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Abstract

This study aims to identify and analyze problems lecturers and students face in developing the Blended Learning model based on Complementary Work Patterns in the rhythmic activity course for PJKR students in the 2021/2022 academic year. This study uses research from Borg and Gall through 10 stages, including: (1) Preliminary Study, (2) Research planning, (3) Initial product development, (4) Initial (limited) field trial, (5) Revision of field test results limited, (6) More comprehensive field test, (7) Revised field test results, (8) Feasibility test, (9) Revision of feasibility test results, (10) Dissemination and socialization of the final product. The population of this research is the students of the Physical Education, Health and Recreation Study Program who are taking rhythmic activity gymnastics courses in the 2021/2022 academic year totaling 115 people. The research instruments used were questionnaires, expert observations, interviews, documentation, and observation sheets. The approach used in this research is a qualitative approach used to complete the first objective, while a quantitative approach is used to reveal the second objective with a before-after experimental research design.

Introduction

The learning model is a plan or pattern used to carry out classroom learning or learning in tutorials. It includes the components of learning objectives, steps, learning environment, and classroom management. One of the known learning methods is Blended Learning. This method comes from the words Blended and Learning. Blended means mixed, and Learning means learning. Rapid technological developments now require innovation and transformation in learning. One of these innovations is blended learning (Amin, 2017). (Pratama & Mulyati, 2020) The terms online and offline learning were introduced in the current era of information technology. The blended learning model is a learning model that combines face-to-face learning (conventional) and online learning (online). The use of ICT and the development of e-learning have become the starting point for the emergence of blended learning-based learning (Aeni et al., 2017), According to Nurhayati (2021) blended learning provides opportunities for students to communicate with students and teachers while studying in the teaching and learning process.

Blended learning can also be used as an alternative to solve problems in the field of education, especially the problem of equitable access to educational information (Yuwono et al., 2022). This learning combines various technologies, strategies, and delivery methods to improve learning outcomes and student experiences (Marlina, 2020). The objectives of Blended Learning are: 1) Helping students develop better in the learning process according to their learning styles and preferences in learning, 2) Providing practical, realistic opportunities for teachers and students to learn independently, which is helpful, 3) Increased flexibility for learners by combining the best aspects of face-to-face and online instruction.

Face-to-face classes can be used to engage students in interactive experiences. The online portion provides students with multimedia content anytime and anywhere as long as they have internet access. This method can also be used in rhythmic activity courses (Herlambang, 2017). Rhythmic activity is one aspect that is within the scope of Physical Education, Sports, and Health subjects. The basic principles of rhythmic activity are rhythm, body flexibility, and continuity of movement (Muhajir, 2007). Rhythmic gymnastics can be done without tools or withheld tools, such as balls, ropes, sticks, until, and clubs. Rhythm gymnastics series can be done by walking, running, jumping, jumping, swing, and hand rotation (Yuwono et al., 2022). Rhythmic gymnastics requires the head, arms, trunk, and legs to move in harmony with the accompanying rhythm. The high and low level of movement difficulty contributes to getting the most significant value.

As for the rhythmic activity, three things must be considered, namely flexibility, continuity, and accuracy with the rhythm. Movements in rhythmic gymnastics aim to relax the body's muscles, expand joint motion, eliminate muscle injuries, and improve health and physical fitness. In rhythmic gymnastics, there are basic movements that must be mastered (both with tools and without tools), these basic movements include (1) steps, or moving one back foot to the front of the other with various variations (regular steps, balance, forward), (2) jumping, is a stepping movement accompanied by foot repulsion so that there is a body scap floating in the air, landing with one foot followed by the other (ordinary jump, horse, bouncing); (3) the posture of the body when the gymnastics stops, both for alternating combined movements and final movements with the completion of a rhythm (standing, sitting, lying down, supine sleeping); (4) step, is to step without changing the position of the feet, meaning that the front foot after landing remains in front and lands with one foot followed by the other; (5) one-arm or two-arm swing can be moved with various variations, for example left and right side, forward/backward, right to left circular, forward/backward loop; (6) twisting, is turning the body to the right or left by resting on one leg; (7) curving, is a squirming movement as if wavy with a more active hip movement. Variations or movements can bend to the right or the left; (9) twisting motion is the movement of one leg followed by the other leg in a circular direction to the left or right. The movement of the body can rotate 180 degrees or directly 360 degrees.

