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Validity of the Rotation Type Blended Learning Model Using the M-Learning Application for Student Athletes of Student Sports Education and Training Center

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Abstract

This study evaluated a rotational blended learning model using an M-Learning app for athlete students. The goal is to provide flexible learning adapted to their schedules and academic needs. The research uses Research and Development methodology with the ADDIE model phases: Analysis, Design, Development, and Implementation. Data were collected via expert validation and student questionnaires. Quantitative analysis utilized a four-point Likert scale to measure model feasibility. Results indicate high feasibility with expert ratings of 97.36% for the model, 87.89% for the media, and 94.14% for the material. This confirms the model's excellent validity. The findings suggest the model is an effective, suitable learning medium for athletes managing both training and academics. Future work should explore broader implementation and continual improvement.

Keywords: Blended Learning, M-Learning Application, Student Athletes

INTRODUCTION

Sports education plays an important role in student development today. It shapes students as athletes and builds their sports knowledge regularly. National sports performance depends on effective coaching programs annually . Schools provide training to establish a strong foundation yearly. Governments create training programs to support athlete development quarterly. The Youth and Sports Office manages these programs continuously (Herliyanti, S., et al., 2024). The Student Sports Education and Training Center supports high school athlete training monthly. It nurtures talented student-athletes through structured programs weekly. The center was established by the Ministry of Youth and Sports in recent years. These efforts improve athlete skills and sports performance over time (Lau, P., & Lee, J., 2024).

Student-athletes have two main roles in sports and academics today. They train many hours each week. They also study regularly to get good grades. Balancing sports and academics is difficult (Garcia, P., & Smith, K., 2025). Time limits often reduce their academic success. Their critical thinking skills sometimes decline. Flexible learning models are important now. Traditional education often limits their study time. Many student-athletes miss class because of sports competitions. Schools need new ways to support their learning needs.

Rotational blended learning shows promise in education today. It combines classroom and online learning regularly. Few studies focus on student-athletes currently. Student-athletes need special learning models due to unique schedules. Current models do not fully solve flexible time management issues. Most research studies target general students

frequently. Few explore applications like M-Learning recently. Existing models miss integration tailored to athlete needs. Schools struggle adapting blended learning for athlete students (Caldwell, B., 2015). New approaches are necessary to improve learning outcomes.

This study uses a rotational blended learning model today. It uses an M-Learning app with features like attendance and assessments. The app targets student-athletes at the Sports Education and Training Center. This model allows learning anytime and anywhere regularly. The iterative model guides the app's development continuously. It fully accommodates athlete schedules. The study combines digital tools and face-to-face teaching. This approach is new by merging rotation blended learning and M-Learning (Sung, Y. T., Chang, K. E., & Liu, T. C., 2016). The goal is to improve academic and athletic success simultaneously. The study addresses time management and content access issues.

Innovative learning models are important for student-athletes today. They help students balance both sports and academics regularly. Using technology increases student engagement and learning flexibility. This study validates a new learning model's effectiveness recently. It provides useful insights for teachers and coaches continuously. Similar models have improved learning outcomes in other settings before. The findings help guide future use of technology in sports education. Ongoing evaluation keeps the model updated with new needs. This progress supports improving national sports performance yearly. It encourages better integration of academics and athletics for students (Marr, C., et al., 2023).

METHOD

This study took place at a public senior high school in Serang, Indonesia, in 2025. Researchers used the ADDIE development model for this study (see Figure 1). ADDIE includes five phases: Analysis, Design, Development, Implementation, and Evaluation. The study focused only on the Implementation phase this time. The ADDIE model improves learning design and execution in education nowadays. Researchers showed ADDIE's phases in a figure for clarity. The model guides the systematic development of learning experiences. The use of ADDIE is growing in research on blended learning (Wilson, R., Thompson, J., & Lee, K., 2023).

