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Application of the Syntax Learning Model Based on the Umbrella Model to Improve Cognitive Learning Outcomes in Volleyball Material.

Dewi Endriani[1], Syamsul Gultom[1], Basyaruddin Daulay[1], Muhammad Reza Destya[1]

[1]*Department of Sports Coaching Education, Faculty of Sports Science, Universitas Negeri Medan, Medan, Indonesia*

**Corresponding Author: Dewi Endriani*
Email: endriani@unimed.ac.id

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Abstract

This study aims to apply a syntax-based learning model using the umbrella model approach to enhance students' cognitive learning outcomes in volleyball material. The research was conducted through two stages: a limited trial and an expanded trial. The limited trial was carried out in Class E, Semester II, involving 20 students. After revisions and improvements, the expanded trial was conducted in Class A, Semester II, with 40 students. Both trials used a one-group pretest-posttest design, and data analysis employed the Shapiro-Wilk test using SPSS Version 25. The results showed that the control class obtained an average cognitive score of 30.03 (47.50%) with a standard deviation of 1.54, while the experimental class achieved an average score of 35.02 (50.00%) with a standard deviation of 1.714. Statistical testing at a 95% confidence level revealed a significance value of 0.00 (<0.05), indicating that Ho was rejected. This means there was a significant difference between students taught using conventional methods and those taught using the syntax learning model based on the umbrella model. Thus, it can be concluded that the application of the umbrella model-based syntax learning model effectively improves students' cognitive learning outcomes in volleyball material. The model encourages active learning, structured understanding, and better mastery of cognitive concepts compared to traditional teaching methods.

Introduction

Physical education, sports, and health (PJOK) constitute an integral component of the educational system that must be implemented in schools, playing a crucial role in the development of a well-rounded Indonesian individual (Ahmad, 2016; Suriad, 2025; Raswin & Nasution, 2025). In PJOK education, physical exercise encompasses not only the attainment of physical fitness but also the development of motor skills, character building, and the enhancement of students' creative thinking (Ericsson, 2011; Hapsari & Wahyudin, 2025; Fauziah et al., 2025). It is crucial to establish effective ideals in character development in our pupils from an early age to ensure they become well-rounded individuals in the future.

PJOK is an educational approach that fosters students' personal and physical development while enhancing their intellectual capabilities in both academic and life contexts, aiming to cultivate well-rounded individuals through effective learning processes and the judicious selection of instructional methods by educators (Dewi & Faridah, 2022). PJOK educators must comprehend several attributes of PJOK instruction and tailor them to the instructional content as an interactive process. A key attribute of educators is the capacity to create and execute effective and high-quality learning programs. Medan State University (UNIMED) develops PJOK educators via the Faculty of Sports Sciences (FIK). PJOK educators are developed

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through a learning process encompassed in the course distribution of the FIK curriculum, which comprises both theoretical and practical sports courses (Anwar et al., 2024; Sinulingga et al., 2021; Barikah & Kurniawan, 2025). One of the sports training programs encompasses fundamental volleyball skills lessons. The fundamental volleyball skills course is a requisite component for three academic programs: Physical Education, Health and Recreation (PJKR), Sports Coaching Education (PKO), and Sports Science (IKOR). Practical lectures are conducted to master fundamental motions and technical skills in volleyball, emphasizing the importance of psychomotor skills in the acquisition of basic competencies. Fundamental volleyball abilities encompass essential motions that students must proficiently execute for both footwork and body mechanics. Fundamental abilities in volleyball are essential, effective, and efficient methods aligned with the game's regulations to attain the desired objectives.