This study using work patterns, work pater, or group work is a teaching and learning method with a high level of active student learning (CBSA). The group work method demands much different preparation when compared to the expository teaching and learning format. For those already familiar with expository strategies, it takes time to practice using the Group Work method. Complementary work patterns are group work patterns assigned to different topics. Each group gets a topic or task that is different from the topic/task assigned to other groups. Even though each group gets a different topic/task, each topic/task is still an integral part of the overall subject matter

(subject) through reports provided by each group. Students in other groups also obtain (listen to) information about aspects of the subject matter that they do not directly encounter. These aspects or parts are connected in-class discussion (plenary) to complement each other to form a conclusion from the whole material.

Method

² This study uses research from Borg and Gall through 10 stages, including: (1) Preliminary Study, (2) Research planning, (3) Initial product development, (4) Initial (limited) field trial, (5) Revision of field test results limited, (6) Wider field test, (7) Revised field test results, (8) Feasibility test, (9) Revision of feasibility test results, (10) Dissemination and socialization of the final product (Rohmaini et al., 2020) (see Figure 1).

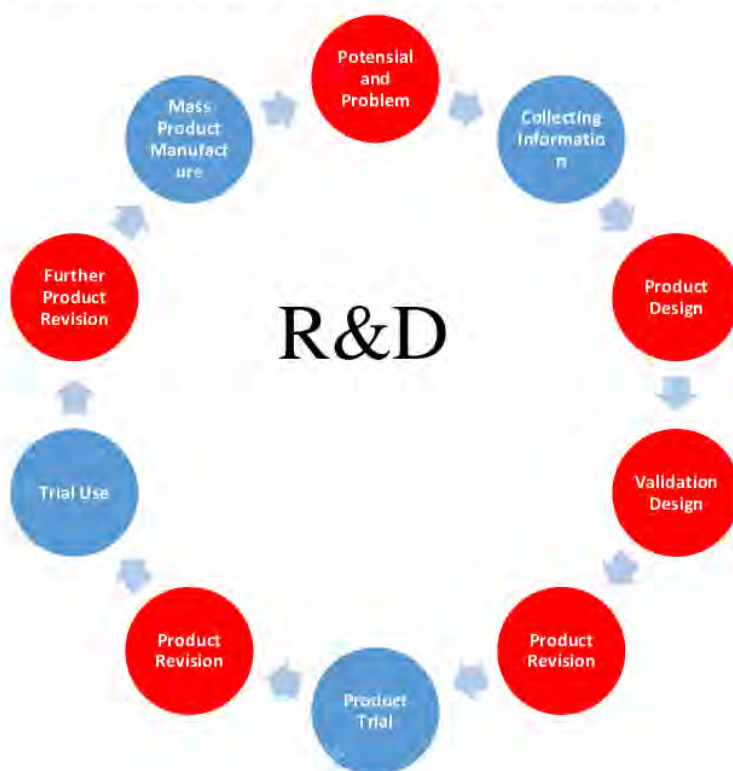


Figure 1. Development Research Chart

² This research took place at the Faculty of Sports Science, State University of Medan. This research was carried out for one semester. This study only took data on applying a blended learning model based on complementary work patterns in the physical education study program, health, and recreation, Faculty of Sports Science, State University of Medan. ⁶ The population of this research is the students of the Physical Education Health and Recreation Study Program. They are taking rhythmic activity gymnastics courses in the 2021/2022 academic year with a population of 115 people. A small sample of 25 people, a large sample of 35 people, and a comparison sample of 32 people.

