

Improving Physical and Recreation Health Education Competence Through Android-Based Teaching Media in Rhythmic Activities

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ARTICLE INFO

Keywords:

Android – Based;
Rhythmic Activity;
Teaching Media

Article history:

Received 2023-04-29

Revised 2023-12-17

Accepted 2023-12-31

ABSTRACT

This study seeks to evaluate the impact of Android-based teaching tools on enhancing the skills of Physical Health And Recreation Education students, particularly in rhythmic activity courses for the upcoming academic year 2022/2023. This study follows the research conducted by Borg and Gall across 10 stages. The research will be conducted at the Faculty of Sports Science, Universitas Negeri Medan. This research was conducted over one semester, specifically from May to June 2023. This study focuses on students of the Physical Health And Recreation Education programme who are enrolled in a rhythmic activity gymnastics course during the fifth semester of the 2022/2023 academic year, totaling 115 students. A modest sample size of 30 students, contrasted with a more substantial sample of 50 students. Conducting data collection involves distributing questionnaires to small samples, large samples, and comparison samples, as well as consulting material experts and learning media experts. Based on the statistical analysis, the trial using an android-based media for rhythmic gymnastics demonstrated a significant improvement in students' competence, with a p-value of 0.000. Graduation competencies in rhythmic gymnastics for students, particularly the fundamental movements they possess prior to utilising an android-based rhythmic gymnastics learning tool, demonstrate a notable improvement. Lecturers are adept at utilising teaching media to enhance learning.

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1. INTRODUCTION

There have been significant advancements in education across different areas of learning, such as facilities, media, models, strategies, and technologies to aid educators and students. Engaging in learning activities involves interactions between educators and learners to accomplish educational objectives (Arsyad, 2019). Activities conducted here are student-centered as they enhance the meaningfulness of the learning process. Hence, student engagement in the learning process holds significance as it reflects their grasp of knowledge and its practical application. It is crucial to engage

all elements in the educational journey, which includes leveraging information technology for learning purposes (Ramadhan, 2021).

Engaging in rhythmic activities at elementary schools is designed to enhance rhythm sensitivity and offer students the opportunity to express themselves through dance movements (Bonacina et al., 2019). Three different types of dance can be taught to students: singing dance, folk dance, and creative dance (Ismail et al., 2021). Exploring rhythmic movement skills and the art of rhythmic movement, along with fostering knowledge related to positive values, is essential. When learning, the emphasis is on the alignment or precision of movement and tempo. Elementary school, rhythmic activity learning, can be categorised into two types: standard structured rhythmic activities and free structured rhythmic activities (Prima et al., 2018).

Rhythmic activity learning in primary schools can be categorised into two types: standard structured rhythmic activities and free structured rhythmic activities (Bonacina et al., 2019). Engaging in rhythmic activities can enhance students' rhythmic abilities. Rhythmic activities are performed to express artistic beauty through movement synchronised with rhythmic music or spontaneous physical activity. Rhythmic motion or activity involves flexibility, continuous movement, and accurate synchronisation with the music's rhythm (Suharjana, 2010). Many teachers struggle to incorporate rhythmic activity learning, often finding the topic too challenging and choosing not to teach it. The issue escalates as teachers are discovered to be less proficient in creating learning models that cater to various student domains (Herlambang, 2017). Challenges include the absence of technology such as tape recorders, cassettes, flash discs, and electricity for rhythmic activity learning, as well as the use of the playground. Additionally, rhythmic activity learning is provided in the form of Physical Fitness. Gymnastics is a physical sport accessible to the general public, but many pupils struggle with complex moves, especially when performed to fast music with alternate sequences. (3) The teacher's limited movement vocabulary and concerns about making mistakes in front of students, (4) Rhythmic activities taught in schools do not reflect the cultural elements of the Java region, and (5) The rhythmic activities offered have not enhanced students' rhythmic skills. Rhythmic and dance activities share a commonality in that they both involve combining movement with music. Traditional dance is an artistic expression of human longing for beauty within the cultural framework of the group that practices it. Traditional dance conveys signals from the community through knowledge, ideas, beliefs, values, and conventions.

Android's success is closely tied to open source, providing developers with a cost-free platform to create their own applications. Numerous past research has explored the different advantages of Android, including the development of gymnastics-focused learning materials for Android. Pratama and Mulyati (2020) In the age of information technology, the concepts of online and offline learning have emerged. Online learning refers to education conducted over the internet, serving as an alternative to traditional in-person learning. An example of what is known as "offline" or "off-campus" learning would be an instructor providing students with hardcopy assignments to do outside of class time rather than in-person interactions. Usman (2019) states new culture centered on science and technology, particularly Information and Communication Technology (ICT), whose primary manifestation is the internet, is quickly taking shape around the globe. This includes a shift towards knowledge-based business activities, or knowledge-based business enterprises, and a society that is more grounded in science.