This aligns with the perspective of (Marsiyem et al., 2018) & (Pratama, 2020) that proficiency in fundamental techniques is essential for enhancing volleyball playing skills. Sitompul et al. (Endriani, Sitompul, et al., 2022), (Endriani, Akhmad, et al., 2022) and (Mustaghfirin & Sukiyandari, 2020) assert that fundamental volleyball skills constitute a methodology refined via practice, aimed at resolving movement challenges in the most efficient and effective manner. The fundamental movements in volleyball encompass locomotor and non-locomotor actions, as well as their combinations, both with and without the ball (Akhmad et al., 2022; Hapsari & Wahyudi, 2025; Lutz et al., 2020). Fundamental volleyball methods encompass below-hand passing, float serving, above-hand passing, smashing, blocking, underhand serving, and tennis-style serving (Saputra & Nasrulloh, 2023), (Vai et al., 2021), (Yulianti et al., 2024). The competency criteria for the basic volleyball skills course requires students to accurately explain and demonstrate the fundamental abilities of volleyball, specifically: (1) the ability to articulate and perform the essential motions of the game. Students can articulate and apply fundamental volleyball tactics, including underhand reception, overhead passing, smashing, blocking, underhand serving, and tennis-style serving (Santoso & Wiyanto, 2021). Student success in learning participation is evidenced by the degree of comprehension and the enhancement of academic performance, as measured by the defined course competency requirements throughout the educational process. This aligns with the theory proposed by Oktaviani et al (Susmiarti, 2024). Learning design theory, as defined by Koswojo (Koswojo et al., 2020), provides clear direction on the development of educational strategies to facilitate student learning.

This theoretical framework for learning design has three variables: conditions, treatment (methods), and outcomes (Fakfare et al., 2025; Yang et al., 2025; Singh et al., 2022). This basic volleyball skills course evaluates the fundamental principles of knowledge, skills, values, and attitudes in the sport of volleyball. This lecture will critically evaluate and analyze numerous theories, techniques, and schools of thought pertinent to the learning process. Students are afforded extensive opportunities to execute and evaluate various repetitive exercises in practicing the five volleyball techniques, both theoretically and practically. This includes implementing diverse training methods related to bottom passing, top passing, smashing, serving, and blocking, as well as introducing innovative concepts for students who will engage in teaching through the exploration of more pertinent volleyball sciences.

This can be implemented through a framework of principles and admirable behaviors in daily societal interactions (Hang, 2025; Ansori et al., 2024; Sipahutar et al., 2024). The challenge encountered in this course is the inadequate proficiency of lecturers in implementing diverse learning models, favoring those that enhance students' critical, logical, analytical, and structured thinking skills. The features of students in the learning process conducted by lecturers are solely centered on the lecturer, resulting in a unidirectional learning experience.

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The instructional model employed in this course follows a traditional framework, comprising a warm-up phase, a drill phase, and a closing phase. This educational paradigm emphasizes the verbal transmission of content from an instructor to a cohort of students, with the objective of enabling maximal mastery of the subject matter by the students.

The challenges encountered pertain to treatment, including organizational tactics, delivery strategies, and management strategies (Saleh et al., 2024; Alnoor et al., 2024; Qiu et al., 2024). If a lecturer can implement this treatment, the ensuing learning technique will engage students in creative thinking; the treatment refers to the delivery of learning content. The organizational management strategy (Aliffudin et al., 2024) defines the approach for arranging instructional content as a structural strategy, which pertains to the method of sequencing and synthesizing interconnected facts, concepts, procedures, and principles. Structuring learning is a crucial aspect of instructional design. The findings from the volleyball study indicate a teacher-centered approach, which limits student engagement. This presents a challenge that requires resolution. Currently, the employed instructional model consists of Warming Up, Drill, and Closing phases. In this scenario, the lecturer predominantly assumes the primary role in instructing PJOK, particularly in volleyball, as they serve as the principal source of information.

Consequently, students merely absorb the content presented by the lecturer, lacking opportunities for independent exploration of the subject matter. As a result, in the lecturer's absence, the learning pertaining to the material appears to cease. Additionally, learning must be effective, efficient, and engaging. Effective learning outcomes provide students with the opportunity to acquire certain skills, knowledge, and attitudes that contribute to their overall happiness. Effective learning enables pupils to acquire valuable knowledge, including facts, skills, conceptual values, and the ability to coexist harmoniously with others, or to attain desired outcomes.