The research instrument used was a standardized test of the proficient skills of karate athletes and expert observation tests, interviews, documentation, and observation sheets. Several data analysis techniques are used, including descriptive analysis and inferential analysis. Data analysis in this development research used the t-test analysis technique. The approach used in this research is a qualitative approach used to complete the first objective, while a quantitative approach is used to reveal the second objective, with a before-after experimental research design (one-Group pre-test and post-test Design) (see Figure 2).

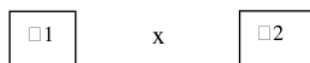


Figure 2. Experiment Design before-after (*one-group- pre-test – post-test Design*)

Results

Development of Blended Learning Model Based on Complementary Work Patterns: Draft Model Development Process

Preliminary Study

Before the learning model was developed, the research carried out observations on lecturers who taught rhythmic activity courses during the pandemic, especially those running for two years. The observation results obtained information if the learning carried out was less effective. Lecturers have difficulty carrying out learning, especially when they have started to enter the new normal. At the beginning of the new-normal period, lectures were not carried out directly 100% face to face but were carried out face-to-face 50% and 50% through the network. This learning model makes it difficult for lecturers to teach because they have to do face-to-face teaching and teach online.

Lecturers found it hard to choose the appropriate methods, strategies, and learning media to use. From the information gained from the interviews with four lecturers who teach rhythmic activity courses, the current solution is to divide the learning time. If the class has two credits, the lesson hours will divide into two sections. The first credit is for learning, and the rest will be for giving an assignment. Lecturers are replaced by teaching online with one credit remaining and assigning the same credit as an assignment. According to the lecturer, this step is not a solution. As a result, all students cannot understand the material for rhythmic activities, especially those in the network. Based on this experience, the lecturer decided that there should be a learning model that could help solve these problems.

After knowing the field conditions experienced by the lecturers and students above, the researchers took the initiative to have discussions with several lecturers of rhythmic activity courses, media expert lecturers, material expert lecturers, and expert lecturers in the course curriculum section. The FGD was conducted for two hours. From the discussion results, several important notes were obtained to solve the problems of online and offline learning. The results of the FGD can be seen in Table 1.

Table 1. FGD Results

No	Notes
1	Lecturers and students need a learning model that can be used for online and offline learning
2	The learning model can be applied simultaneously when instruction is conducted at one time.
3	The learning model is easy to use by all lecturers
4	Learning models can help make it easier for students who learn online and offline.

Based on the results of the Focus Group Discussion (FGD) above, this study plans to develop a learning model according to the needs of the lecturers.

Expert Validation

Expert validation of the product development of a blended learning model based on a complementary work pattern consisting of five lecturers. Expert lecturers who validate the product are two media experts and three material experts. This expert lecturer provides assessments and suggestions on the results of the development product of blended learning models based on complementary work patterns to make them more perfect. Based on the analysis of the validation obtained the following findings in Table 2:

Table 2. Expert Validation Results

No	Indicator	Expert	Expert	Expert	Average	Category
		1	2	3		
1	Learning Model Supporting Theory	4	4	4	4	Excellent
2	Model Development Background	4	4	4	4	Excellent
3	Model Development Goals	4	3	4	3.67	Excellent
4	Description of Learning Model	4	3	3	3.33	Good
5	Instructions for Use Model	4	4	4	4.00	Excellent
6	Learning Model Syntax	3	4	4	3.67	Excellent
7	Learning Model Support System	4	4	3	3.67	Excellent
8	Learning steps	4	4	4	4	Excellent
9	Evaluation And Assessment	4	4	4	4	Excellent

Based on the table of expert validation results using nine indicators, eight were obtained in the very good category and 1 in the good category. Based on the validation, the expert provides some notes to make the model better. Some expert notes can be seen in Table 3. Based on the results of the expert validation above, the blended learning model based on complementary work patterns was refined according to the experts' advice to be better than the developed model. The model that has been improved and suggestions from experts can be seen as follows.