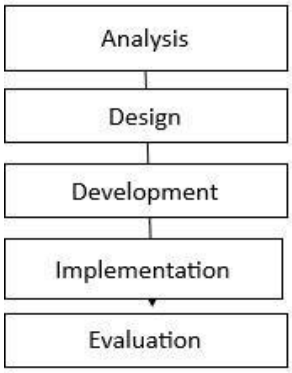

Figure 1. R&D Procedure Using the ADDIE Model

In the analysis phase, researchers identified opportunities and challenges at the Serang school this year. They focused on the need for blended learning models for student-athletes. Data came from students, teachers, and school officials. Researchers interviewed instructors and athlete students at the Training Center directly. They used a Google Forms survey to gather more information. The analysis followed methods using purposive sampling (Brown, P., 2015). This sampling method targeted specific traits relevant to the study's aims. Researchers ensured data reflected the real needs of participants. It describe purposive sampling in education research. The analysis helped plan the design phase effectively.

The design phase created a conceptual framework during 2025. This framework shaped the overall learning model. Next, the development phase turned the framework into a working product. Researchers prepared the product for deployment. Validation happened during development with three experts: model, media, and material specialists. The experts judged the product's educational and technical quality (Nenov, V. & Djambazoff, J., 2023). It emphasized using experts in instructional development. This process ensured the product met educational and pedagogical standards. It explained this in similar research. This validation improved the model before field testing.

The implementation phase had two trials in 2025: small scale and large scale. Researchers used purposive sampling again for participant selection (Nestiadi, M., 2024). They chose samples based on predetermined criteria, as explained also support this approach for relevant participant selection. Ten Grade X athlete students joined the small scale trial. All Grade X athlete students participated in the large scale trial. This selection method ensured a focused study with suitable participants. The trials tested the practicality of the blended learning model. Results helped researchers understand model effectiveness. This phase was critical before wider application.

Researchers used multiple data collection methods in 2025. These included interviews, validation sheets, documentation, tests, observations, and questionnaires. Descriptive analysis

compared validation sheet scores to model features. Experts' feedback guided ongoing product improvements. It explain how descriptive analysis helps in educational studies. Quantitative data used scores from 1 to 5. Researchers converted scores to qualitative data using a Likert scale. Analysis focused on meeting validation requirements. Proper analysis ensured the model's usability and effectiveness. This method supported trustworthy conclusions about the learning model (Okesola, A. et al., 2020).

RESULTS AND DISCUSSION

The validation of the rotational-type blended learning model started during its development phase. Researchers created the model's features and defined the learning rotation within the blended learning strategy. Three experts conducted a logical validation of the model. These experts included a model specialist, a media specialist, and a material specialist. The model was improved continuously based on the experts' extensive feedback. The updates included changes to the model's name. The learning procedure was also modified over time. The media used for both offline and online learning parts were adjusted. Researchers also changed the selection of learning resources. These updates ensured the model met educational standards effectively.

Characteristics of the Rotational-type Blended Learning Model for Student Sports Education and Training Center Athletes

The rotational-type blended learning model for Student Sports Education and Training Center athletes involves many learning activities. These activities happen at different learning stations. Stations include whole-group instruction and small-group instruction. Students also do peer-to-peer activities and assignments. Each student works on laptops or mobile phones. Students are divided into small groups. Some groups have teacher-led sessions. Others do individual or group assignments (Munir, M, 2010). Some use mobile media, the internet, or computers. The learning rotates within one classroom on a set schedule.

Learning alternates between online and face-to-face classes. Groups can be whole classes or smaller groups. During online sessions, students access materials on the internet. Teachers guide them through assignments, skill building, and projects. This method lets students learn independently. Students do not feel pressured to present to others. In face-to-face sessions, students meet teachers directly. Teachers introduce new topics or deepen online lessons. The model supports different learning styles and preferences. It balances independent study and teacher support effectively (Allen, I. E., 2007).

The characteristics, advantages, and challenges of the rotational blended learning model are as follows:

Characteristics of the Rotational-Type Blended Learning Model

1. Students rotate through stations on a fixed schedule.
2. At least one station is dedicated to online learning.
3. Other stations may include activities such as small-group or whole-class instruction, group projects, individual instruction, and written assignments using traditional methods (e.g., pencil and paper).

