THE EFFECT OF THE SCHMECK MODEL ON DEVELOPING AGILITY AND LEARNING THE OVERHEAD SETTING SKILL IN VOLLEYBALL

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ABSTRACT

Background. Learning, in its fundamental concept, relies on the individual's capability, readiness, and the amount of time needed by the learner. The learner represents the core of the educational process, and the primary objective of this process is to enhance the learner's physical and skill-related abilities. **Objectives.** The study aimed to identify the effect of the Schmeck model on developing agility and learning the overhead setting skill in volleyball for both the experimental and control groups, as well as to determine the superiority of the Schmeck model in enhancing agility and learning the overhead setting skill between the two groups. **Method**. The experimental method was employed using the design of equivalent groups, as it was deemed suitable for addressing the research problem. The research population consisted of second-year students at the College of Physical Education, with a total of (206) students. A random selection method was used to ensure that each individual had an equal chance of being chosen for either group. The experimental group received instructional units based on the Schmeck model, while the control group followed the curriculum adopted by the course instructor. The instructional program consisted of (8) teaching units delivered at a rate of two sessions per week. The researchers utilized the Statistical Package for the Social Sciences (SPSS) to process and analyze the data. **Results.** The most significant conclusions reached by the researchers were that the Schmeck model achieved a notable improvement in developing agility and a clear advancement in the technical performance of the overhead setting skill in volleyball for both the experimental and control groups. **Conclusion.** Furthermore, the experimental group outperformed the control group in the post-tests. The recommendations emphasized the necessity of adopting the Schmeck model, as it contributes to enhancing agility and developing the technical performance of the overhead setting skill. Additionally, the study recommended conducting similar research addressing the Schmeck model in relation to other volleyball skills.

Keywords; schmeck model, agility development, overhead setting skill, volleyball, experimental group

A. INTRODUCTION

Learning, in its fundamental concept, relies on the individual's capability, readiness, and the amount of time needed by the learner. The learner represents the core of the educational process, and the primary objective of this process is to enhance the learner's physical and skill-related abilities (Ebrahim & Hussein, 2025; Hardinata et al., 2023; Hussein, 2025; Zulnadila et al., 2025). Achieving this requires comprehensive attention to providing diverse educational situations that support the learning process and offer opportunities to achieve optimal performance. This is especially true in volleyball, where skill mastery reveals the learner's ability to understand the components and sequences of movements and techniques (BOYANMIS & Akin, 2021; Ogloblin & Podoplelov, 2011).

Learning is essentially a means of saving time, which is why one of the objectives of modern teaching methods and technologies is to move beyond traditional levels. There are various methods for teaching motor skills, with varying degrees of success across different levels (Maciasz et al., 2020; Saputra et al., 2021). However, many outdated methods are still in use. For this reason, researchers continue to seek new methods and approaches to advance motor task performance. Here, the effectiveness of instructional units based on the Schmeck Model emerges. This model focuses on developing motor and physical abilities by processing information, breaking down skills into sequential elements, organizing ideas, and then training students to learn, analyze, recall, and recognize errors in technical performance. This is followed by correcting these errors to ensure proper skill execution (Harvey & Jarrett, 2014; McWeeny et al., 2020).

Agility is one of the essential motor abilities that play a crucial role in improving physical and athletic performance (Taher et al., 2021). It relates to an individual's ability to change direction quickly and efficiently while maintaining balance and motor control. From this perspective, the importance of utilizing modern educational and training models to develop this attribute becomes evident. Among the most prominent of these models is the Schmeck Model, which relies on active learning and the learner's effective participation in building their knowledge and skills. This model follows systematic steps emphasizing critical thinking, inquiry, and problem-solving, contributing to both physical and cognitive development. Therefore, applying the Schmeck Model in educational or training settings can have a tangible positive impact on enhancing agility and improving general motor performance.

Volleyball is a sport where learning takes place in accordance with the principles of motor learning. Its skills vary in difficulty and complexity, and they are fundamentally interdependent, as performing any skill relies on the proper execution of another. The setting skill in volleyball involves preparing suitable balls for attackers in different positions, enabling them to carry out effective offensive strikes to break through the opponent's defense. The objective of this skill is to initiate an ideal attack against the opposing team, executed from various body positions, by accurately delivering the ball to the correct spot after receiving it from a serve, a spike, or a pass. The ball's direction is then altered to reach the spiker, who sends it as a powerful attacking strike into the opponent's court.

Volleyball is one of the team sports whose success depends on students mastering the basic skills. Learning these skills relies on the learner's effort and requires the instructor to

select an appropriate teaching method that aligns with both the learner's capabilities and the type of skill being taught. Through their review of the field and observations in volleyball, the researchers noted fluctuations in students' performance of the setting skill. Therefore, they see it necessary to highlight an instructional model comprising educational units — namely, the Schmeck Model — to develop agility and examine its effect on the study sample. The aim is to bridge theoretical knowledge with practical application, introducing a change in performance by developing instructional units based on the Schmeck Model to improve agility and the setting skill in volleyball for students, thereby moving away from conventional approaches and adopting modern techniques.

