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THE IMPACT OF THE DINES MODEL AS AN EDUCATIONAL MEDIATOR ON COGNITIVE ACHIEVEMENT AND LEARNING OVERHEAD PASSING SKILL IN VOLLEYBALL

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Abstract

The research targets the development and application of educational modules that follow the Dines model for demonstration and also to teach the overhead ball passing technique in volleyball among middle school students in order to improve their cognitive performances. The experimental research, including control and experimental groups, was formed by using pre- and post-tests administered throughout a three-week period, which involved 30 male students enrolled at Al-Zaytoun Model School for Boys. The educational program was organized utilizing different learning formats, which encompassed poster displays, data presentations, and in-depth explanations of motor performance concepts complemented with themed cognitive inquiries. The curriculum design was the development of a series of exercises, from easy tasks to more complex ones, with periodic corrections and feedback provided to the students. Post-assessment evaluation disclosed some notable improvements in problem-solving skills and cognitive abilities among conveners. The gradual and incremental approach provided by the curriculum allowed for higher student engagement and understanding of the technique. Integrating the cognitive, historical, mental, motor, technical, and legal elements while teaching overhead passing strategy enhances students' understanding, encouraging inclusive skill acquisition and cognitive development.

Keywords: Dines model, instructional mediator, cognitive achievement, fundamental volleyball skills.

- **Introduction**

In recent times, the fields of education and teaching have ascended to significant importance in our current era, owing to the utilization of the best models, strategies, methods, and modernized teaching aids at both educational and pedagogical levels. The aim is to advance and elevate learners' performance levels, whether inside or outside the classroom, given that learners are the cornerstone of learning in educational institutions across various foundational stages.

Among the instructional models is the Dines model, derived from constructivist theory, positing that learners attempt to interpret the learning phenomenon based on their prior experiences. This encourages learners and assists them in constructing knowledge, leading to better practical application and serving as an

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effective tool to keep learners engaged and away from monotony and boredom in physical education classes, particularly in volleyball lessons (Alexander et al., 2014).

The importance of this research lies in its earnest attempt by the researcher to activate and renew the learning process through the use of the Dines model, stemming from constructivist theory. It aims to facilitate the task of both students and teachers by correctly applying the model's steps. Herein lies the role of auxiliary educational media, which work to improve learners' performance and create an interactive atmosphere in our field of work, especially in sports, as they have a positive impact on the learning process.

These educational aids are considered an integral and essential part of modern technology, producing scientifically effective products. Multimedia aids are beneficial for learners due to their ability to stimulate students through the integration of various elements such as videos, images, graphics, and other media. These elements play a crucial role in evoking emotions and influencing learners' desire to learn effectively. Additionally, multimedia aids help attract students' attention and facilitate their understanding of the presented educational content, regardless of learning time or the number of students, as they assist in creating connections between different parts of information through various forms such as videos, images, and posters.

The overhead passing skill is considered of paramount importance in volleyball (Yaseen, 2023) as it serves as the foundation for scoring points against the opposing team, requiring a high level of precision. The success of the overhead pass depends on the player's footwork, movements, and positioning when executing the pass. This skill is classified as one with external control, necessitating precise handling by the student with external factors such as the sending player.

As physical education teachers and observers of volleyball matches held between classes, the researchers noticed a significant and noticeable deficiency in the technical performance level of the overhead passing skill in volleyball below the expected and desired level. The educational process urgently requires the use of the Dines model, as it aligns with the research sample. The model consists of several stages, where the teacher undertakes all stages of the lesson, leaving the learner merely as a recipient without giving them the opportunity for positive participation in the learning process.

Moreover, the impact of educational aids enhances the learning process, leading to a smoother learning experience for the overhead passing skill in volleyball. Therefore, it is imperative to use educational aids that create an interactive environment between the teacher, the learner, and the educational content. This necessitates posing a series of questions that encompass cognitive, pedagogical, historical, and skill-related aspects of motor performance to assist learners in increasing their level of perception and understanding of the skill.

Research Objectives:

- To investigate the impact of educational units based on the Dines model as an instructional mediator on cognitive achievement and learning the overhead passing skill in volleyball among the research sample.
- To determine the superiority of the impact between the experimental and control groups in cognitive achievement and learning the overhead passing skill in volleyball among the research sample.