Table 3. Notes on Expert Advice on Model Results

No	Expert	Suggestion
1	Yoko, S. Kom	The description of how to use the media is more detailed so that lecturers can easily use it later
2	Ricky Alfian	a. The model support system is described so that lecturers can choose and adjust later when they want to use the model for different materials b. More detailed learning steps
3		a. Instructions for using the model to be explained and linked to the objectives to be achieved in a lesson b. The syntax is given a more detailed explanation.

Small Class Trial

The developed blended learning model based on complementary work patterns was later applied in small classes to determine its effectiveness. Products that get validation by experts and valid and reliable instruments are then used for small class trials. The products are assessed in the scope of a small class twice, namely pretest and posttest (after being revised or repaired). Based on the small class trial results, the product assessment results in the small class obtained the following results in Table 4.

Table 4. Results of Small Class Rhythmic Activity Ability Assessment

No	Criteria	Pre-test		Post-test	
		Frequency	(%)	Frequency	(%)
1	Excellent	1	4	19	76
2	Good	10	40	6	24
3	Insufficient	14	56	0	0
4	Bad	0	0	0	0
Total		25	100	25	100

The results of students' abilities in rhythmic activities before and after being given learning using a blended learning model based on complementary work patterns obtained information that showed a significant difference. Most of the students' rhythmic activity abilities were classified as poor criteria at the pretest stage. This assessment is carried out on students before they are given learning using a blended learning model based on complementary work patterns.

However, after students in small classes were given learning using a blended learning model based on complementary work patterns, the results showed different results. Most of the students have good ability in rhythmic activities. Using a blended learning model based on complementary work patterns, students can carry out basic rhythmic activity movements properly according to the directions given during learning. The results of the assessment can be illustrated in Figure 3.

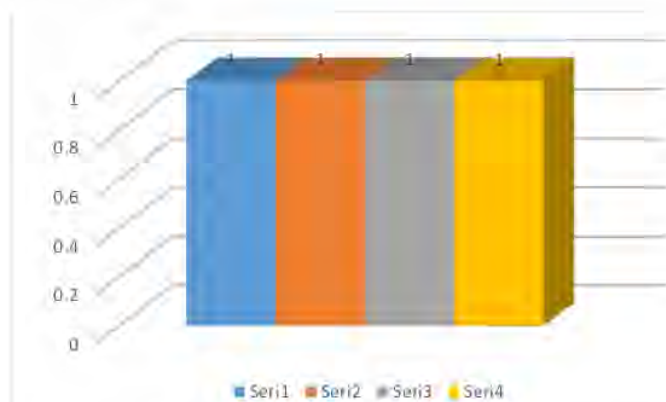


Figure 3. Results of Small Class Rhythmic Activity Ability Assessment

Big Class Trial

The product applied in small classes showed an increase in the ability of rhythmic activities owned by students before learning and after learning using a blended learning model based on complementary work patterns. The trial in a big group applied to 35 samples of students, where 18 samples took part in face-to-face learning, and 17 students took part in online learning via zoom. The assessment of student abilities was carried out twice, before the learning process and after learning, using a blended learning model based on complementary work patterns. The assessment results before and after learning are given in Table 5.

