and Post-tests for the Control Group:

Table 3. shows means, standard deviations, mean difference, standard error of difference, t-value, and Sig for the Control Group.

No.	Variable	Unit	Pre (Mean)	Pre (SD)	Post (Mean)	Post (SD)	Mean Diff	Std. Error Diff	Calc. t-value	Sig	Indication
1	Attention Intensity	Degree	6.12	1.86	9.29	2.05	3.17	1.88	6.29	0.000	Sig
2	Service	Degree	11.80	1.90	28.20	3.03	16.40	2.38	26.67	0.000	Sig
3	Forehand	Degree	14.13	1.51	29.07	2.40	14.93	2.05	28.20	0.000	Sig

No.	Variable	Unit	Pre (Mean)	Pre (SD)	Post (Mean)	Post (SD)	Mean Diff	Std. Error Diff	Calc. t-value	Sig	Indication
4	Backhand	Degree	10.47	1.77	18.80	1.78	8.33	1.50	21.47	0.000	Sig

Tabulated t-value = (2.14) at df (14) and sig level (0.05).

3. Results of Post-tests for Control vs. Experimental Groups:

Table 4. Shows means, standard deviations, mean difference, standard error of difference, t-value, and Sig between Control and Experimental Groups in Post-tests.

No	Variable	Unit	Control Post (Mean)	Control Post (SD)	Exp. Post (Mean)	Exp. Post (SD)	Mean Diff	Std. Error Diff	Calc. t-value	Sig	Indication
1	Attention Intensity	Degree	9.29	2.05	12.30	3.16	3.01	2.01	4.51	0.004	Sig
2	Service	Degree	28.20	3.03	30.27	3.10	2.07	3.07	2.61	0.016	Sig
3	Forehand	Degree	29.07	2.40	31.67	2.69	2.60	2.55	3.95	0.001	Sig
4	Backhand	Degree	18.80	1.78	20.87	3.07	2.07	2.53	3.16	0.005	Sig

Tabulated t-value = (2.05) at df (28) and sig level (0.05).

Discussion

Table (2) shows the progress achieved by the experimental group which applied the (REACT) strategy, emphasizing aspects related to skill, particularly the mental aspect. Learning any motor skill involves a mental component, and attention intensity plays an effective role in learning tennis skills, as they are closed skills or skills played in specific locations. Therefore, the (REACT) strategy acts as a new educational environment due to the motivation, excitement, and curiosity it adds for students, encouraging them to link its components. Additionally, giving the learner an active and energetic role through discovery, inquiry, and experimentation via daily tasks constitutes positive practices that contribute to building mental aspects and acquiring performance details more accurately. This contributes to increasing the effectiveness of learning basic tennis skills. This was confirmed by (Nushi, 2021), stating that the (REACT) strategy contributes to improving the level of scientific sense by improving areas of education, as well as improving mental and emotional aspects such as curiosity, exploration, experimentation, and perseverance in learning and performance during educational units.

The researchers point out that the first stage in any educational program is properly preparing the learner psychologically and mentally, highlighting the mental aspect and its importance in the learning process and the most effective methods for skill performance. This is done by mentally drawing initial coordinates in the motor program regarding the skill to be taught. (Hummadi et al, 2025) mention that "many errors committed during performance are not caused by deficiencies in the physical or motor aspect or lack of applied practice, but rather by a lack of mental skill and focus in learning that skill".

From Table (3), regarding the control group, it is evident that all results were significant in favor of the post-tests. The researchers attribute this significance to the effective role of the subject teachers and the style used in presenting and explaining the skill, as well as the use of guidance regarding motor performance and repetition by learners. This led to the physical, psychological, mental, and motor development and activation of the group members, creating motivation to continue learning. (Hammood et al, 2024) confirms "the stronger the motive in the learner, the stronger their desire towards the activity leading to learning." This motivated the group members to practice, continue performance, repeat exercises, and receive information, which assisted them in learning and had a direct role and impact on learning the basic tennis skills under research, because repetition is one of the most important principles of learning. (Awadh et al, 2025) also confirmed that practice and exerting effort through training and continuous repetition are essential in the learning process.

From Table (4), which shows the superiority of the experimental group over the control group in all dependent variables, the researchers attribute this superiority to the use of the REACT strategy within small groups. It provided students with the ability to Relate, Experience, Apply, and Cooperate. The sequence of work and performance within this strategy leads to the development of mental aspects, attention, and focus on performance. The use of the REACT strategy ensures continuous interaction between what is observed and what is performed, deriving concepts, principles, and theories that contribute to understanding the application of the skill. The applied strategy works as an educational tool clarifying the interaction between students in the conceptual aspect (explaining the skill) and the practical aspect (applying the skill) (Nushi, 2021). Furthermore, knowing modern and appropriate strategies helps teachers choose the best ones that suit the learners' level. Planning according to teaching styles greatly helps the teacher in selecting the strategy, method, and style preferred by learners and helps discover individual differences among them, achieving maximum learning outcomes with minimum time and effort (A. H. Ali & Mania, 2019).

Conclusions

1. The (REACT) strategy has a positive and effective role on attention intensity and the learning of basic tennis skills for students of the experimental group.
2. The traditional style has a positive role on attention intensity and the learning of basic tennis skills for students of the control group.
3. The experimental group, which applied the (REACT) strategy, outperformed the control group, which applied the traditional style, in attention intensity and the learning of basic tennis skills.

Recommendations

1. Necessity of adopting the (REACT) strategy in tennis educational units due to its effectiveness in increasing students' learning motivation.
2. Necessity of diversifying the learning strategies used in teaching basic tennis skills.
3. Emphasize attention to teaching strategies and enrolling subject teachers in development courses regarding modern strategies and their application in educational units.
4. Emphasize conducting further studies on tennis skills and other skills in other sports activities and for different samples of both genders.

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Appendix (1)

Names of Experts and Specialists Consulted by the Researchers

No.	Expert Name	Academic Title	Specialization	Workplace
1	Khalil Ibrahim Suleiman	Professor	Motor Learning	Univ. of Anbar - College of PE & Sports Sciences
2	Mazen Abdul Hadi Ahmed	Professor	Motor Learning	Univ. of Babylon - College of PE & Sports Sciences
3	Waleed Waadullah Ali	Professor	Teaching Methods / Tennis	Univ. of Mosul - College of PE & Sports Sciences
4	Nada Nabhan Ismail	Professor	Test & Measurement / Tennis	Univ. of Baghdad - College of PE & Sports Sciences
5	Majid Khalil Khamis	Professor	Motor Learning / Tennis	Univ. of Diyala - College of PE & Sports Sciences
6	Ammar Jabbar Abbas	Professor	Motor Learning / Tennis	Univ. of Diyala - College of PE & Sports Sciences
7	Maher Mohammed Ismail	Assist. Prof.	Sports Management / Tennis	Al-Mustansiriya Univ. - College of PE & Sports Sciences
8	Nasr Khalid Abdul Razzaq	Assist. Prof.	Teaching Methods	Univ. of Anbar - College of PE & Sports Sciences