



Article

The Impact of Educational Units Based on the (KUD) Model on Students' Learning of the Skills of Set and Receiving Serves in Volleyball

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Abstract: The problem of this research is that it is a game played by teams, and students must develop some basic skills. Therefore, the need has arisen to adopt modern teaching models, including the KUD (Know-Understand-Do) model. This model focuses on identifying what the learner should know, what they should understand, and what they can practically apply, thus contributing to a more effective learning process, increasing student motivation, and enhancing their acquisition of knowledge and skills. Despite the importance of this model, its use in teaching volleyball skills remains limited. There is a lack of sufficient research examining its impact on second-year volleyball students' learning of setting and receiving serves. Therefore, the research problem is defined by answering the following question: Do instructional units based on the KUD model affect students' learning of setting and receiving serves in volleyball?

This study aimed to determine the effect of teaching units based on the KUD model upon student setting and receiving volleyball serves. The method was explained as: 2xbalance and pre-test and post-test. Subjects and Methods This an Analytical cross-sectional study was conducted on 162 students from second year College of Physical Education and Sports Sciences, University of Kufa. After excluding students who had deferred or failed their exams, 157 students remained. And deferrals and failures: 1 student deferred 4 students failed. Of this population, we randomly selected 60 students to be divided into a test group (20 students) and an application group (40 students). The application group was divided into two groups of twenty students each for usage; the experimental group included students from section (B), and the control-group consisted of students in section (C). The control group took the pre-tests until the start of the units that was planned by the researchers. Over the course of eight weeks, two units were taught each week. At the end of each unit, post-tests were administered by the researchers who collected and statistically analysed the data using SPSS. The most significant finding is that experimental group students did significantly better than controls on the post-test on serving and receiving serves. This indicated that KUD model effectively maps the students' knowledge, skills and understanding in the process of learning. Top priority recommendations applied only to include more experimental programs with similar volleyball skills at a basic level and then compare results against other contemporary methods for teaching.

Keywords: KUD model, setting and receiving skills in volleyball

1. Introduction

The contemporary world is witnessing rapid cognitive and technological transformations that have compelled educational institutions to reconsider their

philosophies and teaching methods. Education is no longer limited to the traditional transmission of information, but has become a dynamic process aimed at developing individuals capable of thinking, analyzing, making decisions, and interacting effectively with educational and life situations. Based on this transformation, the need has arisen to adopt modern educational models grounded in cognitive and perceptual foundations that contribute to the holistic development of learners' intellectual and skill-based abilities, particularly in the field of sports, which requires the integration of physical, mental, cognitive, and skill-based aspects.

Volleyball, a fast-paced sport with constantly changing situations, relies heavily on the learner's ability to quickly perceive various stimuli on the court, such as the ball, teammates' movements, and the direction of play. In light of recent developments in learning and teaching theories, the KUD (Know, Understand, Do) model has emerged as a modern educational approach [1]. The model is based on three fundamental areas according to which learning can be organized: knowledge, comprehension and application. It intends to put the learner at the center of the educational process by way of building up knowledge in a structured fashion, galvanizing deep understandings and then operationalizing understanding into concrete, usable skill. This model is characterized by the closing of the theory-practice gap, since it can be used to teach motor skills that require interaction across cognitive, perceptual and motor domains all at once.

This underscores the need to use modern educational models, like the KUD (Knowledge, Understanding, and Application) model for teaching introductory-violet techniques. This model has educational properties where cognition, perception and motor skills can be incorporated in one learning environment [2], [3]. And that would fit in with a modern trend to focus on the fact that you aren't learning when all you're doing is memorizing and slogging through, but actually thinking about, understanding, and applying the knowledge from a critical perspective.

The significance of this research lies in its focus on one of the modern educational models, the KUD (Know-Understand-Do) model, which centers on making the learner the focus of the educational process by developing knowledge, understanding, and practical application, in accordance with contemporary educational trends. Furthermore, the research is significant in its aim to develop volleyball teaching methods by designing educational units that contribute to students learning the skills of setting and receiving serves [4]. This, in turn, positively affects the quality of the educational process and the level of skill performance.