Table 5. Results of Small Class Rhythmic Activity Ability Assessment

No	Criteria	Pre-test		Post-test	
		Frequency	(%)	Frequency	(%)
1	Good	3	8.58	34	97.14
2	Sufficient	18	51.42	1	2.86
3	Insufficient	14	40	0	0
4	Bad	0	0	0	0
Total		35	100	35	100

The trials resulted in a big group of blended learning models based on complementary work patterns and obtained information that showed significant differences. The ability of students' rhythmic activity before and after learning was significantly different. At the pre-test stage, most of the students' rhythmic activity abilities were classified as poor criteria. This assessment is carried out on students before they are given learning using a blended learning model based on complementary work patterns. However, after students in small classes were given learning using a blended learning model based on complementary work patterns, the results showed different results. Most of the students have good ability in rhythmic activities. Using a blended learning model based on complementary work patterns, students can carry out basic rhythmic activity movements properly according to the directions given during learning (see Figure 4).

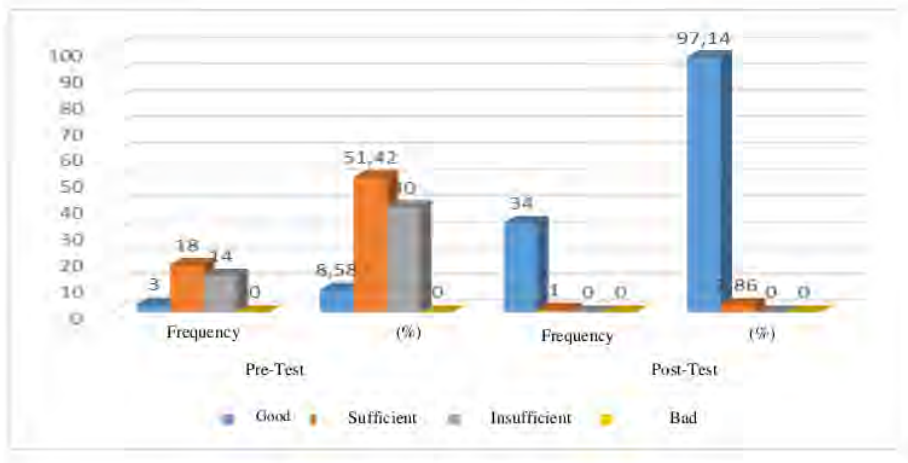


Figure 4. Results of Large Class Rhythmic Activity Ability Assessment

Final Product

The planned model then made a draft model used in the study. The draft model is a description of the planning model.

Model Instruction

The detailed steps for using the blended learning model based on complementary work patterns can be seen as follows.

- a. The user prepares the material
- b. User prepares classroom
- c. The user prepares the zoom application to be used for online learning
- d. The user installs a camera connected with a zoom of at least three cameras, with details of one camera pointing at the lecturer, one camera aiming at students in the classroom, and one camera showing the learning atmosphere in the classroom.
- e. Users make sure all equipment is running well
- f. Users manage the classroom
- g. Users check students who are in the network via zoom
- h. Learning can start

Model Syntax

The syntax of the blended learning model based on complementary work patterns is as follows.

- a. Seeking information
Searching for information from various sources of information available online and offline based on relevance, validity, content reliability, and academic clarity.

b. **Acquisition of information**

Finding, understanding, and confronting them with ideas or ideas have been in mind and then interpreting information/knowledge from various available sources until they can re-communicate and interpret ideas and the results of their interpretation using online/offline facilities.

c. **Synthesizing of knowledge**

Constructing/reconstructing knowledge through assimilation and accommodation starting from the results of analysis, discussion, and formulation of conclusions from the information obtained. Go back and interpret ideas and the results of their interpretation using online/offline facilities.

Model Support System

The blended learning model based on complementary work patterns requires several systems and equipment that must be met so that the learning process can be carried out correctly. The primary system that must be met is the existence of an internet network, and the learning model cannot be used if there is no internet network. The following system is a complete set of computers. This set consists of a laptop, a camera with high specifications (50 Megapixels), a Zoom application, and a loudspeaker. If the camera in this model works correctly, three cameras and three laptops are prepared because online learning and online learning are carried out simultaneously and in different places.