Research Objectives

1. To identify the effect of the Schmeck Model on developing agility and learning the setting skill in volleyball for both the control and experimental groups.
2. To determine the superiority of the Schmeck Model in enhancing agility and learning the setting skill in volleyball between the control and experimental groups.

B. METHOD

Research Method

Researchers must select an appropriate method to address a given research problem, as “a method is the path that leads to uncovering the truth in sciences to reach a specific conclusion” (1). Accordingly, the researchers employed the experimental method using the equivalent-groups design, as it aligns with the nature of the research problem.

Research Population and Sample

The research population consisted of second-year students at the College of Physical Education and Sports Sciences / University of Wasit for the academic year (2024-2025), totaling 206 students. A random sampling method was used to select the research sample, ensuring that each individual had an equal chance of being chosen to be part of either group (2). The sample included 24 students, with the researchers selecting two sections out of five by drawing lots. Female student sections were excluded, as the research was limited to male students only. Additionally, students practicing volleyball competitively and those involved in the first and second pilot studies were also excluded.

Section (C) was designated as the control group, consisting of 12 students, while section (E) represented the experimental group, also comprising 12 students. This resulted in a research sample representing 20.5% of the total population — a percentage considered appropriate for providing a truthful and valid representation of the research population.

Methods of Data Collection

The researchers relied on the following tools for data collection:

- Arabic and foreign sources and references.
- Observation.
- Tests and measurements.
- Test result recording forms.

- Personal interviews.
- Questionnaire.

Instruments and Devices

- Official volleyball court.
- Official volleyballs.
- 12 training shirts.
- 2 whistles (Akma brand).
- Cones.
- 2 handheld stopwatches.
- 2 scientific handheld calculators (Sharp brand).
- Medical device for measuring weight and height.
- Video recording camera (Sony brand).
- Laptop computer (Acer brand).
- CDs.

Determining the Motor Abilities

After receiving academic consultation from the esteemed Head and members of the Scientific Committee for approving the research title, as well as from the supervisor and through several personal interviews with experts and specialists in the fields of tests and measurement, motor learning, and volleyball, the researchers selected specific motor abilities related to the volleyball setting skill. The identified ability was agility.

Determining Motor Ability Tests

In line with the research objectives, and after reviewing relevant sources and scientific studies concerning motor ability tests, the researcher prepared a questionnaire which was presented to a group of experts and specialists in the fields of tests, measurement, motor learning, and volleyball to obtain their opinions regarding the selection of appropriate agility tests. The expert panel consisted of 5 specialists. The results of the questionnaire were analyzed using the relative importance equation. After data sorting, the agility test that achieved the highest agreement, surpassing the accepted relative importance score of 7, was adopted.

Description of the Agility Test

First: Agility Test

- Test Name: 9-3-6-3-9 Shuttle Run Test.
- Test Objective: To measure specific agility.
- Required Equipment:

a) Official volleyball court
b) Stopwatch (1)
c) Test result recording form

Performance Description The subject stands behind the starting line of the court. At the auditory signal, the subject runs in a straight line to touch the middle line at 9 meters with the right hand, then turns back to the 3-meter line, then runs to the 6-meter mark on the other half of the court, then returns to the 3-meter line, touching it again with the right hand, and finally runs to the finish line at 9 meters, crossing it with both feet. It is essential that the lines are touched with the right hand each time and that the final line is crossed with both feet. Scoring: The time is recorded from the start until crossing the finish line.

Selection of Volleyball Skill Tests

A test is a means of measuring an individual's ability to perform a specific task under precise scientific conditions to ensure accurate results. Tests are essential in scientific research across educational, psychological, and sports fields.

The researchers selected a standardized test previously used in numerous studies within the Iraqi environment for volleyball and on similar samples. The test's validity, reliability, and relevance to the skills under investigation have been established. The technical performance test (technique) for the volleyball setting skill was chosen in agreement with the supervisor, given his extensive expertise in this area. The test evaluates the apparent structure of the skill through three main sections:

- Preparatory Phase
- Main Phase
- Final Phase

Technical Performance Test for the Setting Skill

1. Objective: To assess the technical performance (technique) of the setting skill through its three phases (preparatory, main, final).
2. Equipment: Official volleyball court, 3 volleyballs, pre-prepared evaluation form, video camera.
3. Performance Method: Each player performs the setting skill from position (3) for three consecutive trials, attempting to execute the skill correctly without the ball or the player contacting the net or crossing to the opponent's court.
4. Scoring: Three evaluators assess the three trials for each participant. Each evaluator gives a score out of 10 points per trial, divided as follows:
5. 3 points for the preparatory phase.
6. 5 points for the main phase.
7. 2 points for the final phase.

The best score from each evaluator is selected. The final score for each participant is the arithmetic mean of the three best scores.