Research problem:

Based on his field experience, the researchers identified his research problem. Volleyball is a team sport that requires students to possess several fundamental skills. Therefore, the need arose to adopt modern educational models, including the KUD (Know-Understand-Do) model. This model focuses on identifying what the learner should know, what they should understand, and what they can practically apply, thus contributing to a more effective learning process, increasing student motivation, and enhancing their acquisition of knowledge and skills.

Despite the importance of this model, its use in teaching volleyball skills remains limited. There are insufficient studies addressing its impact on second-year volleyball students' learning of setting and receiving serves [5], [6]. Therefore, the research problem is defined by answering the following question: Do educational units based on the KUD model affect students' learning of setting and receiving serves in volleyball?

Research objective:

This research aimed to identify the impact of instructional units based on the KUD model on students' learning of the setting and receiving skills in volleyball.

Research hypotheses:

The researchers also hypothesized that instructional units based on the KUD model have an impact on students' learning of the setting and receiving skills in volleyball.

Field of study: Second Year Students from the College of Physical Education and Sports Science for the University of Kufa. Time interval: October 3, 2025–December 27, 2025 With Respect to Space: The researchers selected the sports hall available in their college (College of Physical Education and Sports Sciences- University Of Kufa).

2. Methodology

Research methods and field procedures:

How to do research:

The topography of the problem justified experimentation as a method used by the researchers. The researchers ran the experiment using a two-group comparable design, with pre- and post-tests.

Learning from the community and a sample:

Study Sample: The study sample consisted of 162 secondary (second stage) students at University of Kufa, College of Physical Education and Sports Sciences. You had five students tossed because they had failed or delayed first year studies; one delayed and four failing students. So that racked up to a total of one hundred fifty-seven students remaining. A sample of (60) students was selected from this group and divided into two groups: a pilot group of (20) students and an application group of (40) students. The application group was further divided into two groups: a control group and an experimental group. The experimental group consisted of students from section (B), and the control group consisted of students from section (C). Each group comprised (20) students. The researchers ensured the homogeneity of the research sample to control for variables affecting the accuracy of the research results. To ensure a homogeneous study group, the researchers employed physical measures (height, body mass; biological age) Using the skewness coefficient The initial experiment was done away from the main experiment on both research groups, before the researchers conducting the main experiment. as shown in Table 1) for both groups (control and experimental).

Table (1) clearly shows that the study group is homogeneous.

Variables	Unit of Measurement	Mean	Median	Standard Deviation	Skewness Coefficient	Result
Height	cm	173.500	172.917	6.198	0.282	Homogeneous
Body Mass	kg	69.000	70.167	8.633	-0.405	Homogeneous
Chronological Age	years	20.000	20.063	1.590	-0.118	Homogeneous

View Table The mean values and coefficients of variation ($\pm$) for mass, height, age at DNA provides the information to know the skewness coefficient values less than (± 1), indicates homogeneity between samples with respect to height, body mass, and chronological age.

The tools, equipment, and methods used in the study:

Ways of collecting data:

- Arabic sources and some other languages
- Interviews with people.
- There are tests and measurements.
- Specific forms on which to input each of the players' test scores.

Equipment and Tools Used:

- A regulation volleyball court.
- An electronic device for measuring height and weight.
- (10) Molten volleyballs.
- One (1) Dell laptop (Polish-made).
- Two (2) Fox whistles.
- Three (3) sports timers.

Field Research Procedures:

Tests and Measurements Used in the Research:

Technical Performance and Accuracy Tests for Volleyball Setting:

First/ Technical Performance Test for Volleyball Setting: (Al-Dulaimi et al., 2015)

- This test measures the technical execution of the SETTING skill in all three facets (preparatory, main, and final).
- What: A standard volleyball court, three volleyballs and a completed evaluation form
 - How It Works: The teacher tosses the ball to the student, who places it in position from position 3. Figure 1: Student with three attempts to correctly execute the pass provided that ball touches neither body nor side of the net or court of the other team.
- The graders sit down with each of the students' five attempts on field and give three points to them all. Here, three points for the practice part, five points for the main part and two points for the last one. The top score for each grader is selected, and the final grade for every student are computed as the average of these three values.