Advantages of the Rotational-Type Blended Learning Model

1. The model requires only minor adjustments to teacher contracts, classroom facilities, or classroom design.
2. It enables teachers to work with smaller groups of students, thereby enhancing personalized learning.
3. It addresses issues of high student-teacher ratios by allowing more focused attention on individual students.
4. The model encourages the incorporation of project-based learning as a supplement to online learning stations.

Challenges of the Rotational-Type Blended Learning Model

1. Teachers need to acquire new skills and adapt to a more diversified teaching approach.
2. An efficient learning management system (LMS) is essential for aligning students with appropriate online materials and for generating reports that teachers can use for follow-up actions.
3. Online learning stations must be designed to allow students to work independently with minimal adult supervision.

Syntax of Rotational-type Blended Learning Model for Student Sports Education and Training Center Athletes can be seen in Table 1.

Table 1. Syntax of Rotational-type Blended Learning Model for Student Sports Education and Training Center Athletes

No	Syntax of Rotational-type Blended Learning Model	Learning Activities
1	Prepare	- Designing a rotation station consisting of four stations: a teacher-led station, an offline station, an online station, and a collaboration station. The design of these stations is tailored to meet the needs of the athlete students. - Preparing both online and offline learning media for the blended learning model.

No	Syntax of Rotational-type Blended Learning Model	Learning Activities
		- Scheduling offline and online classes for efficient learning management. - Dividing the athlete students into online and offline groups to ensure a balanced distribution of resources and learning activities.
2	Presentation	- Introducing the rotational blended learning model to Student Sports Education and Training Center athlete students, explaining the learning objectives, and demonstrating how to combine online and offline programs effectively. - Explaining the patterns of online and offline learning to ensure that students understand the structure of the blended learning approach. - Providing clear instructions on how to use the learning media utilized in online activities.
3	Demonstration	- Guiding athlete students in using the designed M-Learning media, offering hands-on assistance to facilitate learning. - Assisting students in accessing materials via the M-Learning media developed specifically for the course.
4	Practice	- Providing opportunities for athlete students to practice using the M-Learning media, incorporating several applications used during online learning sessions. - Guiding students in accessing various offline and online learning resources, encouraging them to present their findings during offline class sessions. - Offering guidance to ensure students gain a correct understanding of the material delivered in both online and offline classes. - Supporting the presentation group in preparing their presentation, facilitating the discussion group in a question-and-answer session, and encouraging engagement through exercises. - Offering assistance and guidance during group assignments, ensuring that students collaborate effectively and learn from one another. - Monitoring and guiding the learning process of athlete students at each rotation station change, ensuring that both online and offline groups stay on track.
5	Evaluation	- Assessing the performance of online and offline group assignments to evaluate student learning outcomes. - Assessing offline group presentations to evaluate the effectiveness of group collaboration and the presentation of ideas. - Assessing student tests carried out in both online and offline formats, measuring individual learning progress.

Validation Results of Rotational-Type Blended Learning Learning Model

To assess the benefits and drawbacks of the rotating mixed learning model created for athletes at the Student Sports Education and Training Center, a feasibility test was carried out.

The purpose of this evaluation was to draw descriptive findings about how well the model applied to the learning process. The feasibility test made sure that the rotational-type blended learning model, which was used with the M-Learning application, was verified as an appropriate learning framework by including subject matter experts. Through their involvement, the experts offered unbiased assessments of the instructional materials, the M-Learning application, and the learning model, confirming their suitability as instruments and resources for meeting the academic demands of student athletes.

Assessment Aspects

The assessment process encompassed three categories of feasibility tests: the feasibility test for the learning model, the feasibility test for the learning materials, and the feasibility test for the learning media. Each category of feasibility test was conducted based on specific assessment aspects designed to align with their respective objectives and focus areas. The detailed aspects evaluated for each test are presented in Table 2, Table 3, and Table 4.