- a. Before using the model, lecturers or model users pay attention to several activities that support the learning of this blended learning model, including the following.
- b. Live Events, synchronous direct or face-to-face learning in the same time and place or the same time but different places.
- c. Self-Paced Learning, which combines with self-paced learning, allows students to learn anytime, anywhere online.
- d. Collaboration, combining collaboration, both collaboration between student educators and collaboration between students.
- e. Assessment, educators must be able to mix a combination of online and offline assessment types, both test and non-test (class projects).
- f. Performance Support Materials, ensure that learning materials are prepared in digital form and accessible to students offline and online.

Learning Method

The methods used in the blended learning model based on complementary work patterns include:

Discussion

Discussion is a scientific conversation that contains the exchange of opinions, the emergence of ideas, and testing of opinions carried out by several members of groups to seek the truth. The discussion method is an activity of regularly exchanging information, opinions, and elements of experience. The goal is to get a more precise and

thorough understanding of something in addition, to prepare and finalize joint decisions. Therefore, the discussion is different from the debate, which is nothing more than a war of words, where people compete for arguments, ideas, and persuasion abilities to win their understanding. The discussion method presents lessons in which students are faced with a problem, which can be a statement or a problematic question to be discussed and solved together. In learning, the discussion means a situation where teachers and students with other students exchange opinions verbally and share ideas and opinions.

Project Method

According to the Ministry of Education, Culture, Research, and Technology No. 146 of 2014, the project method consists of educators' activities with children, both individually and in groups using natural objects and daily activities. Furthermore, the project method is a teaching strategy that involves children learning to solve problems by collaborating with other children, each doing their part of the work individually or in small groups to achieve shared goals.

Demonstration Method

The demonstration method presents lessons by demonstrating and showing students a particular process, situation, or object, either actual or just an imitation. Apart from the method of presentation, it cannot be separated from the teacher's explanation. Even in the demonstration method, students only pay attention.

The demonstration method is a process that uses demonstrations to clarify or understand or to show how to do something to other participants. The demonstration is an effective learning method because students can know first-hand the application of the material in everyday life. The demonstration learning method presents learning by demonstrating and demonstrating a specific process, situation, or object being studied either in its tangible form or in imitation, which is shown by the teacher or other learning resources in front of all students.

Pre-test Results

Based on the student's rhythmic activity ability assessment at the pre-test stage for small and large classes, the statistical descriptions were obtained in Table 6. Based on the statistical test results above, information about the ability of students' rhythmic activities before learning with a blended learning model based on complementary work patterns is obtained. The average score obtained by students in the small class is 45.08, while in the large class, it is 46.57. The average value is not much different, indicating that the average small and large class students have the same essential rhythmic activity ability.

The lowest score obtained by the small class students also did not differ much, namely 37 for the small class and 40 for the large class. It means that students with the lowest rhythmic activity ability are still the same and not much different. The highest score is also relatively the same, where the small class scores 62 while the large class scores 64.

Table 6. Statistical Description of the Ability of Rhythmic Activity in the Pre-test Stage

Statistics			
		Small group pre-test score	Big group pre-test score
N	Valid	25	35
	Missing	10	0
Mean		45.0800	46.5714
Median		45.0000	46.0000
Std. Deviation		5.46900	5.81724
Variance		29.910	33.840
Range		25.00	24.00
Minimum		37.00	40.00
Maximum		62.00	64.00

Post-test Results

Students who have been given learning using a blended learning model based on complementary work patterns will be assessed for their ability to perform rhythmic activities again. The results of the assessment of the ability of this rhythmic activity can be described statistically given in Table 7.