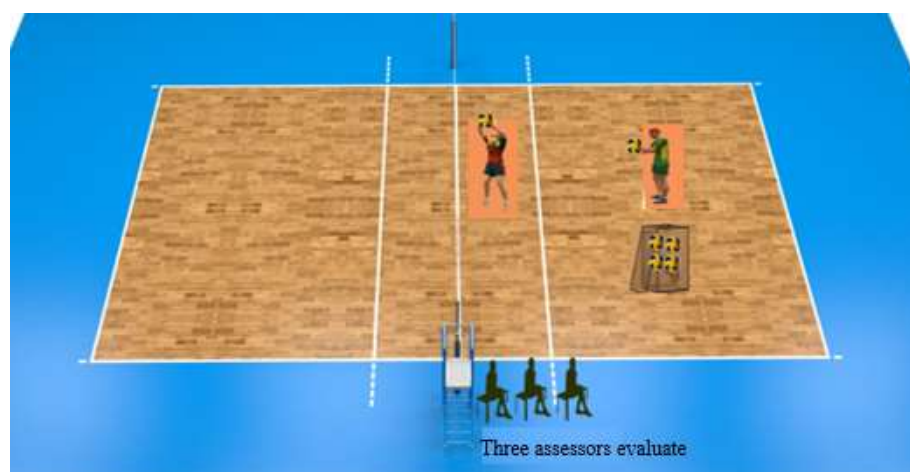


Fig.1 show the Technical Performance and Accuracy Tests for Volleyball Setting

Second / Volleyball Setting Accuracy Test: (Taha, 2009)

- Test Name: Setting Accuracy Test.
- Test Objective: To measure the accuracy of setting skills in volleyball.
- Equipment Used: Basketball backboard, (5) regulation volleyballs, pre-prepared skill accuracy assessment form.
- Procedure: The student stands facing the basket at the free-throw line on the circular line, lifts the ball, then passes it towards the basket, attempting to pass it inside. Each player is given (5) attempts.
- Scoring:
 - Ball far from the backboard: (0) points.
 - Ball far from the basket: (2) points.
 - Ball touches the rim: (3) points.
 - Ball passes inside the rim: (5) points.
 - Maximum score for the test: (25) points.



Fig.2 show the Volleyball Setting Accuracy Test

Description of the Technical Performance and Accuracy Tests for the Underhand Serve in Volleyball:

First: Technical Performance Evaluation Test for the Underhand Serve in Volleyball: (Abdel-Dayem Al-Wazir & Taha, 1999)

- The aim of the test is to check, technically, how well the serve receiving skill performs across all three parts of the skill (preparatory, main and closing).
- What you used: a small number of people, their court of play as follows: 3 (three) regulation volleyballs, a pre-evaluation practice evaluation form.
- Test procedure: the student is tested on serve-receiving skills while standing and performing it 3 times in a row.
- Registration : Three examiners evaluate each student's three attempts in the field and award them 3 marks each. The scores for the First Attempt will be of ten marks split into three skill sections- Three Marks for a preparatory section; four marks for a main section and Three Marks for a Final Section. Next, the highest score from each examiner is chosen, and the final score for each student across the board located by calculating the average of these top three scores. This is shown in Figure (3).