Factors influencing student learning efficiency must be evaluated completely, as learning processes do not occur in a vacuum. Students are the primary focus of education in accordance with the contemporary learning paradigm that emphasizes a student-centered approach. Conversely, institutions primarily function as suppliers of educational resources and facilitators of an environment favorable to learning. Consequently, student learning outcomes in fundamental volleyball skills classes are also inadequate. This is evident from the percentage of students' scores in the fundamental volleyball skills course during the past two years, as illustrated in Table 1 below.:

Table 1. Final Grade for Basic Volleyball Skills Course

Mark	Academic Year 2022/2023		Academic Year 2023/2024	
	Regular	Ektensi	Regular	Extension
A	15,0%	15,0%	15,0%	20,0%
B	40,0%	45,0%	45,0%	35,0%
C	45,0%	35,0%	40,0%	45,0%
AND	0,0%	5,0%	0,0%	0,0%

Source: Unimed Faculty of Sports Sciences

Table 1 indicates that the learning outcomes for the fundamental volleyball skills course have not improved substantially. The final assessment of fundamental skills in the basic volleyball courses for the 2022/2023 and 2023/2024 academic years indicates a decline in the overall performance in the basic volleyball skills course. Additionally, it was observed that some

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students achieved high grades while others received significantly low grades. This may pertain to the suboptimal, unengaging, and monotonous learning model devised by the instructor.

Implementation of educational models an umbrella including three components: handrail, canopy, and fastening mechanism. The handle comprises a structure (Showing), the stem encompasses multiple structures (Matter, Warming Up, Exercise, Analysis, Cooling Down), and the ceiling contains a structure (Evaluation). This educational paradigm is intended to enhance students' competencies in the volleyball learning process, focusing on the development of their potential across affective, cognitive, and psychomotor dimensions. Designed learning is interrelated, focusing not solely on the lecturer but primarily on the students. Education aimed at inspiring pupils to engage in critical thinking and enhance their analytical skills, in addition to acquiring knowledge. Parasol This is anticipated to enhance the engagement of learning, as the process derived from this educational model is organized and methodical, compelling students to prepare the material prior to instruction. This is facilitated by an evaluation that necessitates students to ready themselves for comprehending the content presented by the lecturer through the RPS (Semester Learning Plan) before the material is delivered in class.

Methods

This research has produced a Syntax learning model, grounded in the umbrella model, aimed at enhancing volleyball passing proficiency in the acquisition of fundamental volleyball abilities. The development research model cited in this study is (Sugiyono, 2017). An early draft of the product is created based on the data obtained during the preliminary study phase. The product development phase has three stages: the creation of the initial draft, restricted trials, and extensive trials. The elucidation of each phase is as follows: (1) The drafting stage involves identifying and formulating a conceptual learning model for product design, which will serve as the foundation for the subsequent development process. (2) The limited trial stage entails conducting trials of the draft/product with a small sample group; the results will be revised based on feedback and conditions observed during field trials. (3) The expanded trial stage consists of conducting trials on a larger sample group to produce a finalized draft/product that has been developed.

Research Procedures and Subjects

Next, after the product is finished, it enters the testing stage. The testing phase was carried out twice, namely the limited testing phase and the expanded testing phase. Limited trials were carried out in class E semester II with a total of 20 students. After carrying out improvements, it continued to the expanded trial phase which was carried out in class A semester II with a total of 40 students. Limited and expanded trials were carried out with *one-group pretest-posttest design* by using test *Shapiro Wilk* SPSS Version 25 as on Figure 1. following (Sugiyono, 2016).

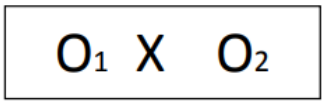

Figure 1. Research Pattern one-group pretest-posttest design

Information:

THE_1 = value *pretest*

X = *treatment*

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THE_2 = value *posttest*

In this design, the test is carried out twice, namely before (*pretest*) and after being treated (*posttest*). The steps taken in this trial are: (1) conduct *from the priest* to measure students' initial abilities regarding basic volleyball skills courses using instruments that have been tested, (2) provide learning model treatment *umbrella* based on training in volleyball courses, (3) holding *posttest* to measure students' abilities after being given treatment. The results of limited and expanded trials will be input for improving the learning model being developed.