Table 2. Aspects of the Assessment of the Learning Model Feasibility Test

Assessment Aspects	No	Assessed Aspects
Supporting Theories of Learning Models	1	Theory is following the learning objectives to be achieved
	2	Theory is following the classroom context and the material being taught
	3	Theory can be implemented by teachers easily and efficiently
	4	Theory is able to stimulate active student involvement in the learning process
	5	Theory is adjusted to the needs and learning styles of students
Background of Learning Model Development	6	Background in accordance with the learning objectives to be achieved
	7	Understand the background, prior knowledge, abilities, interests, and needs of students
Objectives of Learning Model Development	8	Development objectives are relevant to the curriculum and learning context
	9	Specific and measurable development objectives
	10	Learning models are following individual needs and different learning situations
	11	Learning objectives clearly describe what students want to achieve after completing the learning. This includes the knowledge, skills, and attitudes that students are expected to have
Description of Learning Model	12	Learning methods with specific learning strategies
	13	Assess and measure student understanding
	14	The learning model used is cooperative, a description that includes how students work together in groups, share knowledge and solve problems together
Syntactic of the Learning Model	15	Learning materials must be relevant, accurate, and following learning objectives both online and offline
	16	The extent to which digital technology is used in learning. This includes

Assessment Aspects	No	Assessed Aspects
		the use of online platforms, applications, and other technological devices.
	17	Students can easily access learning materials, both online and offline, and carry out learning according to a flexible schedule.
	18	The level of interactivity in learning, such as the possibility for students to participate, collaborate, and communicate with instructors and fellow students
Social System Learning Model	19	Students engage in social interaction and collaboration in a blended learning environment.
	20	Teachers support and guide students in a blended learning environment. Instructor involvement in discussions, providing feedback, and facilitating online learning is assessed.
	21	Learning models support effective social interaction, including the technology used
Learning Model Support System	22	Applied in the learning context, including the teaching strategies used
	23	Use of supporting technology such as e-learning platforms, software, and other digital tools
	24	Availability of teaching materials, materials, and other resources that support learning, both in print and digital form
	25	How learning management is organized, including planning, implementation, and supervision
Use of Learning Approach	26	Learning materials include a combination of online and face-to-face learning. This aspect is important to ensure a balance between online and offline components
	27	Flexible time and place in learning that allows students to access materials anytime and anywhere
Learning Steps	28	Implement a rotation model appropriately. During face-to-face sessions, focus on discussion, collaboration, and activities that encourage deep understanding. During online sessions, students can access materials, answer questions, or participate in online discussions
Evaluation and Assessment	29	Use of formative evaluation during the rotation learning process to identify student needs
	30	Evaluate the learning process, assessment of the overall blended learning process, including improvements that may be needed
Desired Learning Outcomes	31	Students can understand the learning materials delivered both through online and face-to-face components
	32	Students actively contribute to online discussions or face-to-face activities
	33	Students are able to collaborate with their peers in the learning environment, both online and offline
	34	Students' understanding of the concept of rotation in the blended learning model
	35	Students are independent in managing their learning time, so that their ability to manage time is also an aspect that is assessed.

Table 3. Aspects of the Assessment of the Feasibility Test of the Learning Meter

Assessment Aspects	No	Assessed Aspects
Material Relevance	1	Suitability of material with KI and KD
	2	Clarity of formulation of learning objectives
	3	Suitability of material with indicators
	4	Suitability of material with learning objectives
	5	Truth of material concept reviewed from scientific aspects
Material Organizing	6	Clarity of material delivery
	7	Systematics of material delivery
	8	Interesting material
	9	Completeness of material
	10	Clarity of images
Evaluation or Practice Questions	11	Suitability of evaluation with theme and learning objectives
	12	Clarity of work instructions
	13	Question variations
	14	Question difficulty level
Language	15	Accuracy of terminology use
	16	Ease of understanding material flow
Effects on Learning Strategies	17	Use of teaching modules according to students' learning abilities
	18	Support of teaching modules for student independence
	19	Ability of teaching modules to improve students' understanding
	20	Ability of teaching modules to improve competency