Fig.3 show the Technical Performance Evaluation Test for the Underhand Serve in Volleyball

Second: Accuracy Assessment Test for Receiving the Underhand Serve in Volleyball (Abdel-Dayem Al-Wazir & Taha, 1999)

- The objective of the test is to evaluate your performance at receiving an underhand serve in volleyball. This meant an actual volleyball court, ten regulation volleyballs, a metal measuring tape and colored tape to separate the court. Method: The test student attempts

to travel from region (A) into place (2) five occasions and in the same way five times to maneuver from area (B) into position (2). 1) Based on their respective zones, the student (who must use this underhand pass method and throw the ball to the goal as shown in Figure 48. • Scoring: the student gives one point to each spot on which the ball lies, as shown below; if he/she meets with a target (the table) at right position and aligned to hit properly points at themselves – extra three points. Each right ball that touches the sides of the goal (the table) gives two points for the pupil. - The inspector gets one if the ball falls well outside the penalty area and away from the goal, - The examiner no points; If it falls far from the call but outside of that place or distance.

The highest possible score that you can achieve on the test is thirty points.

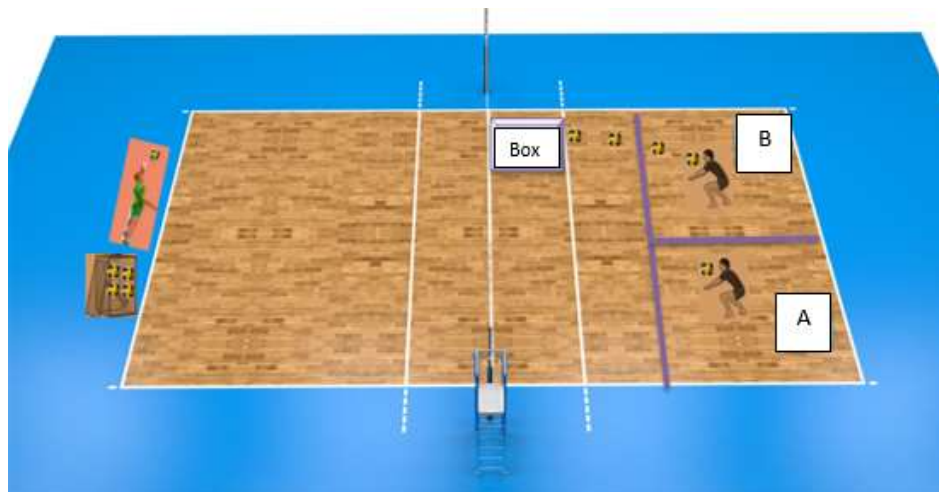


Fig.4 show the Accuracy Assessment Test for Receiving the Underhand Serve in Volleyball

Pilot Test for the Research Tests:

The pilot test was conducted on 2 / October /2025 at ten o'clock am in the auditorium of College of Physical Education and Sports Sciences, University of Kufa. Twenty students were randomly selected from the chosen population of the research. This pilot test had the following aims:

To prepare the field and equipment for testing.

Define, in the multidimensional aspect of units of learning.

Learn why the study group performed on the tests.

You must keep the researchers and support staff well-trained; weigh the pros and cons of test delivery on its needs and methodology.

To discover in practice the problems which experts are likely to encounter when having done these tasks at school.

Main Experiment Procedures:

Pre-tests:

The researchers conducted pre-tests on the research population for both the control and experimental groups on Tuesday, October 14, 2025.

Equivalence of the Research Groups:

To attribute any differences in the post-test results for the variables under study to the effect of the experimental factor, the researchers verified the equivalence of the two groups using the independent samples t-test, as shown in Table (2).

Table (2) shows the equivalence of the two research groups.