Research Hypotheses:

- There will be statistically significant differences between pre-test and post-test scores for both the experimental and control groups, with higher post-test scores indicating improved cognitive achievement and learning of the overhead passing skill in volleyball for students from the second stage of Al-Zaytoun Model School for Boys.
- There will be statistically significant differences in the post-test results between the control and experimental groups in cognitive achievement and learning the overhead passing skill in volleyball for

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students from the second stage of Al-Zaytoun Model School for Boys, favoring the experimental group.

- **METHODOLOGY**

Research Method:

The researcher employed an experimental research method (controlled experiment) for the two equivalent groups (control and experimental), with pre-test and post-test measures, to suit the nature and problem of the research(O. A. Ali et al., 2022).

Research Population and Sample:

The research population was selected purposively, consisting of students from the second stage of Al-Zaytoun Model School for Boys in Al-Ramadi for the academic year (2023-2024), totaling 108 students distributed across four classes (A, B, C, D), with 27 students in each class. The research sample was selected randomly, with Class A representing the experimental group and Class B representing the control group. Thirteen students were excluded from the study, including those who were deferred, uncommitted, or unwilling to participate (6 students) and those with medical reports (9 students). Classes C and D represented the survey experimental sample, comprising 50 students. Thus, the research sample consisted of 30 students, with 15 students in each group.

Homogeneity of Research Sample:

The homogeneity of the research sample was verified to avoid any factors affecting the main experiment of the research in the variables of height, weight, and age, using the coefficient of variation. Since the values for all variables were less than 30, indicating homogeneity.

Table 1. shows the homogeneity of the research sample (n = 30).

Variables	Unit of Measurement	Mean	Standard Deviation	Skewness
Height	cm	139.33	13.62	9.77
Weight	kg	42.26	7.70	18.22
Age	years	14.46	0.46	3.18

Data Collection Methods, Devices, and Tools:

The appropriate tools are determined according to the research objectives, hypotheses, and questions sought to be answered. Tools are the means the researcher uses to obtain information (Abbas et al., 2009; Adham Ali et al., 2022).

The researcher utilized the following:

Data Collection Methods:

- Arabic and foreign sources
- Observation and experimentation
- Personal interviews
- Assistant work team
- Experts and specialists
- Data recording forms for basic skills and cognitive achievement
- Cognitive achievement test
- Questionnaire form to assess the effectiveness of educational units
- World Wide Web

Devices:

- Computer device type (HP), quantity (3)
- Medical scale for measuring height and weight
- Stopwatch, quantity (3)
- Video recording device type (Casio), quantity (2), made in China

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- Stands, quantity (2)
- Data show device, quantity (1)

Tools:

- Official volleyball court for Al-Zaytoun Model School
- Volleyballs, quantity (15)
- Whistles, quantity (3)
- Flex boards, quantity (3) for displaying skill performance
- Metric measuring tape

Field Research Procedures:

Evaluation of Performance for Basic Research Skills:

To achieve the research objectives and measure the basic skills identified, and taking into account experts' opinions through personal interviews, the researcher relied on the expertise of the academic supervisor to agree on the application of tests by assessing technical performance by resident experts. Thus, the researcher designed a questionnaire after reviewing scientific sources to analyze the contents of each skill. The questionnaire was presented to specialized expert advisors to verify its suitability. Any required modifications were made based on their feedback. Final grading criteria were established for assessing skills: preparatory section (3 points), main section (5 points), and concluding section (2 points), totaling 10 points for each skill (see Appendix 2). A specific registration form was also designated to evaluate students for each skill section.

Technical Performance Test for Overhead Passing (Volleyball Serve):

(a) Purpose of the Test: To measure the technical performance of overhead passing (volleyball serve) (Allam & Mahmoud, 2011)
(b) Tools Used: Volleyballs (3), volleyball court.
(c) Performance Description: The testee stands behind the baseline and performs the overhead passing (volleyball serve) to cross the ball to the opposite side of the court. Each testee is given three attempts.
(d) Recording: The testee's performance in the three attempts is evaluated by resident assessors, with each attempt being graded out of 10.

Scientific Basis of Tests:

Test Validity:

The researcher ensured test validity by presenting the tests to five expert specialists for evaluation.

Test Reliability:

The researcher employed the test-retest(O. Ali & Hamid, 2021) method by filming the performance of randomly selected experimental students (10 students) on Tuesday, October 24, 2023, and then re-filming their performance on Tuesday, October 31, 2023, for assessment by expert evaluators. After processing the data for the evaluators' scores, it was found that the tests and stages of skill performance exhibited high reliability, as they exceeded the critical (r) value of 0.63 at a significance level of 0.05 with 8 degrees of freedom.