In a study conducted by Herlambang (2017), it was discovered that discussing rhythmic activity falls under the subject of physical education, sports, and health. Engaging in rhythmic activities involving a variety of materials, such as aerobic gymnastics, is a unique series of rhythmic aerobic dance movements. This type of material is not commonly included in physical education curriculums, possibly due to some teachers lacking proficiency in these basics. Enhancing the writing can involve teacher training programmes for implementing rhythmic activities, fundraising initiatives for acquiring equipment, and curriculum enhancements to include cultural elements. Not only will this bring attention to the problems, but it will also offer solutions to tackle them.

Based on the results of observations made by researchers at Universitas Negeri Medan and information obtained from the Faculty of Sports Science lecturers in March 2022, researchers observed that there were still many students who did not understand the technique of rhythmic activity gymnastics properly and correctly in learning rhythmic activities. While the competing demands of each material must be carried out, so that supporting media innovation is needed in learning in the competency objectives of graduates, therefore the researchers researched Physical Health And Recreation Education students in the semester II class of 2022/2023 to develop an Android-based learning model in rhythmic activity courses in the semester of Physical Health And Recreation Education students II academic year 2022/2023. This analytical writing explores the challenges faced by teachers in implementing rhythmic activities in elementary schools and proposes an Android-based learning model as a solution to enhance students' rhythmic skills

2. METHODS

The study employs Borg and Gall's research methodology consisting of 10 stages: (1) Preliminary study, (2) Research planning, (3) Initial product development, (4) Initial field trials (limited), (5) Revision of limited field test results, (6) Wider field trials, (7) Revision of field test results, (8) Due diligence, (9) Revision of due diligence results, (10) Dissemination and socialisation of the final product (Rohmaini et al., 2020).

This study focuses on 115 students enrolled in the Physical Health and Recreation Education programme who were taking a rhythmic movement gymnastics course during the fifth semester of the 2022/2023 academic year. The small sample consists of 25 students, the large sample has 35 students, and the comparative sample includes 32 students. The research will be conducted at the Faculty of Sports Science, Universitas Negeri Medan. The research will be conducted throughout one semester, specifically from May to June 2023. This study focuses solely on the implementation of the Android-based learning paradigm in the health and recreation physical education study programme at the Faculty of Sports Science, Universitas Negeri Medan.

The research instrument utilised is a standardised test assessing students' gifted abilities in executing rhythmic activity gymnastic motions, together with expert observation tests, interviews, paperwork, and observation sheets. Data collection is conducted by distributing questionnaires to small samples, big samples, and comparison samples. Data collecting is conducted on subject matter experts and instructional media specialists.

Various data analysis approaches are utilised, such as descriptive analysis and inferential analysis. The development investigation utilised the T-test analysis approach for data analysis. This study employs a qualitative strategy to achieve the first objective and a quantitative approach to address the second objective, utilising a before-after experimental research design (one-group pre-test and post-test design).

3. FINDINGS AND DISCUSSION

This study highlights the enhancement of competency among Physical Health and Recreation Education students graduates using Android-based teaching media in rhythmic activity subjects for the 2022/2023 Academic Year. Developing a draft model involves conducting a preliminary study and creating the draft model. During the initial study, discussions were conducted with various lecturers, including those teaching rhythmic activity courses, media experts, subject matter specialists, and curriculum experts. The Focus Group Discussion lasted for a duration of 2 hours. After analyzing the discussion outcomes, key insights were gathered to address issues in both online and offline learning. Planning to develop android-based media on rhythmic gymnastics subjects based on the results of the Focus Group Discussion. The findings from the Focus Group Discussion are displayed in the table below.

Table 1. Focus Group Discussion Results

No	Notes
1	Lecturers and students need a media that can be used for both online and offline learning
2	This media can be studied on Android because you can see that all students have Android.
3	Media can attract the millennial generation, especially the generation that likes gadgets.
4	Media can be operated online or offline

The preliminary model includes the background of the development, the goals of development, and media content based on Android. Within the development field, media based on Android offers a solution for educators and learners to enhance their skills in rhythmic gymnastics. Due to Android-based media, students have the flexibility to learn rhythmic gymnastics material and movements at their convenience. Students can acquire knowledge not only during class time but also outside of the classroom and beyond regular hours. The development goals focus on creating adaptable learning resources that are seamlessly incorporated into students' lives, supporting educators in delivering content effectively, and aiding students in comprehending rhythmic gymnastics material (Kartini, 2020). Content on Android devices includes login pages, app homepages, user profiles, study plans, and rhythmic gymnastics material. Students can proceed on the login page by selecting Android-based media for rhythmic gymnastics and then pressing the menu to access learning materials. Students will engage with rhythmic gymnastics learning materials through the application. Here is Figure 1 displaying the login page.