Table 7. Statistical Description of the Ability of Rhythmic Activity in the Post-test Stage

Statistics			
		Small group pre-test score	Big group post-test score
N	Valid	25	35
	Missing	10	0
Mean		63.2400	65.1714
Median		63.0000	65.0000
Std. Deviation		3.89744	2.96535
Variance		15.190	8.793
Range		13.00	11.00
Minimum		57.00	59.00
Maximum		70.00	70.00

Based on the statistical test results above, information is obtained about the ability of students' rhythmic activities before learning with a blended learning model based on complementary work patterns. The average score obtained by students in the small class is 45.08, while in the large class, it is 46.57. The average value is not much different, indicating that the small class and large class students, on average, have the same essential rhythmic activity ability. The lowest scores obtained by small class students also did not differ much, namely 37 for small classes and 40 for large classes. It means that students with the lowest rhythmic activity ability are still the same and not much different. The highest score is also still relatively the same, where the small class gets a score of 62 while the big class scores 64.

Hypothesis Testing

The hypothesis is to determine the difference in the average product assessment in the pre and post-stages in the small and large classes. The paired sample t-test results are obtained as follows in Table 8.

Table 8. Hypothesis Testing

No	Group	Average	Deviation	t count	P-value
1	Pre small group	45.08	18.16	24.892	0.000
2	Post small group	63.24			
3	Pre big group	46.57	18.60	24.893	0.000
4	Post big group	65.17			

Based on the hypothesis test results, it is known that the t value for the small class is 24,892, with a p-value of 0.000. The p-value is lower than 0.05 ($0.000 < 0.05$), so it means that the hypothesis is accepted that there is a significant difference in the results of product assessment by students at the stage before and at the stage after product revision in small classes. Based on the results of hypothesis testing, it is known that the t value for the large class is 24,893 with a p-value of 0.000. The p-value is lower than 0.05 ($0.000 < 0.05$), so the hypothesis is accepted that there is a significant difference in the results of product assessment by students at the stage before and at the stage after product revision in the large class.

Student Responses to Blended Learning based on Complementary Work Patterns

Based on the student response questionnaire after participating in learning using a blended learning model based on complementary work patterns, the classification results are obtained in Table 9.

Table 9. Student Responses to the Blended Learning Model based on Complementary Work Patterns

No	Criteria	Frequency	(%)
1	Excellent	38	63.33%
2	Good	21	35.00%
3	Sufficient	1	1.67%
4	Insufficient	0	0.00%
Total		60	100

The results of the opinion questionnaire or student responses to the blended learning model based on complementary work patterns showed that most of them gave very good responses to the model. From the results of the research questionnaire, it is known that 63.33% think or respond that the learning model used is classified as very good. As many as 38 students gave the very good to the model. Responses in the good category were 35% or 21 students. There are pretty good responses, as much as 1.67%, while there are no destructive responses. The results of these responses can be illustrated in Figure 5.

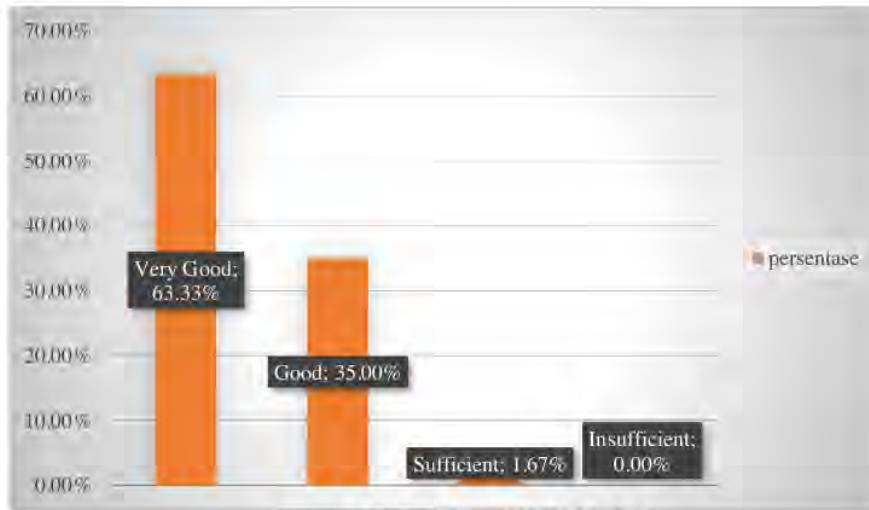


Figure 5. Student Responses to the Model

Lecturer's Response using a Blended Learning Model based on Complementary Work Patterns

The final product was then asked for a trial carried out by three lecturers with different materials but still related to the rhythmic activities of students. The following responses or assessments were obtained based on the lecturer's response questionnaire after using the blended learning model based on complementary work patterns (see Table 10).