Results and Discussion

Implementation of a syntactic learning approach grounded in the umbrella model to enhance volleyball passing proficiency, designed to address the competency challenges encountered by university graduates in the context of globalization. The model's formulation encompasses characteristics that focus on: 1) students, 2) the necessity for students to engage actively and creatively, 3) students' capacity to resolve issues derived from conducted analyses and generate evaluations for corrective purposes, 4) lecturers serving as experts, motivators, facilitators, and supervisors, 5) the presence of a researchable problem, 6) alignment with physical education learning objectives, and 7) the production of a tangible outcome. Umbrella Learning Model Volleyball courses based on training have student-centered attributes. Additionally, the learning model devised by the researchers pertains to the PJOK learning model, which is frequently employed. This model is characterized by a lecturer-centered approach and comprises three stages: (1) Warm-up, (2) Core, and (3) Cooling. Consequently, it is essential to formulate student-centered learning models using umbrella training methodologies focused on fundamental volleyball skills courses. Outcomes of constructing educational models Umbrella comprising three components: Handrail, Roof, and Fastening. The handle comprises a structure (*Showing*), the stem encompasses structures (Matter, Warming Up, Exercise, Analysis, Cooling Down), and the roof includes a structure (Evaluation). This educational strategy is intended to enhance students' skills in the volleyball learning process, focusing on the development of their cognitive potential. Figure 2 illustrates the Umbrella learning model, as depicted in the subsequent image.:

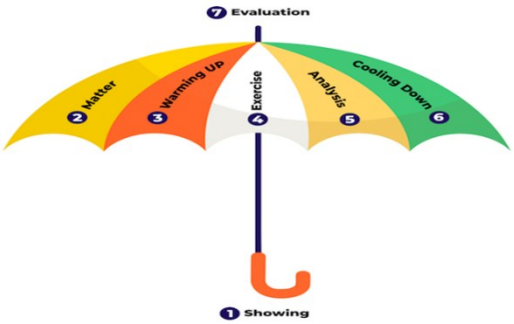

Figure 2. Learning Model Umbrella Training Based on Volleyball Courses

Learning that is designed is interconnected with each other, so that learning is not only centered on the lecturer, but on the students themselves. Learning that is designed to motivate students to think critically and be able to develop their ability to analyze, besides learning *Umbrella* This is expected to make learning more interesting because the process resulting from this learning model is structured and systematic and makes students prepare the material before entering learning because there is an evaluation and *showing* which forces students to prepare themselves to understand the material provided by the lecturer through the RPS (Semester Learning Plan) before the lecturer provides the material in class.

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Description of Research Results for Control Group and Experimental Group

Cognitive Learning Outcomes

The cognitive learning results of the control class in the field trial can be shown in Table 2. frequency distribution as follows:

Table 2. Frequency Distribution of Control Class Cognitive Learning Outcomes

Interval Class	be	relative fi
27-28	4	10.00 %
29-30	19	47.50 %
31-32	14	35.00 %
33-34	3	7.50 %
Amount	40	100 %

Based on statistical calculations, the average value of cognitive learning outcomes for the control class is a mean of 30.03 with a percentage of 47.50% and a frequency of 19, before the median class with a value of 4 and a percentage of 10%, the total frequency after the median class is 17 with a percentage of 42.50%. and standard deviation 1.54. The histogram of cognitive learning results for the control class can be seen in Figure 3. as follows:

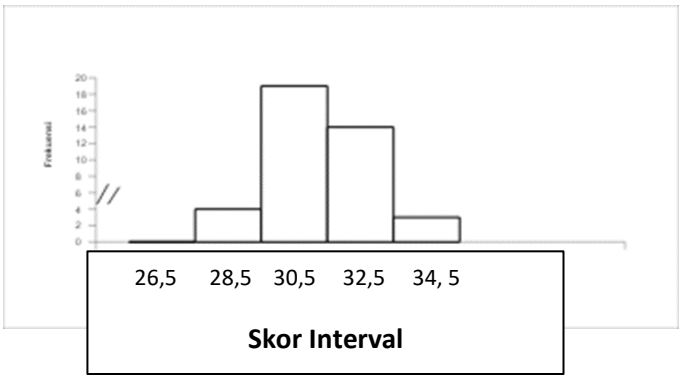

Figure 3. Histogram of Control Class Cognitive Learning Results

Based on statistical data calculations, the average value of cognitive learning outcomes for the control class showed a value of 30.25. Furthermore, the cognitive learning results of the experimental class in the field trials can be displayed in Table 3 frequency distribution as follows:

Table 3. Frequency Distribution of Experimental Class Cognitive Learning Results

Interval Class	be	relative fi
32-33	5	12,50%
34-35	20	50,00%
36-37	10	25,00%
38-39	5	12,50%
Amount	40	100%

Based on statistical calculations, the average value of cognitive learning outcomes for the experimental class is a mean of 35.02 with a percentage of 50.00% and a frequency of 20, before the median class with a value of 5 and a percentage of 12.50%, the total frequency after