**Figure 1.** Media Front Page

On the application home page (Android-based media), the application homepage is the page that is displayed after students log in or enter the application. The home page is equipped with menu options such as profiles, rhythmic gymnastics semester study plans, and rhythmic gymnastics material in the form of rhythmic gymnastics videos. The profile menu contains a brief explanation of rhythmic gymnastics. Students can know the definition or understanding of rhythmic gymnastics in a simple way so that it will provide an overview of rhythmic gymnastics. Students will have an overview of the contents of rhythmic gymnastics material when they understand the definition of rhythmic gymnastics

itself. The semester study plans, students can also study at any time the material that will be given in the semester study plans. Before study meetings, students can study beforehand so that when face-to-face study, they already have an overview of the material to be studied. This semester's study plans also make it easier for lecturers to control the material that will be given to students for the next semester. The view of semester study plans in Android-based media can be seen as follows.

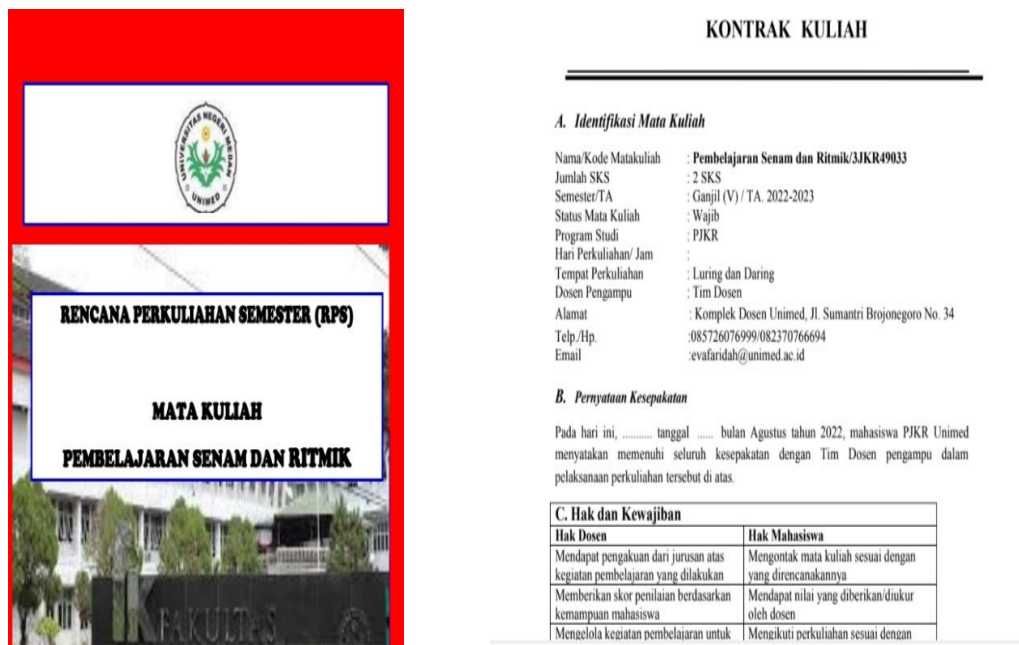


Figure 2. View of Semester Study Plans

Content on Android media features videos demonstrating various rhythmic gymnastics movements. Facilitating student learning and practice of rhythmic gymnastic movements. Students have the flexibility to practise at their convenience by mimicking the actions demonstrated in the educational materials. One can observe the presence of rhythmic gymnastics content on Android-based platforms.



Figure 3. View of Rhythmic Gymnastics Material

The results of expert validation using 8 indicators obtained 7 in the very good category and 1 in the good category. The following results were obtained based on the validation results.