Table 10. Lecturer Responses to the Developed Model

No	Indicator	Lecturer	Lecturer	Lecturer
		1	2	3
1	Easy-to-Use model	3	3	3
2	Models help teach	3	3	3
3	Flexible model in use	2	3	3
4	Models can solve existing problems	3	3	2
5	Attractive model for students to participate in learning	3	3	3
Total		14	15	14
Maximal Score		15	15	15
Percentage %		93.33%	100.00%	93.33%

The responses of lecturers who have used blended learning models based on complementary work patterns show that three lecturers all responded that the model developed was very good and could be used for learning practices on rhythmic activity material. Lecturers can use the easy model to carry out online learning and online or face-to-face learning.

Discussion and Conclusion

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The blended learning model is a learning model that combines face-to-face learning (conventional) and online learning (online) (Altunisik & Akturk, 2021a; Demirer & Sahin, 2013; Ye et al., 2021). This learning combines various technologies, learning strategies, and delivery methods to improve learning outcomes and student experience (Altunisik & Akturk, 2021b; Akturk et al., 2015; Chine, 2022; Noroozi et al., 2021; Or, 2022; Tukul, 2020). The research results are a product of developing a blended learning model based on complementary work patterns. Based on the research results, it is known that the model that has been developed is effective for student learning in rhythmic activity courses. The learning model used is statistically proven to increase the ability of rhythmic activity in students. The research shows that technology and other variables can be considered in sport education (Atilgan & Tukul, 2021; Atilgan & Tukul, 2022; Karagöz et al., 2022). The model is tested using small classes and large classes. From the results in the two classes, statistically, there is a significant difference in the average ability of rhythmic activity.

Statistically, the hypothesis test of the blended learning model based on complementary work patterns obtained a significant value of 0.000, which means that the model can significantly increase the ability of rhythmic activity in students. The ability of rhythmic activities, fundamental movements that students have before being given learning using a blended learning model based on complementary work patterns, shows a significant increase. Lecturers can effectively use this learning model. The results are consistent with the previous works (Calderón et al., 2021; Chaloupký et al., 2021; Priyambada et al., 2022; Syafi'i et al., 2021). The study results revealed that the model was tested using three rhythmic lecturers. The lecturers' responses show that the model developed is a blended learning model based on complementary work patterns to help lecturers in teaching. The perceived problem of lecturers, namely doing learning on the network and outside the network, is experiencing problems. There are already solutions, and this model is effectively used to overcome these problems. In addition, this model can be used on other materials and is flexible in its use.

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Based on the results of the study, in this study it can be concluded as follows:

- 10
1. A blended learning model based on complementary work patterns follows the needs formulated in the focus group discussion (FGD) to provide learning solutions in networks and learn outside the network.
- 11
2. The blended learning model based on complementary work patterns can effectively improve students' rhythmic activity abilities.
- 11
3. Students gave very good responses to the results of developing a blended learning model based on complementary work patterns.
- 11
4. The blended learning model based on complementary work patterns makes it easier for lecturers to provide learning, especially in online and off-network learning.

This learning model can be developed according to teaching needs by existing courses in hybrid learning. Suggestions for further research can be added by developing learning media that can also be accessed in hybrid learning. It is even more helpful in perfecting the implementation of blended learning models based on complementary work patterns using digital media.

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