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the median class with a value of 15 and a percentage of 37.50% and standard deviation 1.714. The histogram of cognitive learning results for the experimental class can be seen as shown in Figure 4.4 as follows:

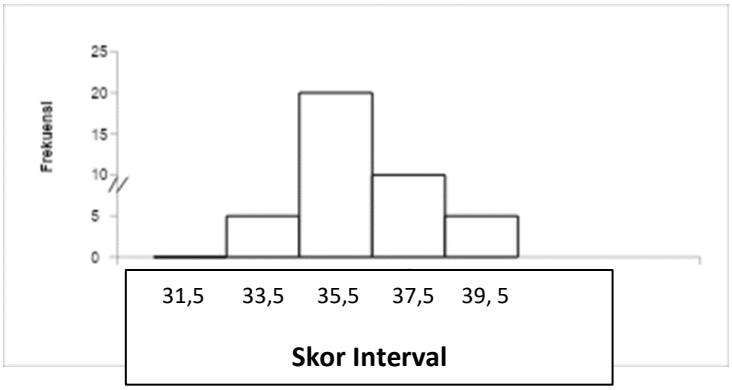

Figure 4. Histogram of Experimental Class Cognitive Learning Results

Normality Test

The data normality test is a test that must be carried out before carrying out hypothesis testing which aims to ensure that the data that has been collected is normally distributed or taken from a normal population. The normality test used in this research is the test *Shapiro Wilk*. An effective and valid normality testing method used for small samples. In this study, there were 40 research subjects. So normality testing using *Shapiro Wilk is very* suitable for this research. To make testing easier, researchers used SPSS Version 25 software. The results of the cognitive pretest and posttest data normality tests can be seen in Table 4 as follows:

Table 4. Normality Test Results of Pretest and Posttest Cognitive Data

Tests of Normality				
	Group	**Shapiro-Wilk**		
		Statistic	**df**	**Say.**
Cognitive Pretest Score	Control	0,957	40	0,134
	Experiment	0,966	40	0,259
Cognitive Posttest Score	Control	0,954	40	0,101
	Experiment	0,951	40	0,082

Based on the test results with a 95% confidence level, it is obtained: 1) The control group's cognitive pretest score had a significance of 0.134 > 0.05; so H_0 accepted; 2) The experimental group's cognitive pretest score had a significance of 0.259 > 0.05; so H_0 accepted**;** 3) The cognitive post test score of the control group has a significance of 0.101 > 0.05, so H_0 accepted; 4) The experimental group's cognitive posttest score had a significance of 0.082 > 0.05; so H_0 accepted,

Homogeneity Test

Apart from the normality assumption that must be met, the homogeneity assumption must also be met, meaning that the variance between groups must be homogeneous. In this study, the homogeneity test used *lavender oil* used SPSS software version 25. The results of the homogeneity test of cognitive pretest and posttest data can be seen in Table 5**.** as follows:

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Table 5. Homogeneity Test Results of Pretest and Posttest Cognitive Data

Test Of Homogeneity of Variances					
		Levene Statistic	**df_1**	**df_2**	**Say.**
Cognitive Pretest Score	Based on Mean	0,871	1	78	0,354
	Based on Median	0,705	1	78	0,404
	Based on Median and with adjusted df	0,705	1	77,975	0,404
	Based on trimmed mean	0,798	1	78	0,375
Cognitive Posttest Score	Based on Mean	2,514	1	78	0,117
	Based on Median	2,641	1	78	0,108
	Based on Median and with adjusted df	2,641	1	74,909	0,108
	Based on trimmed mean	2,614	1	78	0,110

Based on the test results with a 95% confidence level, it was found that: 1) The significance of the homogeneity test results of cognitive pre-test scores in the control and experimental groups was 0.354 > 0.05 so that H_0 accepted;The significance of the homogeneity test results of cognitive post test scores in the control and experimental groups was 0.117 > 0.05 so that H_0 acce 2) pted.

So it can be concluded that the cognitive pre-test and post-test data in the control and experimental groups have homogeneous variance between groups.

