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Practical Demonstration Strategy and Motor Coordination in Volleyball Skills: Strategi Demonstrasi Praktis dan Koordinasi Motorik dalam Keterampilan Bola Voli

Rouaa Abdullah Sakhi Ministry of Education/General Directorate of Education Baghdad - First Rusafa/Iraq

Background: Teaching volleyball effectively requires strategies that integrate visual, motor, and cognitive engagement. Specific Background: Practical demonstration enables learners to connect observation with movement, promoting better psychomotor learning outcomes. Knowledge Gap: Few studies have examined how demonstration-based strategies improve both coordination and technical serving skills among students. Aims: This study aimed to determine the effectiveness of the practical demonstration strategy in developing motor coordination and serving skills in volleyball. Results: Findings revealed significant improvements in coordination and serving accuracy for students exposed to the demonstration strategy compared with the control group. Novelty: The study introduces an integrated visual–motor approach in volleyball education. Implications: The results highlight that combining visual modeling with physical execution enhances learning efficiency and can be applied across various physical education settings.

Highlights:

- Practical demonstration improves motor coordination and serving performance.
- Visual–motor learning enhances psychomotor skill development.
- The strategy supports modern constructivist approaches in sports education.

Keywords: Practical Demonstration, Motor Coordination, Volleyball, Serving Skills, Physical Education

Introduction

One of the indicators of development in the process of learning various motor skills is the adoption and selection of appropriate learning strategies, methods, and teaching aids. In this context, learning strategies have emerged, including the practical demonstration strategy, one of the educational systems that emphasizes the dynamism, movement, and interaction of learners in educational situations. Educational activities and materials are presented according to the learners' capabilities and readiness, as well as their previous cognitive background. Educational supports aim to satisfy learners' needs and increase their motivation for learning, thus enhancing their experience and developing their skills and abilities. The concept of practical demonstrations is based on providing the temporary assistance the learner needs. This assistance may take the form of hints or guidance information intended to equip the learner with certain skills and abilities that enable them to continue their learning. Afterwards, the learner is left to complete the remainder based on their own abilities, relying on their own learning. In discovering new concepts and knowledge.[1]

The practical presentation strategy is one of the applications of modern theory. It aims to enable the learner to connect their previous knowledge with the new educational situation, train them to properly evaluate ideas, and utilize their available means and tools to achieve new results that add to the learner's experience. Furthermore, it helps them to address and deal with situations, and also enhances independence and self-reliance during learning.[2]

One of the sports that requires the practical presentation strategy is volleyball, as it relies on a planning and educational system during skill performance, as it affects the learner's or player's ability or efficiency in performing basic skill requirements.

Research Problem:

Through her work, follow-up, and observations of the volleyball instructional sessions, the researcher identified a noticeable weakness in students' comprehension of the subject. This deficiency appears to stem from the reliance of instructors on traditional teaching methods that emphasize rote instruction and memorization. Such approaches fail to engage students, as they are neither aligned with the learners' characteristics nor with the practical nature of the material being taught. Moreover, these methods overlook individual differences and provide little connection to real-life applications. Given that students differ in their modes of thinking and in the pace at which they acquire knowledge, it is essential to employ a teaching strategy that facilitates understanding of the content and aligns with their cognitive abilities and learning styles. The practical presentation strategy is appropriate for the students' needs in understanding the information provided, due to the variety of presentation methods. It can be live and direct, making it easy to apply and reflect on realistically, or indirect, through graphics or video. The use of the educational support strategy is appropriate for the topics of learning volleyball skills, especially in the practical aspects. This strategy adds a kind of motivation to them in taking in the information and absorbing it in a way that motivates them and encourages them to acquire knowledge. It helps them connect it to their real lives and demonstrate it in their morals with others, since volleyball is a cooperative group game.

Research Objective:

- To determine which method— the practical demonstration strategy or the conventional teacher-directed approach—has a greater impact on improving motor coordination and the overhand (tennis) serve skill in volleyball among students.

Research Hypothesis:

- There are statistically significant differences in the development of motor coordination and the overhand (tennis) serve skill in volleyball between the pre-test and post-test results, with the post-test scores showing improvement in favor of the practical demonstration strategy.

Research Areas:

- Human Area: Third-year volleyball students for the academic year 2022-2023.
- Temporal Area: From December 11, 2022 to February 22, 2023.
- Spatial Area: The playground of the College of Physical Education and Sports Sciences, University of Kufa.

Method

Research Methodology:
"The researcher followed the experimental method by designing two equivalent groups with pre-test and post-test to suit the nature of the problem to be solved."