Pilot Study

The researchers conducted a pilot study to control study variables, identify operational obstacles, and test both the agility and technical performance tests on a separate sample of

12 second-year students from the College of Physical Education and Sports Sciences - University of Wasit, with the assistance of a supporting work team, on Monday, 23/9/2024.

The pilot study aimed to

1. Verify the suitability of the tests for the research sample.
2. Determine the time required to perform the tests.
3. Identify challenges in the work procedures and devise appropriate solutions.
4. Test the adequacy of the equipment used.
5. Train and prepare the supporting work team.
6. Calculate the scientific bases of the tests.

Validity of the Tests

To establish the validity of the motor and skill tests, the researchers prepared a specific questionnaire concerning the agility tests. It was presented to a panel of experts and specialists in the fields of tests and measurement, motor learning, and volleyball to judge the appropriateness of the agility tests. The skill tests were selected based on the supervisor's expertise and the experts' feedback.

Reliability of the Tests

Reliability refers to a test's ability to yield approximately the same results if reapplied to the same group of individuals. The researchers applied the selected motor and skill tests to a sample of 12 students on Monday, 23/9/2024 at 10:00 a.m. on the volleyball court of the College of Physical Education and Sports Sciences - University of Wasit. The tests were reapplied after seven days, on Sunday, 29/9/2024.

The researchers then calculated the correlation between the two sets of scores using the Pearson correlation coefficient, which showed strong relationships in all tests. The correlation coefficients between the first and second test scores are presented in Table (1).

Table 1. Correlation coefficients between the first and second test scores Test

Correlation coefficients between the first and second test scores Test	Calculated value	Tabular value	sig	Significance of correlation
Agility	0.73	0.602	0.05	Sig
Preparation	0.71		Sig	

Table 2. Differences between the pre-test and post-test results for the control group participants regarding the study variables (agility and setting) Variables Unit of measurement control experimental

the study variables (agility and setting) Variables	Unit of measurement	control	experimental	sig	Significance of correlation
Arithmetic Mean		Standard Deviation	Arithmetic Mean	Standard Deviation	
Agility	Sec	11.07 0.91	10.45 0.80	0.654	No sig

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Preparation	degree	3.62	0.78	7.10	1.07	0.001	sig

differences between the pre- and post-tests, in favor of the post-test.

C. RESULTS AND DISCUSSION

Through the previous tables (3, 4, and 5), it is evident that there are statistically significant differences between the control and experimental groups in the agility test, in favor of the experimental group. The results indicated that the specialized exercises contributed to improving agility, as they require an integrated interaction between speed, strength, and flexibility — which positively impacts the coordination and smooth execution of movements. Accordingly, it becomes clear that agility exercises enhance key motor qualities.

The setter's ability to quickly and accurately change the body's position or direction, in order to reach the ball at the appropriate time and perform the setting action in a balanced, targeted manner toward the attacking player — despite the dynamic changes within the court situation. The proper, scientific, and systematic employment of such exercises contributes to achieving integrated development in essential motor abilities (Hasibuan & Imran Akhmad, 2022; Mroczek et al., 2018).

The specialized exercises were characterized by their comprehensive inclusion of both physical and skill-related preparation components, aligned with the research sample's level and individual capabilities. These exercises were based on the principle of gradual learning, which helped enhance the learning processes, develop skill performance, and improve technical accuracy. This aligns with what educational literature suggests — that achieving learning requires repetition and practical exercise of the task, as motor practice is considered the most influential variable in the motor learning process (Halim et al., 2019; Purnomo & Hariono, 2020; Zhang, 2022).

Moreover, the careful selection of exercise types allowed for free, agile, and smooth movement among members of the experimental group. It also helped create a stimulating educational environment marked by excitement and engagement, free from monotony or fatigue during performance. This is consistent with the notion that: Movement improves through regular sports training as a result of the development of mental, cognitive, physical, and motor attributes, alongside the increase in stored motor experiences in the brain. Setting in volleyball is considered a form of passing, but one requiring greater accuracy because the ball must travel through a specific trajectory in the air, as it is directly connected to the offensive spike (Catikkas et al., 2013).

D. CONCLUSION AND RECOMMENDATIONS

The Shamk model achieved a noticeable improvement in cognitive achievement and motor abilities in volleyball for both the control and experimental groups. The Shamk model clearly developed the technical performance of the overhead front setting skill in volleyball for both groups. The experimental group outperformed in the post-tests regarding the development of volleyball-related motor abilities. There was an advantage for the

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experimental group in the post-tests for the technical performance of the overhead front setting skill in volleyball. It is essential to employ the Schmeck model, as it supports the enhancement of cognitive achievement, motor abilities, and the development of the technical performance of the overhead front setting skill. It is necessary to use specialized exercises to develop motor abilities. It is essential to employ specialized exercises for enhancing the technical performance of the overhead front setting skill. Similar research studies should be conducted to investigate the Shamk model with other volleyball skills.

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F. AUTHOR CONTRIBUTION STATEMENT

All authors are responsible for the completed manuscript.

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