Hypothesis Testing

After the assumption test is fulfilled, the next step is to test the hypothesis of this research, to see whether or not there are differences in cognitive, affective and psychomotor learning outcomes taught with the conventional model as a control group and the learning model. *umbrella* training-based as an experimental class. The results of testing the first hypothesis can be seen in Table 6 as follows:

Table 6. First Hypothesis Test Results

Independent Samples Test						
		t-test for Equality of Means				
		t	**df**	**Say. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Cognitive Learning Outcomes	Equal variances are assumed	6,904	78	0,000	4,475	0,648
	Equal variances	6,904	77,647	0,000	4,475	0,648

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	are not assumed					

Based on the test results with a confidence level of 95%, the value obtained is: Significance of 0.00 < 0.05, so Ho is rejected, meaning that there is a significant difference in the cognitive learning outcomes of students taught with the conventional model and the syntax learning model based on the umbrella model to improve cognitive learning outcomes. on volleyball material.

Syntax learning model based on the umbrella model to improve cognitive learning outcomes in volleyball material developed by researchers has gone through several stages, namely: 1) Preliminary Study, 2) Model Development and 3) Product Validity Test.

At the preliminary study level the activities carried out are: a) field survey, b) literature stud, c) needs analysis. Based on the results of observations in the ongoing learning process, learning in the basic volleyball skills course uses face-to-face and practical techniques. As is usually the case, basic volleyball skills courses always involve more time spent on the field practicing. Students are also usually more interested in direct practice, so theory is often put aside. In addition, due to time constraints, the delivery of theory and practice of basic volleyball skills courses is often inadequate. From literature studies through studies (Suganda & Suharjana, 2013) which explains that, lack of knowledge and limited references or reading sources regarding how Physical Education teachers teach appropriate learning models and methods, in order to support the achievement of desired learning outcomes, means that there must be new breakthroughs that develop learning models. The learning model that has been used in this course is to use a simple learning model, starting from warming up (heating), drill (training) and Closing (closing). This learning model focuses on the process of conveying material verbally from a lecturer to a group of students with the aim that students can master the subject matter optimally.

The syntax learning model based on the umbrella model to improve cognitive learning outcomes in volleyball material was developed to answer competency problems facing the world of work for college graduates in the era of globalization. The formulation of this model has characteristics that are centered on (1) students/students, (2) students are required to be active and creative, (3) students are able to solve problems from the results of the analysis carried out and produce evaluations as material for correction, (4) lecturers as expert, motivator, facilitator and guide, (5) there are problems to be researched, 6) in accordance with physical education learning objectives, (7) produce a product. Learning model umbrella Training-based volleyball courses have student-centred characteristics (student center learning). Apart from that, the learning model that the researchers developed also refers to the PJOK learning model which is often used, namely a lecturer-centered learning model using learning model steps that go through 3 stages, namely, (1) Warm-up, (2) Core, and (3) Cooling. Based on this, it is necessary to develop student-centered learning models through learning models umbrella training based on basic volleyball skills courses. Results of developing learning models umbrella which has 3 stages including Handrail, Roof and Fastening. The handle consists of a structure (Showing), The stem consists of structures (Matter, Warming Up, Exercise, Analysis, Cooling Down), and the roof consists of a structure (Evaluation) This learning model is designed to develop students' abilities in the volleyball learning process which aims to develop students' potential cognitive aspect. Learning that is designed is interconnected with each other, so that learning is not only centered on the lecturer, but on the students themselves. Learning that is designed to motivate students to think critically and be able to develop their ability to analyze, besides learning umbrella This is

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expected to make learning more interesting because the process resulting from this learning model is structured and systematic and makes students prepare the material before entering learning because there is an evaluation and showing which forces students to prepare themselves to understand the material provided by the lecturer through the RPS (Semester Learning Plan) before the lecturer provides the material in class.

The next activity is to design a learning model for preparing the initial draft of the product that you want to develop based on the data available at the preliminary study stage. The product development stage is divided into three stages, namely: preparation of the initial draft, limited trials and expanded trials. The explanation of each stage is as follows: 1) the drafting stage is the stage of identifying and creating a conceptual learning model product design and will underlie the subsequent development process. At this stage the researcher prepares an initial draft of the product that will be developed by the researcher in creating the initial learning model product. , referring to the competency standards for the basic volleyball skills course, namely that students are able to master and practice the basic skills in the game of volleyball properly and correctly, namely: 1) students are able to master and practice the basic movements in the game of volleyball, 2). Students are able to master and practice basic techniques in volleyball (including techniques passing under receive service fload, technique passing above, technique smash, technique block, technique underhand service and tennis technique service). Student success in participating in learning can be seen from the level of understanding and increasing student learning outcomes, through course competency standards that have been established through the learning process. This is in accordance with the theory put forward by (Dewi et al., 2020), (Nugroho et al., 2025), (Rudi & Arhesa, 2020) defines learning design theory as explicit guidance on how to develop and help students to learn. This learning design theoretical framework contains three variables, namely conditions, treatment (methods), and results. If a lecturer is able to apply this treatment then the resulting learning method will attract students to think creatively, the treatment in question is the delivery of learning content.