Test Objectivity:

Objectivity is achieved when the reliability coefficient is high(O. A. Ali, 2022). It was extracted through the Spearman-Brown formula by assessors, as shown in Table (2).

Table 2. shows the calculated (r) value and its significance between the two tests and objectivity.

Test	Unit of Measurement	Pearson's (r)	Reliability
Overhead Serve (Tennis Serve)	Degree	0.81	0.83

Cognitive Achievement Test:

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The cognitive achievement test is one of the assessments aimed at measuring cognitive achievement. Sometimes referred to as a paper-and-pencil test, it is one of the most important means of evaluating achievement and determining students' academic levels. It is widely used in research studies (Al-Amin, 2001)

After reviewing scientific studies and sources that addressed cognitive achievement tests in volleyball and considering their suitability for the game and the basic skills, the researchers relied on the cognitive achievement scale used by Moloud Shaker (2017), consisting of 30 items.

One of the essential requirements for the study was adapting the scale to suit the research sample. Therefore, the researchers made some modifications by adding items that align with cognitive achievement measurement, resulting in a scale comprising 44 questions covering historical, mental, motor, and skill aspects.

Scientific Basis for the Cognitive Achievement Test: First:

Test Validity: The researcher presented the scale to 13 experts and specialists in volleyball to assess the validity of its items (see Appendix 1). The researcher considered all the observations and opinions provided by the experts. Table (3) demonstrates the validity of the items in the cognitive achievement test.

Table 3. shows the validity of the items in the cognitive achievement test according to 13 experts.

Statement Number	Yes	No	Calculated Chi-Square Value	Significance
5	11	2	6.22	Significant
6	12	1	9.3	Significant
7	11	2	6.22	Significant
8	13	-	13	Significant
9	11	2	6.22	Significant
10	12	1	9.3	Significant
11	11	2	6.22	Significant
12	13	-	13	Significant
13	11	2	6.22	Significant
14	12	1	9.3	Significant
15	11	2	6.22	Significant
16	11	2	6.22	Significant
17	12	1	9.3	Significant

*The tabulated chi-square value (3.84) at a significance level of (0.05) with 1 degree of freedom.

Test Reliability:

To ensure the reliability of the cognitive achievement test, the researcher distributed it to the individuals of the pilot study sample, consisting of 50 students representing classes (c, d) on 2/11/2023, which fell on a Thursday. The researcher employed the split-half method (odd-even item approach). After collecting and analyzing the data from the respondents, the researcher found that the test achieved a reliability coefficient of 0.71. To obtain an unbiased estimate indicating the test's reliability, the Spearman-Brown formula was used(Al-Alwani & Ali, 2023), resulting in a total reliability coefficient of 0.84. This statistically indicates the internal consistency of the test scores.

Test Objectivity:

Objectivity refers to the freedom from personal bias or prejudice on the examiner's part, ensuring consistency in judgment between evaluators (Wang & Lu, 2017). Objectivity was achieved through the high-reliability coefficient.

Pilot Study for the Dance Model:

A pilot study for the dance model program was conducted to ensure the researcher obtains objective results. The researcher prepared and implemented an educational unit for 25 students from class (c) of Al-Zaytoon

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Model Middle School on Tuesday, 7/11/2023. The researcher, assistant team, and physical education teachers were present during the experiment. The objectives of the pilot study were as follows(Saeed, Sabti, et al., 2024):

1. Emphasizing the method of implementing the program's concepts.
2. Overcoming potential errors that may occur in the future.
3. Ensuring the suitability of the concepts and the method of implementing the content and its outcomes.
4. Determining the duration of exercises to align with the prescribed curriculum for the second intermediate stage.
5. Introducing physical education teachers to the Denz model and its procedures.

After completing the experiment, the researcher consulted the results to benefit the educational units.

Implementation of the Introductory Unit:

Before starting the educational units based on the Denz model, the researchers prepared an introductory unit for the experimental group members, which was implemented by the physical education teacher on Thursday, November 9, 2023. The objectives of the educational unit were to:

1. Familiarize students with the Denz model, its importance, and objectives, and encourage student participation and interaction with the teacher for scientific research purposes.
2. Introduce students to the sections of the physical education lesson plan, its procedures, implementation, and organization to form a conception of it.