Variables	Unit of Measurement	Control Group		Experimental Group		Calculated t-value	Sig.	Statistical Significance
		Mean	SD	Mean	SD			
Technical performance of the setting skill	Score	4.160	0.18	4.110	0.45	0.200	0.845	Not Significant
Setting accuracy	Score	11.500	1.048	11.000	0.894	0.466	0.651	Not Significant

Technical performance of serve reception	Score	5.97	0.57	6.16	0.34	1.11	0.273	Not Significant
Serve reception accuracy	Score	12.12	1.50	12.43	1.31	0.62	0.536	Not Significant

Preparation and Implementation of Learning Units According to the KUD Model:

Each volleyball skill requires specific learning units. Based on this principle, the researchers formulated the learning units and implemented them in accordance with the steps of the KUD model. The researchers focused on understanding the skill and its nature by explaining and clarifying it using visual aids such as a display screen and various images of skill performance. This was the first step, consistent with the model's phases. As previously explained, the first phase of the strategy is the "Know" phase. The researchers then focused on the second step, which is understanding the skill specifically and the game in general. This involved explaining the principles and rules of the game and the skill, and how to perform it, in accordance with the second phase of the model, "Understand." All of this was achieved by utilizing the educational content within the learning units. Finally, in the last stage of learning according to the model, the researchers applied the skill through multiple repetitions to achieve higher levels of skill performance among the students. This approach took into account the individual differences in students' performance and abilities, and the researchers based his work on this principle by involving everyone and fostering a spirit of competition among them. The experimental group was selected, and a suitable learning environment was provided for all learners. This environment was based on diversifying activities and tools, thus enabling each learner to achieve the desired objectives. The researchers ensured a thorough understanding of all aspects of the learning unit, including its objectives and procedures, and was convinced that it was designed to benefit the learners and help them achieve better learning outcomes.

In this case, the learning program applying KUD model consists of 8 units (90 minutes each), and utilizes two units in a week. Curricula are built to meet specific goals relative to the skills of learners and resources available. You cannot teach or learn the whole curriculum in one shot, so short learning units help you to divide that. A learning unit is a sequence of connected learning experiences that, when processed as a whole, will work in concert to achieve a distinct aim. The learning unit is divided to: the preparatory section, the main section and concluding.... Typical of a preparatory section, there were general as well as specific warm-ups. One major component was the shows of ability, the educational part and application piece. The final segment had a short game and dismissal. These sections incorporated the necessary strategic phases in order to meet the objectives assumed and proposed by the researchers for this research project. The combined time for the education program and determined timing for each section of the learning unit are outlined below:

(Continues to this point, and the translation stops here)

The researchers also considered several fundamental principles of education when developing the learning units, including:

- Defining the specific objectives for each learning unit.
- Ensuring that each learning unit achieves a learning objective derived from broader educational goals.
- Ensuring that each exercise within the learning unit contributes to achieving its objectives.
- Allocating specific time slots for each exercise.
- Varying learning situations to prevent boredom and frustration among the experimental group.
- Gradually progressing from easy to difficult exercises.

Post-Tests:

The researchers, with the assistance of the support staff, conducted post-tests for

the research population after the completion of the educational units, following the steps of the KUD model. These tests were administered on Tuesday, December 23, 2025, under the same conditions as the pre-tests.

Statistical Methods Used in the Research:

The researchers used the SPSS statistical package to analyze the research results, including:

- Arithmetic mean
- Standard deviation
- T-test for paired samples
- T-test for independent samples
- Skewness coefficient.

3. Results and Discussion

Presentation, Analysis, and Discussion of Results:

Presentation of pre- and post-test results for the control and experimental groups for the variables under investigation:

Table (3) shows the arithmetic means and standard deviation of the pre- and post-test results for the control group for the variables under investigation

Research Variables	Unit of Measurement	Pre-test		Post-test		Calculated t-value	Sig.	Statistical Significance
		Mean	SD	Mean	SD			
Technical performance of the setting skill	Score	4.160	0.18	6.777	0.40	12.42	0.000	Significant
Setting accuracy	Score	11.500	1.048	17.666	1.366	8.770	0.000	Significant
Technical performance of serve reception	Score	5.97	0.57	7.27	0.72	5.78	0.000	Significant
Serve reception accuracy	Score	12.12	1.50	17.18	1.22	12.90	0.000	Significant

Table (4) shows the arithmetic means and standard deviation in the results of the pre- and post-tests for the experimental group for the variables under investigation.