Expected achievements from implementing the learning model umbrella is to increase the usefulness of courses at the learning process stage so that they can develop cognitive, affective and psychomotor aspects that are in accordance with the physical education learning objectives themselves. Explanation of the learning model umbrella has a student-centered approach (student centre learning), in the learning model umbrella with a student-centered approach (student centre learning). Apart from the umbrella learning model based on training in volleyball courses, researchers also create learning model book products, learning textbooks, lecturer guidebooks, student guidebooks. The initial research product that has been designed is then validated by experts. Validation is carried out to obtain valid contributions and information in efforts to develop a training-based umbrella learning model. Validators are lecturers who are competent in their respective fields of expertise.

In volleyball learning, if a lecturer must be able to develop creativity, students are less interested in participating in learning because a lecturer must be able to carry out tasks and adopt learning models that can help students' problems and achieve the goals of physical education learning. After the stage of drafting a syntax learning model based on the umbrella model to improve cognitive learning outcomes in volleyball material next thing to do, 2) the limited trial stage is the stage of trialing the draft/product being developed in a small sample group, the results of this trial will be improved according to input and conditions during the field trial. After the research product has been validated and from these results it can be concluded that the research product developed by the researcher can be said to be valid, the next stage is to apply the research product to users, namely lecturers and students, in a limited

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trial (small group trial). So it can be concluded that the pretest and posttest data in the expanded trial are normally distributed. After the assumption test is fulfilled, the next step is to test the hypothesis of this research, to see whether or not there are differences in pretest and posttest scores on cognitive, affective and psychomotor aspects. From the results of testing the first hypothesis, it can be seen that obtained a significance value of 0.00 <0.05 then Ho is rejected meaning that there are significant differences between cognitive pretest and posttest. In this study, students' cognitive abilities were measured from test results using a multiple choice test by answering forty (40) questions regarding the history and basic skills of volleyball techniques. According to (Ojo & Owolabi, 2021) Cognition is a thinking process that also involves physical activity.

These findings are consistent with the results of (Endriani, Sitompul, et al., 2022) and (Marsiyem et al., 2018), who also reported significant improvement in cognitive and psychomotor domains through structured volleyball learning models. Similar research by (Pratama, 2020) emphasizes that model-based learning enhances student engagement and conceptual understanding in sports education."

Conclusion

The research titled "Syntax Learning Model Based on the Umbrella Model to Improve Cognitive Learning Outcomes in Volleyball Material" was conducted with the goal of enhancing students' cognitive abilities in learning volleyball through the application of an innovative learning model. The study compared the effectiveness of the umbrella model-based syntax learning model with conventional teaching methods by analyzing students' cognitive learning outcomes. Based on the results of statistical calculations, the control class obtained an average cognitive learning score of 30.03, equivalent to 47.50%, with a frequency of 19 students. Before the median class, the score was 4 with a percentage of 10%, while after the median class, the total frequency was 17 students, representing 42.50%. The standard deviation for the control class was 1.54. In contrast, the experimental class, which was taught using the umbrella model-based syntax learning approach, showed improved performance. The average cognitive learning score was 35.02, equivalent to 50.00%, with a frequency of 20 students. Before the median class, the score was 5 with a percentage of 12.50%, and after the median class, the total frequency was 15 students, or 37.50%. The standard deviation for this class was 1.714. The results of statistical testing with a 95% confidence level revealed a significance value of 0.00, which is less than 0.05. Therefore, the null hypothesis (Ho) was rejected. This indicates a significant difference between the cognitive learning outcomes of students taught using conventional methods and those taught using the umbrella model-based syntax learning model. In conclusion, the application of this model effectively improves students' cognitive understanding and learning achievement in volleyball material.

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