Table 4. Aspects of the Assessment of the Learning Media Feasibility Test

Assessment Aspects	No	Assessed Aspects
Design of Teaching Materials for M-Learning Application	1	The design of the M-Learning application is attractive
	2	The design of the M-Learning application is in accordance with the material of the rotation type blended learning model
	3	The cover of the M-Learning application is in accordance with the concept being studied
Display	4	The order of display on the menu is clear and describes the contents of the activities being studied
	5	The use of the M-Learning application is very easy so that it is not confusing when students are doing the learning process
	6	The selection of background colors, letters, and numbers on the layout is correct
	7	The images contained in the M-Learning application are clearly legible
	8	Quality M-Learning application
	9	The image size is symmetrical so that it can be seen clearly
	10	The suitability of the application to be applied to the rotation type blended learning model
	11	Images are relevant to the content
	12	The selection of easy-to-read fonts

Assessment Aspects	No	Assessed Aspects
	13	The balance of text size on each menu displayed is easy to read
	14	Placement of words is easy to read
	15	The number of lines in the text is not close together so that it is clearly visible and legible
Language	16	Writing according to English language rules
	17	Sentence writing is easy to understand
	18	The use of language does not cause ambiguity
	19	The language is easy to understand so that it can attract students' interest in reading
	20	The use of word terms is in accordance with the language dictionary

Testers used the M-Learning app while responding to statements. The statements measured the success of different assessment aspects. The feasibility test included various elements. Researchers assessed the supporting theory and background. They evaluated development objectives and descriptions. The model's syntax and social system were checked. Support system and learning approach were included (Adi, S., & Fathoni, A. F., 2020). Learning steps and evaluation methods were tested. Expected learning outcomes were reviewed carefully. These aspects ensured a complete model assessment .

The learning materials also underwent a feasibility test. Researchers evaluated material relevance and organization. They checked evaluation questions and language quality. Learning media's design and display were tested in the app (Choque-Soto, G. A., & Sosa-Jauregui, G., 2023). Teaching material language was also assessed. These features ensured the app met user needs. Each aspect was essential for measuring success. Field experts performed all tests thoroughly. They used a Likert scale from 1 to 5. Table 5 shows the result classifications clearly.

Table 5. Response Classification

Responses	Score
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

Assessors expressed their views more accurately. Higher scores showed stronger support for the application's viability. Lower scores indicated disagreement with its feasibility. Researchers analyzed the scores to judge the application's success. They interpreted accomplishment percentages descriptively. They evaluated both overall and specific parts of the application (Chen, I.-J., & Tseng, P.-H., 2023). The results appear clearly in Table 6.

Table 6. Achievement Percentage Classification

Achievement Percentage	Interpretation
20% - 39,99%	Very Not Feasible
40% - 59,99%	Not Feasible
60%	Doubtful
60,01% - 80%	Feasible
80,01% - 100%	Very Feasible

The achievement percentage is based on response classifications in the table. Researchers considered the value of each response. They calculated response values to interpret eligibility descriptively. Neutral answers result in 60% achievement, indicating 'Doubtful' feasibility. If responses are mostly Disagree or Strongly Disagree, achievement falls below 60%. This means the model is Not Feasible. Agree responses yield 80% achievement, showing Feasibility. Agree to Strongly Agree responses give more than 80% achievement, meaning Very Feasible (Panigrahi, R., Nihar, K. L., & Singh, N, 2024). Results are shown in Table 7. Figures 2, 3, and 4 display achievement percentages for each test.