Pre-Test:

Pre-tests were conducted on Tuesday, 14/11/2023, for both control and experimental groups, according to the lessons for each group. After preparing all the necessary tools and devices, the researchers and the assistant team distributed the cognitive achievement test questionnaire. After completion, the technical performance of the skill of receiving the overhead pass was filmed for the sample individuals (preparatory section, main section, and final section). The footage was then presented to three assessors to obtain the final grade by calculating the mean of the three assessors' scores. Pre-tests demonstrated equivalence between the control and experimental groups. Table (4) illustrates this equivalence.

Table 4. illustrates the equivalence between the control and experimental groups for cognitive achievement and selected fundamental skills.

Test	Measurement Unit	Control Group (n=15)		Experimental Group (n=15)		Calculated (t) Value	Significance
		Mean	SD	Mean	SD		
Cognitive Achievement	Score	13.93	2.03	14.2	2.45	0.32	Not significant
Overhead Passing	Score	2.37	1.56	2.86	1.74	0.81	Not significant

*The tabulated (t) value, which is (2.04), falls below the significance level (0.05) with degrees of freedom (28).

Table (4) demonstrates no statistically significant difference in the research variables between the control and experimental groups for the pre-tests. The computed t-values for the cognitive achievement and overhead passing tests were 0.32 and 0.81, respectively, smaller than the tabulated t-value of 2.04 at a significance level of 0.05 with 28 degrees of freedom. This indicates equivalence between the two groups.

Dance Model Educational Unit:

Preparation of Dance Model Steps:

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After reviewing scientific sources and previous studies and consulting with the academic supervisor, the researchers developed educational units for the Dance Model with a teaching mediator. These units aimed at acquiring cognitive achievement and the skill of overhead passing in volleyball for second-grade middle school students. The units were distributed over 3 weeks, with two educational units per week according to the lesson schedule for the experimental group. The researcher considered the following considerations:

1. Variation and progression of exercises from easy to difficult.
2. Students' recognition of errors through observing skill performance on Flex boards.
3. Achievement of behavioral and educational objectives of the educational unit.
4. Alignment of cognitive information provided to students with volleyball game and skill performance.
5. Achievement of behavioral objectives through the stages of the Dance Model (free play - guided play - searching for common properties).
6. Clarity and relevance of questions to the learned skill, encouraging critical thinking.
7. Integration of skills in final educational units to generalize motor programs.
8. Customization of exercises for the targeted skills based on students' physical and skill levels.

Application of Dance Model:

The Dance Model with a teaching mediator was implemented on Thursday, 16/11/2023, at Al-Zaytoon Model Middle School for the experimental group. At the same time, the control group followed regular physical education lessons according to the curriculum. Below are the sections of the Dance Model educational unit:

(a) Preparatory Section (10 minutes):

This section involved administrative and organizational aspects to prepare the body and raise its temperature for the main section. It included:

- Introduction (2 minutes): Gathering lesson materials, attendance, and starting the lesson.
- General Warm-up (3 minutes): Various activities and exercises to enhance physical abilities, including walking, jogging, upper and lower limb movements, and free jumps.
- Specific Warm-up (5 minutes): Exercises designed to align with the skill to be learned, focusing on sequential exercise performance.

(b) Main Section (25 minutes):

Educational Aspect (9 minutes):

Application of the Dance Model's first stage, the Free Play stage. The teacher explains the skill, its execution steps, and positions while providing cognitive information that includes asking students cognitive questions about it and demonstrating the body posture to give students an initial idea of the performance. Then, using educational media (such as projectors and educational posters) operated by a computer device, a video is shown of the performance at different speeds, between normal and slow, to increase students' focus on the performance and understand the correct motor paths. At this stage, students watch the stages of the skill performance, forming a general idea about the skill. If terms exceed students' mental capabilities and are unclear to them, the teacher directs questions from the students for the teacher to answer, simplifying them to develop students' cognitive aspects about the performance or other related aspects. Afterward, students are allowed to play with various objects and shapes and feel them (such as giving them balls to feel) to build the concept through exposure to the characteristics of objects indirectly, in terms of size, space, or number, in a sensory manner. This stage is necessary for forming the concept and allowing students to connect the concept formed through activities and enjoy them **(Al-Amin, 2008)**. After the presentation, the teacher instructs the students to exit the schoolyard in an orderly manner.