Research Variables	Unit of Measurement	Pre-test		Post-test		Calculated t-value	Sig.	Statistical Significance
		Mean	SD	Mean	SD			
Technical performance of the setting skill	Score	4.110	0.45	8.166	0.278	13.036	0.000	Significant
Setting accuracy	Score	11.000	0.894	20.166	1.169	15.254	0.000	Significant
Technical performance of serve reception	Score	6.16	0.34	8.04	0.41	15.000	0.000	Significant
Serve reception accuracy	Score	12.43	1.31	19.18	1.10	13.17	0.000	Significant

Table (5) shows the arithmetic means and standard deviation in the post-test results for the control and experimental groups for the variables under investigation [7].

Research Variables	Unit of Measurement	Pre-test		Post-test		Calculated t-value	Sig.	Statistical Significance
		Mean	SD	Mean	SD			
Technical performance of the setting skill	Score	4.110	0.45	8.166	0.278	13.036	0.000	Significant
Setting accuracy	Score	11.000	0.894	20.166	1.169	15.254	0.000	Significant
Technical performance of serve reception	Score	6.16	0.34	8.04	0.41	15.000	0.000	Significant
Serve reception accuracy	Score	12.43	1.31	19.18	1.10	13.17	0.000	Significant

Discussion of the Results:

Based on the results presented in Tables (3) and (4), which demonstrate statistically significant differences between the pre-test and post-test scores for both groups, as well as significant differences between the experimental and control groups in the post-test, the researchers attributes the significant improvement in the setting and serve reception skills among the control group participants to several variables and factors that interacted during the learning process, leading to the observed differences between the pre-test and post-test measurements [8], [9].

Traditional instruction is considered one of the most commonly used teaching approaches in physical education. It is based on the principle of learning through observation and imitation, whereby learners imitate the model performance demonstrated by the instructor. This is consistent Social Learning Theory, which emphasizes that learning occurs through observation and imitation, particularly during the early stages of motor skill acquisition. Furthermore, regular repetition of skill performance contributed to improving motor performance by facilitating the development of the neural pathways responsible for movement. This finding is also consistent who stated that repeated practice facilitates the stabilization of motor programs within the central nervous system, thereby leading to improved performance levels [10].

While the significant differences shown in the tables above for the experimental group are attributed by the researchers to the use of educational units according to the (KUD) model in terms of planning the educational units, preparing the exercises, and implementing them in a precise manner according to the model's steps, the exercises developed by the researchers and implemented using an educational program based on the (KUD) model have moved the learners from the usual pattern, in which they are passive recipients of information presented by the teacher, to a new pattern based on questioning and giving the learner the opportunity to explore the phenomena related to the two skills (setting and receiving the serve) in volleyball and choosing appropriate solutions [11], [12]. This motivated the learners to respond to this model, striving for success, demonstrating their abilities, affirming their individuality, and proving their potential, which is often viewed as a lack of effort and apathy [13]. This facilitated the process of understanding and comprehending the skills being researched in its three sections (preparatory, main, and concluding). The KUD model is a modern educational model that organizes the learning process logically, beginning with knowledge building, then deepening understanding, and ending with practical application. This achieves integration between cognitive, perceptual, and skill-based aspects. The results of the current research showed that adopting this model significantly improved students' volleyball serving and receiving skills compared to the traditional method.

The researchers attributes the significant difference to the steps of the implemented model, which played the most significant role. The "Know" phase provided students with the basic concepts and information related to the studied skills, such as performance phases, technical points, and common mistakes. This prior knowledge organization helped build a clear mental framework for the skill.

Furthermore, presenting knowledge in an organized and specific manner reduces the cognitive load on the learner during performance [14]. This was confirmed in his theory of cognitive load, where he indicated that organizing information contributes to improving the speed of mental processing and response to stimuli.