Research Community and Sample:

1. Research Community and Sample:

The research community was determined as "third-year students from the College of Physical Education and Sports Sciences at the University of Kufa for the academic year 2022-2023, numbering (43) students. The research sample was selected using a simple random method, totaling (16)

students. They were divided by lottery into two groups, (8) students each," to meet the research requirements. The researcher excluded a group of students representing the following:

Table 1. Research Community and Sample, Excluded Players, and Their Percentages

Variables		**number**	**percentage**
Research Community		43	100%
Research Sample		16	37.21%
The excluded	Exploratory Sample	10	23.26%
	Failure	4	9.30%
	Injury and Absence	13	30.23%

Research Procedures:

1. Determining Research Variables: The researcher presented standardized tests to measure motor coordination, the skill of overhand serve (tennis), and volleyball accuracy, "which is one of the skills of the volleyball curriculum for third-year students at the College of Physical Education and Sports Sciences at the University of Kufa, in a questionnaire form to a committee of experts and specialists." After collecting the data, the data was transcribed and the percentage for each test was determined. The percentage was 100% for all tests. Tests that had been applied in previous studies and research on samples that matched the specifications of the current research sample were adopted.

2. Research Tools and Aid:[3]

Arabic Sources and References - Data Collection Form - Questionnaire - Dell Computer (8) - Legal Volleyball Court - Measuring Tape - Medical Scale (1) – Whistle

3. Exploratory Experiment for the Tests Used in the Research:[4]

In order for the researcher to reach objective results, she must conduct an exploratory experiment that explores several indicators that serve to achieve the research objectives. Therefore, the researcher conducted an exploratory experiment to test the skills under study on a sample of (10) third-year students from the College of Physical Education and Sports Sciences/University of Kufa on Wednesday, December 14, 2022.

Main Experiment

1. **Pretests:**

The researcher conducted pretests on the two research groups (control and experimental) regarding the research variables (motor coordination, overhand serve skill (tennis), and accuracy) in volleyball on Wednesday, December 21, 2022, at nine o'clock in the morning, in the indoor hall of the College of Physical Education and Sports Sciences, University of Kufa.

2. **Homogeneity of the Research Sample:**

"The researcher verified the homogeneity of the research sample, which numbered (8) students, regarding the variables related to anthropometric measurements, namely (height, body mass, and chronological age)."

Table 2. shows the homogeneity of the research sample

Variables	**Units**	**Mean**	**Median**	**SD**	**Mode**	**Skewness**
Height	Cm	175.75	175	1.87	171	0.399
Body Mass	Kg	73.81	74	2.28	72	0.245
Chronological Age	Months	20.75	20.5	1.24	20	0.604

"The results of Table 2 show that the values of the skewness coefficient are less than (±1), indicating the homogeneity of the research sample (control group) in the variables (height, body mass, chronological age)."

3. **Equivalence of the two research groups:** Before beginning to implement the components of the practical presentation strategy, the researcher resorted to conducting an equivalence process for the two research groups in the variables related to the skill tests.

Table 3. shows the equivalence of the two research groups

Variables	**Control group**		**Experimental group**		**(t) value**	**Indicators**
	Mean	**SD**	**Mean**	**SD**		
Motor coordination/score	8.230	1.036	9.016	0.327	Motor coordination/score	8.230
Technical performance of the serve (tennis)/score	7.79	1.44	3.35	1.483	Technical performance of the serve (tennis)/score	7.79
Serve accuracy (tennis)/score	2.83	0.87	3.32	0.448	Serve accuracy (tennis)/score	2.83

4. Steps of the Practical Presentation Strategy: [5]

When conducting a presentation, the teacher must take steps to ensure they are proficient in the work they are doing and to form a correct picture for the students in terms of information and application. This includes the following:

First: The initial presentation: This includes the following:[6]

A- Planning: Like any new lesson, the teaching objectives are analyzed to use the appropriate method according to the objectives and the practical presentation that will be used. Attention must be paid to the allocated time so that the presentation fits within the available time.

B- Preparing the presentation location: Providing the tools the teacher needs to deliver the presentation, preparing the necessary materials, and finding an appropriate location for the presentation that allows everyone to watch.

C- Experimenting before the presentation: This allows the teacher to avoid mistakes that may occur in advance.

D- Preparing the learners: By providing the students with necessary information before the presentation begins, this helps them prepare and understand the topic, enabling them to make the connection between the topic and the presentation presented to them.