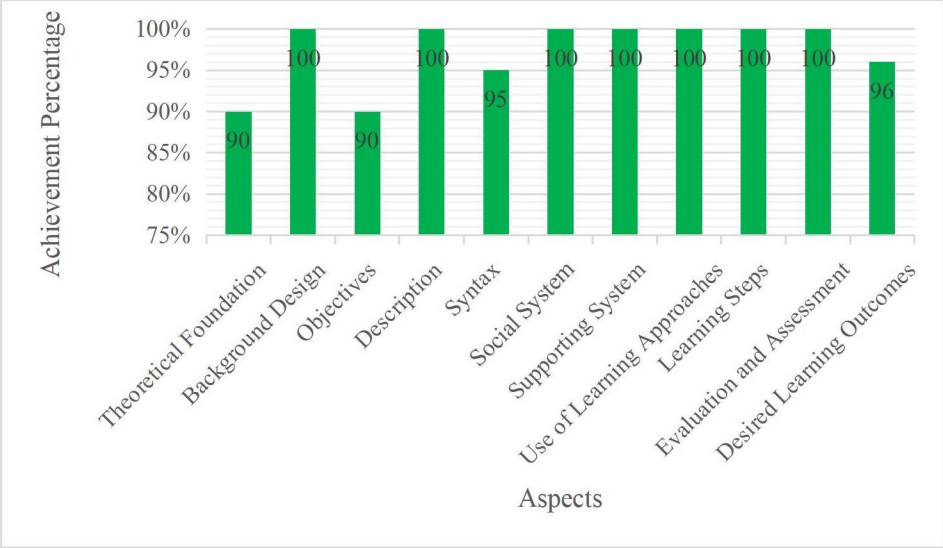

Figure 2. Percentage of Achievement in the Learning Model Feasibility Test

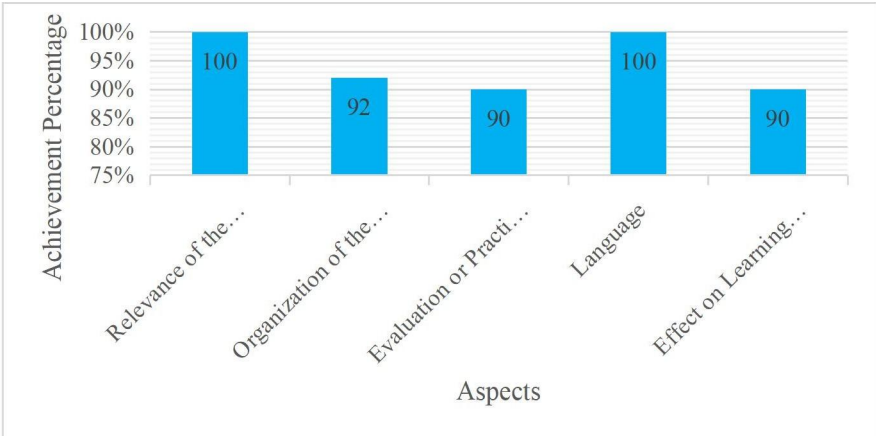

Figure 3. Percentage of Achievement in the Learning Material Feasibility Test

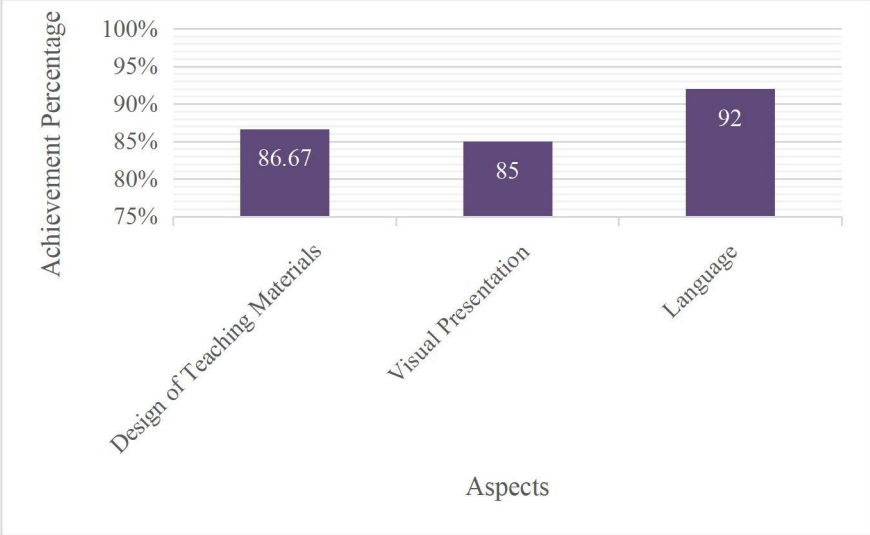

Figure 4. Percentage of Achievement in the Learning Media Feasibility Test

Table 7. Interpretation Results of the Feasibility Test

Assessment Aspects	Assessed Aspects	Interpretation
Learning Model	Supporting Theory of Learning Models	Very Feasible
	Background of Learning Model Development	Very Feasible
	Objectives of Learning Model Development	Very Feasible
	Description of Learning Models	Very Feasible
	Syntaxmatics of Learning Models	Very Feasible
	Social System of Learning Models	Very Feasible
	Supporting System of Learning Models	Very Feasible
	Use of Learning Approaches	Very Feasible
	Learning Steps	Very Feasible
	Evaluation and Assessment	Very Feasible
	Desired Learning Outcomes	Very Feasible
Learning Material	Relevance of Materials	Very Feasible
	Organization of Materials	Very Feasible
	Evaluation or Practice Questions	Very Feasible
	Language	Very Feasible
	Effects on Learning Strategies	Very Feasible
Learning Media	Design of M-Learning Application Teaching Materials	Very Feasible
	Appearance	Very Feasible
	Language	Very Feasible

This study shows the rotational-type blended learning model with M-Learning app is effective. Experts gave high validity scores: 97.36% for the model. The medium received 87.89% validity. Content validity was 94.14%. These ratings prove the model is practical and suitable for student-athletes. The blend of online and offline learning helps customize the experience. This is important due to athletes' busy schedules. The model better supports student-athletes' dual demands. Learning stations include teacher-led, online, offline, and group work. The variety meets different learning preferences. This approach improves academic success and understanding (Liu, Y., & Strom, P., 2024).