The Practical Aspect (16 minutes):

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In this phase, the skill to be learned is applied along with the prepared exercises, achieving the second stage of the Dinz model, wave playing. Students start slowly and gradually by observing some properties of the idea or concept and connecting it to the concept the teacher previously clarified and explained in the educational aspect. They touch the ball and identify its size, weight, shape, and even color, linking all these components to the scientific application of the skill through three exercises prepared by the researchers from each educational unit. "This stage is considered a constructive stage for the concepts to be learned, using constructive activities to provide students with direct experiences to build the concept for them to learn."

As for the third stage of the Dinz model, it is the search for common properties. In this stage, students apply the idea and its meaning and coordinate it with their previous perceptions about it. Each activity takes about 4 minutes, and "at first, the application is random, and repetition is based on the teacher's view regarding the number for skill reinforcement. During the application, the new idea is coordinated with previous ideas and consolidated to produce new ideas.

(c) Final Section (5 minutes):

This section includes a small game followed by lining up and dismissal.

Post-Tests:

Following the same procedures used for pre-tests, the researchers and the assistant team applied post-tests on Tuesday, 23/1/2024, to measure the research variables: cognitive achievement and overhead passing skill.

Statistical Methods:

The researcher utilized the SPSS program(Awad et al., 2024; Saeed, Khalaf, et al., 2024).

- **Results**

Presentation of Pre- and Post-Test Results for the Control Group:

Table 5. illustrates the calculated t-value and significance of differences between pre-and post-tests for the control group.

Tests	Measurement Unit	Pre-Test Mean	Post-Test Mean	Pre-Test SD	Post-Test SD	Mean Difference	Standard Deviation	Calculated t-value	Significance
Cognitive Achievement	Degree	13.93	20.73	2.03	2.76	6.8	2.68	9.85	Significant
Overhead Passing Skill	Degree	2.37	4.33	1.56	1.29	1.6	0.87	7.27	Significant

*The critical t-value is 2.14 at a significance level of 0.05 with degrees of freedom (df) equal to 14.

Table (5) shows statistically significant differences between pre-and post-test results for the control group in both cognitive achievement and overhead passing skill variables. The calculated t-values for all variables (ranging from 6.8 to 7.27) are greater than the critical t-value (2.14) at a significance level of 0.05 with df = 14.

Presentation of Pre- and Post-Test Results for the Experimental Group:

Table 6. displays the calculated t-value and significance of differences between pre-and post-tests for the experimental group.

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Tests	Measurement Unit	Pre-Test Mean	Post-Test Mean	Pre-Test SD	Post-Test SD	Mean Difference	Standard Deviation	Calculated t-value	Significance
Cognitive Achievement	Degree	14.2	2.45	30.46	5.05	16.26	6.55	9.62	Significant
Overhead Passing Skill	Degree	2.86	1.74	7.06	0.62	4.13	2.12	7.64	Significant

*The critical t-value is 2.14 at a significance level 0.05 with df = 14.

Table (6) indicates statistically significant differences between pre-and post-test results for the experimental group in both cognitive achievement and overhead passing skill variables. The calculated t-values for all variables (ranging from 9.62 to 7.64) are more significant than the critical t-value (2.14) at a significance level of 0.05 with df = 14.

Presentation of Post-Test Results for Both Research Groups:

Table 7. Displays the calculated t-value and the significance of the differences for the ***post-test results*** between control and experimental groups.

Tests	Measurement Unit	Pre-Test Mean	Post-Test Mean	Pre-Test SD	Post-Test SD	Calculated t-value	Significance
Cognitive Achievement	Degree	20.73	2.76	30.46	5.05	6.57	Significant
Overhead Passing Skill	Degree	4.33	1.29	7.06	0.62	7.58	Significant

- The critical t-value is 2.04 at a significance level 0.05 with df = 28.

Table (7) reveals statistically significant differences between the control and experimental groups' post-test results for cognitive achievement and overhead passing skill variables. The calculated t-values for both variables (6.57 and 7.58) are greater than the critical t-value (2.04) at a significance level of 0.05 with df = 28.

- **Discussion:**

Discussion of Results of the First Hypothesis:

Statistically significant differences exist between the pre-and post-test results for both the control and experimental groups in cognitive achievement and learning the overhead passing skill in volleyball for middle school students (Hassan et al., 2023)

Through the presentation and analysis of the pre-and post-test results for both groups, it became evident that the post-test results favored the experimental group in cognitive achievement and learning the overhead passing skill. This confirms the positive impact of the instructional method used for the control group and the Denz model as an instructional mediator for the experimental group. Providing students with detailed knowledge about the skill and game practice contributed to enhancing cognitive achievement. This, in turn, increased the memory's capacity for comprehension and the ability to visualize information.