Second: During the presentation: The teacher must consider the following steps:[7]

- Inform the learners of the desired objectives of the presentation, regardless of the context. Image.

- Set the expected time for the presentation to achieve the expected results.
- The teacher supervises the presentation and explains any issues that need clarification.
- The teacher manages the educational process during the presentation by controlling and directing the discussion among the students until all students have the correct knowledge.
- Assign students to write notes during the presentation to help them better understand the presentation.

Third: End of the presentation: It is necessary to conduct a review with the students using assessment methods related to the lesson objectives to ensure their understanding of the topic and to ensure that the projectors are turned off. To ensure the success of this strategy, the teacher must consider the factors that contribute to its success.

5. **Implementation of the Main Experiment:** The main experiment was implemented and applied to the experimental group members, according to the following procedures:[8]

1- The duration of the implementation of the main experiment components was (8) weeks.

2- The number of educational units per week was (1) unit.

3- The duration of each educational unit was (90) minutes.

4- The practical presentation strategy was implemented in the second part. The practical part of the educational unit was applied for (30) minutes.

5. The control group followed the method used by the subject teacher for learning the overhand serve (tennis) volleyball skill.

6. The presentation strategy was implemented using the following steps:

A. Training students on accurate and purposeful observation of the practical tools adopted in the educational units, how to diagnose errors they may make during motor performance, and applying the observation stages to each educational tool.

B. Preparing all practical tools for the overhand serve (tennis), including illustrations, drawings, and a live model.

C. Presenting the parts of the overhand serve (tennis) skill to the students with great precision and identifying the specific educational situations that require the presentation of a practical tool.

D. Presenting the practical tool in the appropriate educational situation, giving students feedback on it and linking this to the overhand serve (tennis) skill they wanted to learn.

E. Students performed repetitions of the overhand serve (tennis) skill to confirm learning of the practical presentation strategy.

7. Post-tests:

"Post-tests were conducted after the completion of the implementation. (8) Educational units in a period of (8) weeks, on the same research group, and under the same conditions and circumstances as the pre-tests, as the post-tests were conducted after the implementation of the practical presentation's strategy was completed. The post-tests were conducted on the control and experimental groups, and that was on (Wednesday) corresponding to (2/22/2023), as the researcher took into account the same conditions in which the pre-tests were conducted in terms of the test time."

Statistical Methods:

The researcher used the following SPSS statistical methods from IBM .

Results & Discussion

Result

Presentation, Analysis, and Discussion of Results

- Presentation, Analysis, and Discussion of the Results of the Motor Coordination and Overhand Serve (Tennis) Volleyball Tests for the Control and Experimental Groups:

Table 4. shows the means, standard deviations, and calculated t-values between the pre- and post-tests for Motor Coordination, Overhand Serve (Tennis), and Accuracy in Volleyball (for the Control Group)

Variables	Pre-test		Post-test		(t) value	Type of indication
	Mean	SD	Mean	SD		
Motor coordination/score	8.230	1.036	8.910	1.631	2.398	Sig.
Technical performance of the serve (tennis)/score	7.79	1.44	8.36	0.22	3.187	Sig.
Serve accuracy (tennis)/score	2.83	0.87	5.22	1.36	3.255	Sig.

Table (4) "shows that the calculated t-values between the pre- and post-tests for motor coordination and overhand serve (tennis) in volleyball for the control group were greater than their tabular value of (2.14) at a significance level of (0.05) and a degree of freedom of (14). This indicates significant differences between the pre- and post-tests, in favor of the post-test."

Table 5. shows the means, standard deviations, and calculated t-values between the pre- and post-tests for motor coordination, overhand serve (tennis), and volleyball accuracy (for the experimental group)

Variables	Pre-test		Post-test		(t) value	Type of indication
	Mean	SD	Mean	SD		
Motor coordination/score	9.016	0.327	14.052	0.196	3.402	Sig.
Technical performance of the serve (tennis)/score	3.35	1.483	15.006	1.23	3.728	Sig.
Serve accuracy (tennis)/score	3.32	0.448	14.06	1.24	3.046	Sig.

Table (5) "shows that the calculated (t) values between the pre- and post-tests of motor coordination and serve (tennis) in volleyball for the experimental group are greater than their tabular value of (2.14) at a significance level of (0.05) and a degree of freedom of (14), which indicates the presence of significant differences between the pre- and post-tests in favor of the post-test."