Table 2. Expert Validation Results

No	Indicator	Expert 1	Expert 2	Expert 3	Average	Category
1	Learning Media Support Theory Background of Learning Media	4	4	4	4	Very Good
2	Development Learning Media Development	4	4	4	4	Very Good
3	Goals.	4	3	4	3,67	Very Good
4	Login Page	4	3	3	3,33	Good
5	Application Homepage	4	4	4	4,00	Very Good
6	Profile	3	4	4	3,67	Very Good
7	Semester Study Plans	4	4	3	3,67	Very Good
8	Rhythmic Gymnastics Material	4	4	4	4	Very Good

Based on the validation, experts provide some notes that can make the model better. Some expert notes can be seen in the following table.

Table 3. Notes of Expert Advice on Android-Based Media Results

No	Experts	Recommendation
1	DGF	The description of the use of the media is more detailed so that the lecturer can easily use it later.
2	AGR	a. The material is added, not just 2, making it easier for students to choose the rhythmic gymnastics they want b. The entry page adds illustrations of gymnastics images so as to provide a direct picture to media users
3	PHB	a. The material added again is too little if only 2 b. Semester study plans are more detailed and complete

An Android-based media for rhythmic gymnastics has been validated by experts, and instruments have been tested to determine their validity and reliability before being utilised in small class trials. Items are evaluated in a limited class setting on two occasions: before and after adjustments. After analysing the outcomes of the small class experiment, the evaluation of the product in the small class yielded the following findings.

Table 4. Small Class Rhythmic Graduation Competency Assessment Results

No	Criteria	Pretest		Posttest	
		Frequency	(%)	Frequency	(%)
1	Good	1	3,3	24	80
2	Good Enough	10	33,3	6	20
3	Less Good	16	53,4	0	0
4	Bad	3	10	0	0
Total		30	100	25	100

The results of students' abilities in rhythmic activities before and after being given learning using android-based media in rhythmic gymnastics obtained information indicating a significant difference. At the pretest stage, most of the students' rhythmic activity abilities were classified as less good,

namely, there were as many as 53.4%. This assessment was carried out on students before being given learning using rhythmic gymnastics android-based media. However, after students in small classes were given learning using Android-based media, rhythmic gymnastics showed different results (Tafonao, 2018). Most students have good abilities in rhythmic activities, namely, there are as many as 80%. Students are able to carry out basic rhythmic activity movements properly according to the directions conveyed during learning using rhythmic gymnastics android-based media. The results of comparing abilities before and after learning in small class trial can be seen as follows.

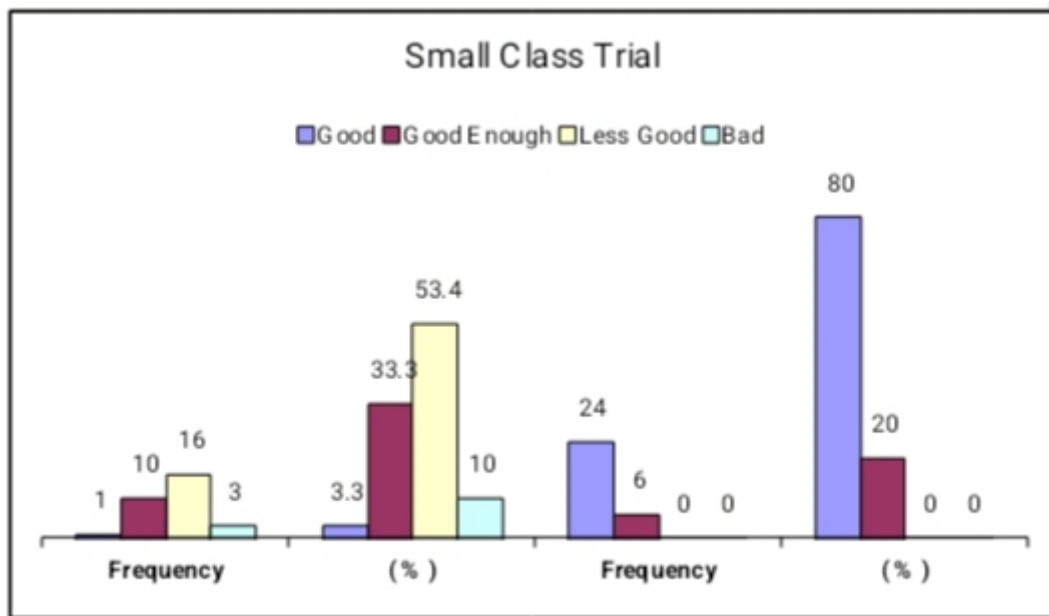


Figure 3. Comparison of Small Class Trial Capability

After being tested in small classes, products demonstrated an improvement in students' graduation ability in rhythmic gymnastics both before and after using Android-based media. Testing was conducted on 50 students using a wide range of products. Students included in extensive class trials are those who have not been included in smaller classes. The results of the assessment before and after the learning process are displayed in the table below.