Furthermore, the learner's prior knowledge of the skill contributed to improving their volleyball setting and receiving skills by reducing decision-making time during

performance. This aligns assertion that prior knowledge is a crucial factor in the speed of motor perception in team sports [15]. While the second step or phase of the model, the "Understand" phase, played a significant role in yielding meaningful results, the "Understand" phase is the core of the KUD model. In this phase, students moved from simply knowing information to analyzing the skill and understanding the relationships between its components, thus contributing to meaningful learning. Indicated that learning is more stable when based on understanding rather than memorization, a fact reflected in the experimental group's results through the clear increase in their level of cognitive achievement. The researchers believes that this stage contributed to the development of kinesthetic perception, as students became more capable of interpreting motor situations on the field, such as timing jumps, determining the ball's direction, and selecting the appropriate skill [16]. This is confirmed, who stated that perceptual understanding is one of the most important determinants of high performance in sports

Furthermore, the researchers believes that the third phase, the "Do" phase, was crucial in making a difference in learning the skills of setting and receiving serves in volleyball. In the "Do" phase, students practically apply their acquired knowledge and understanding, leading to a clear improvement in their skill level in setting and receiving serves. The structured transition from knowledge to understanding and then to application contributed to reducing technical errors and increasing performance accuracy. This aligns with the kinesthetic learning model proposed which emphasizes that effective kinesthetic learning depends on the gradual transition from perception to execution.

Table (5) shows the post-tests the experimental group was better than control over setting and serve in volleyball. It is important to understand though, that this advantage cannot solely be explained by more repetition or longer duration of the programme. Rather, it is drawn from the quality of learning provided by educational units based on KUD models [17]. Model showing the integration of knowledge, understanding and use in an integrated framework for education. According to the researchers, this difference may be due to using the KUD model which uses educational units where each student has sufficient time during learning according to their respective abilities and skills as well as how information about education is delivered. That aligns with what was said here: "The learning must be growing, how else can there be any kind of progress in learning unless a teacher follows steps revolving around good principles of learning and teaching. Before you can learn to reproduce a skill accurately, the explanation, demonstration and practice of correct performance must be clear. But you should also continue to monitor this until you've established a stable performance [18]. Furthermore, by providing feedback to a student they are motivated while forcing them to do things correctly with enthusiasm and excitement. R v Isa... T n H and O 9785 B D I.. The gain made by the control group is simply a function of how frequently they were taught and practice. However this shift still was not very deep regarding the cognition and perception. In contrast, the experimental group performed significantly better. Because of this, the KUD model is to involve the learner in a learning arrangement that is interconnected (knowledge, understanding and application). Which resulted in simultaneous learning that had cognitive, perceptual and skill-based components

The researchers finds for the experimental group that KUD-based educational was better than traditional method in improving students skill in serving and receiving serve volleyball. The reason for this is that it didn't just develop skills, but also worked on cognitive and perceptual development

4. Conclusion

The conclusions reached, using the research findings collected in the study population were: The students' learning progress in volleyball setting and receiving skills improved due to the educational units designed based on KUD compared with the traditional method. Based on the post-test results, all of the students in the experimental group show a significant improvement toward their SKIN skills performances referring to setting and receiving skills. Reflected KUD model enhanced their kinesthetic understanding by integrating knowledge, comprehension and skill performance during class practice, which predicted improvements in students' accuracy as they executed correct setting and receiving skills. There were modest gains in learning the condition and receiving skills through traditional methods, but this gain was not as effective including the educational program using KUD model. The researchers make the following recommendations from research findings and conclusions. KUD model for Teaching basic Volleyball Techniques especially in setting and receiving serves is imperative because this accelerates the LEARNING STYLE as a Coach and also increases SKILL PERFORMANCE. Promoting the use of innovative educational models to promote a holistic understanding and transfer of knowledge in teaching and implementing integrated theoretical-practical learning units by physical education teachers. Creating additional KUD-model based educational programs teaching various fundamental volleyball skills and testing their results with other contemporary teaching methodologies. Researching the impact of the KUD model in other educational and sports domains and conducting longitudinal studies with young children, older adolescents, than male or female, to validate these results.

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