- Presentation, analysis, and discussion of the results of the post-tests of motor coordination and serve (tennis) in volleyball between the control and experimental groups:

Table 6. shows the means, standard deviations, and calculated t-values in the post-tests of motor coordination and serve (tennis) in volleyball between the control and experimental groups

Variables	Control group		Experimental group		(t) value	Type of indication
	Mean	SD	Mean	SD		
Motor coordination/score	8.910	1.631	14.052	0.196	3.640	Sig.
Technical performance of the serve (tennis)/score	8.36	0.22	15.006	1.23	3.446	Sig.
Serve accuracy (tennis)/score	5.22	1.36	14.06	1.24	3.475	Sig.

Table (6) "shows that the calculated (t) values in the post-tests of motor coordination and serve (tennis) in volleyball between the control and experimental groups are greater than their tabular value of (2.05) at a significance level of (0.05) and a degree of freedom of (28), which indicates the presence of significant differences between the control and experimental groups in favor of the experimental group."

Discussion

From the results presented in Tables (4, 5), it is evident that there were significant differences between the pre- and post-tests for both groups in the most important motor coordination tests and the overhand serve (tennis) in volleyball. The researcher attributes these differences between the two groups to the effectiveness of the practical demonstration strategy adopted by the experimental group, which contributed to developing the motor coordination abilities associated with learning the volleyball serve skill. Focusing on a specific response makes students unable to offer new solutions and makes it difficult for them to change their ideas. "A student who is stuck on a specific idea or is rigid in the face of a method is less capable of creativity than a student with flexible thinking who is able to change when necessary." [9]

The researcher "also attributes this result to diversifying the teaching strategy, linking topics to the reality of practical interaction between students, raising questions that require reflection while reinforcing students' answers, linking lesson objectives to the learner's mental, psychological, and social needs, diversifying stimuli, involving students in planning their educational work, exploiting students' basic needs and helping them achieve self-realization, and providing Students are informed of the results of their work immediately upon completion, and lessons are prepared, planned, and delivered appropriately." As for Table (6), which showed significant differences in the post-tests between the two groups, the researcher attributes these differences to the students' (experimental group) commitment to the vocabulary of the educational units using the adopted method, which contributed significantly to developing the most important motor coordination abilities and learning to serve in volleyball. This is because it is a learning method in which the learner is the focus of the educational process, which increases their motivation and desire to learn this skill. It is also capable of overcoming difficulties associated with the type of motor skill, especially in volleyball due to the size of the court, the number of players, and their movements9, in addition to the contribution of the visual learning strategy to learning to serve (tennis), as well as the fact that it provided sufficient time to apply and present information and correct errors, which provided a greater opportunity to practice the skill, as a result of the repetitions performed by the students in the practical part of the main section in each educational unit and their appropriate repetition. This is consistent with what was stated in that "the many repetitions practiced by the learner during practical application help in acquiring learning."[10]

The researcher sees a connection between motor coordination and the capabilities of the motor system and the central nervous system, in which the process of Understanding,[11] comprehending, analyzing, and perceiving movement or motor program. The nervous system is the primary center of coordination because it regulates effort by regulating the force exerted by the muscles to match the desired skill. Motor coordination is also linked to the functioning of internal systems and their ability to organize and coordinate the effort exerted according to the goal by building physical and motor qualities such as strength, speed, endurance, agility, and others. Therefore, learning movements occurs at varying degrees, and motor coordination processes are not equal among individuals due to differences in abilities and qualities.[12]

The researcher believes that implementing the practical presentation strategy, which involves students and teachers participating with each other in implementing the lesson,[13] generates a love of interaction within the classroom, which raises the level of performance among students and between students and teachers. This positively impacts student interaction.[14][15]

Conclusion

1. The practical presentation strategy has a clear impact on developing motor coordination and teaching students to volleyball serve.
2. Following this strategy during educational units is highly effective in teaching students to serve volleyball.
3. The experimental group outperformed the control group in motor coordination and serve (tennis) volleyball tests.
4. The control group demonstrated significant differences in developing motor coordination and learning to serve (tennis) volleyball.
5. The practical demonstration strategy provided students with ample opportunity to interact collectively through the educational tools used and the presentation, which played a positive role in increasing and improving learning.

Recommendations:

1. The necessity of adopting the practical demonstration strategy in volleyball educational units.
2. The educational process should focus on providing images, drawings, and techniques in volleyball educational units to develop practical abilities, learn skills, and increase excitement, suspense, and motivation among students.
3. Teachers should be encouraged to pay attention to modern strategies related to learning motor skills in educational units.
4. Similar studies should be conducted on other samples in volleyball and other sports.

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