The M-Learning app enhances learning flexibility anytime and anywhere. Students can access learning resources remotely. This helps athlete students manage study and training better. The app enables self-paced learning for each student. Technology integration supports personalized education. Student-athletes benefit from this model the most. The model supports balancing education and sports obligations. Teachers and students gave positive feedback in trials. The model shows promise for other educational settings (Gusmawan, A., 2020). It addresses athlete students' unique challenges effectively.

There are challenges in applying this blended learning model. Teachers must adapt to new instructional methods. They need skills to manage blended learning environments. The technology's reliability affects success. Internet quality and app performance matter greatly. A strong Learning Management System (LMS) is necessary. LMS helps monitor students and match learning materials (Bullock, E., & De Jong, M., 2013). Without it, learning may become fragmented. Student motivation might weaken without organized resources. Future research should study the model's long-term academic impact.

CONCLUSION

The rotational-type blended learning model combined with the M-Learning application is highly effective for student-athletes. Experts gave high validity scores: 97.36% for the model, 87.89% for the medium, and 94.14% for the content. The model meets the specific needs of student-athletes well. This learning method balances online and offline components flexibly. Students can manage their academic and athletic responsibilities better. The model divides classes into teacher-led, online, offline, and group learning stations. This approach supports different learning preferences and styles. It encourages both individual and collaborative learning. Student academic success improves with this model. The M-Learning app allows anytime and anywhere access to learning resources.

Challenges remain in implementing the model. Teachers need to adapt to new teaching techniques. They require skills to use technology effectively. Reliable technology infrastructure is crucial for success. Poor internet access can hinder the model. A strong Learning Management System (LMS) is necessary to track progress. LMS also helps match students with proper materials. Without LMS, learning may become disorganized. Feedback shows strong support from teachers and students. Future research should explore long-term academic impact and adaptability of this model.

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