In this regard, Maha Mohammed (2015) mentioned that knowledge plays an active role in learning sports skills as it contributes to cognitive construction. Through this, the inclusiveness, validity of the educational program, adequacy of tools and methods used, and the extent to which students acquire educational outcomes related to sports activities can be verified (Ghazi & Matansh, 2023).

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The researchers believe that knowledge is one of the first steps in skillful learning. When available to the learner, it complements skill acquisition, enabling the learner to move to the process of positive interaction, information retention, and development of the level by enabling learners to have a correct perception of the details of motor skills in terms of their spatial and temporal conditions(O. Ali et al., 2024). Therefore, sports skills can be described as a cognitive, sensory ability that requires mental abilities, as sports skills are fundamentally cognitive in nature, relying on information received from sensory organs transmitted to the brain, which translates it into commands for execution sent to muscles through motor nerves(Bataineh et al., 2013).

Discussion of Results of the Second Hypothesis:

Statistically significant differences exist between the post-test results for both the control and experimental groups in cognitive achievement and learning the overhead passing skill in volleyball for middle school students.

Through the presentation and analysis of the post-test results between the control and experimental groups, it became clear that there were statistically significant differences favoring the experimental group in cognitive achievement and learning the overhead passing skill. This indicates that the Denz model applied as an instructional mediator had a more positive effect than the control group. This model is one of the strategies based on constructivist theory, leading learners through stages that enable them to acquire knowledge and target the mind as a biological tool. The clarity of learning steps, as well as the nature of presenting educational material tailored to learners' needs by linking theoretical aspects with practical application, leaves a clear and effective impact on raising students' inferential thinking levels, making it easy for them to perform mental operations and apply them practically (Hiebert et al., 2003).

This means that the Denz model, as one of the models derived from constructivist theory, achieved a good method for processing information among students by enabling them to employ their abilities to receive information and all educational stimuli to understand the meaning of educational material. Thinking style and memory activation serve as stimuli for academic achievement. This confirms the relationship between them, and learning methods are linked to thinking (Zhang, 2004).

The researchers believe that the cognitive achievement results for the experimental group were more comprehensive and focused, not superficial information, but rather allowed students to pay attention to something new. Thus, the results of this study align with a study by Khalil Starr and Jassim Mohammed (2018), which found a significant relationship between cognitive achievement and the level of performance of overhead passing skills in volleyball. Additionally, players can improve their cognitive achievement and performance of volleyball skills(O. A. Ali et al., 2024).

The development in skill variables and the superiority of the experimental group over the control group confirm the impact of the Denz model as an instructional mediator. The educational curriculum prepared by the researchers includes a set of behavioral and motor objectives through repetitions while considering the gradation in the difficulty of exercises. Preceded by visual and kinesthetic performance through the instructional mediator, this situation contributed to students being challenged to acquire the skill. Consequently, educators are directed toward the philosophy of the constructivist theory due to a shift in the view of the educational process from mere stimulation of inquiries about external factors influencing the learner as a clear personality to expressing their enthusiasm and cognitive paths to stimulating inquiries about the mind's depths. For example, previous knowledge and the ability to process information and thinking patterns make learning meaningfulMohammed & Rashid, 2018).

- Conclusions:

1. The educational curriculum using the Denz model positively contributed to cognitive achievement and learning the overhead passing skill in volleyball.

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2. The educational curriculum using the Denz model as an instructional mediator surpassed the conventional curriculum in cognitive achievement and learning the overhead passing skill in volleyball.
3. The educational curriculum using the Denz model as an instructional mediator and its application of stages and progressively challenging exercises stimulated students to acquire cognitive aspects of the overhead passing skill in volleyball.

- **Recommendations:**
  1. Utilize the findings of the researchers' study in teaching methods for middle school education, emphasizing the use of the Denz model as an instructional mediator due to its positive impact on cognitive achievement and acquisition of basic volleyball skills.
  2. Focus by physical education teachers on educational models that promote student engagement and grant them a greater role in learning.
  3. Accompany the skill learning process with cognitive, historical, mental, motor, artistic, and legal aspects.
  4. Implement further studies by researchers on other volleyball skills and other sports, encompassing both genders and different age groups.

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