Table 5. Results of the Large Class Rhythmic Graduation Competency Assessment

No	Criteria	Pretest		Posttest	
		Frequency	(%)	Frequency	(%)
1	Good	3	6	48	96
2	Good Enough	18	36	2	4
3	Less Good	28	56	0	0
4	Bad	1	2	0	0
Total		50	100	50	100

The results of the large class trial of rhythmic gymnastics android-based media obtained information indicating a significant difference. The competency ability of students' rhythmic gymnastics graduation before and after learning is significantly different. At the pretest stage, most of the students' rhythmic activity abilities were classified as less good criteria, namely, there were as many as 56%. This assessment is carried out to students before being given learning using Android-based media. However, after students in large classes were given learning using Android-based media, the results were different. Most of the students have good abilities in rhythmic gymnastics. Students are able to carry out basic rhythmic activity movements properly according to the directions conveyed

during learning using Android-based media. The results of the large class assessment for students' rhythmic gymnastics graduation competency abilities can be seen in the following diagram.

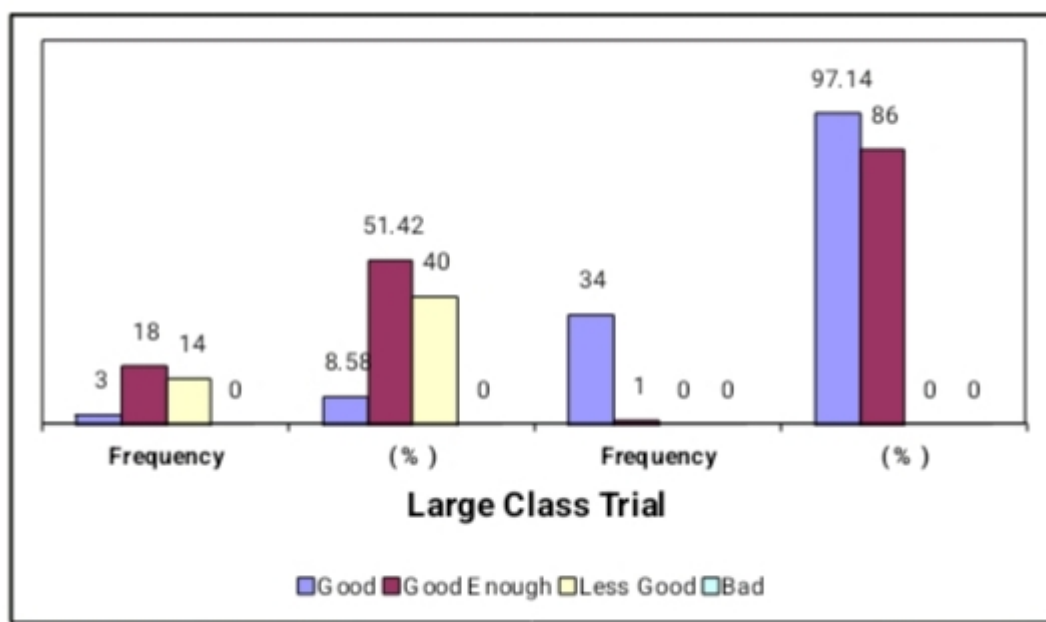


Figure 4. Large Class Rhythmic Gymnastics Graduation Competency Assessment

The model for Android-based media products after a large-scale trial is carried out becomes the final product that can be used as a whole. The final product includes, among others: the development background, development goals, and Android-based media content. Android-based media content includes login pages, application homepages (Android-based media), profiles, semester study plans, and rhythmic gymnastics material

Based on the results of assessing students' rhythmic activity abilities in the stages of small class and large class, the following statistical description is obtained.

Table 6. Description Statistical Ability of Pretest Stage Rhythmic Activity

		Statistics	
		Pretest Small Class Score	Pretest Large Class Score
N	Valid	30	50
	Missing	0	0
Mean		42.8667	42.5800
Median		43.0000	43.0000
Std. Deviation		7.24323	7.95675
Variance		52.464	63.310
Minimum		28.00	27.00
Maximum		62.00	64.00

According to the statistical tests conducted, data regarding students' proficiency in rhythmic gymnastics upon graduation is gathered prior to using rhythmic gymnastics android-based media for learning. On average, students in small classes score 42.87, compared to 42.59 for students in large classes. The average value is quite similar, showing that students in small classes and large classes generally possess the same fundamental skills in rhythmic gymnastics graduation. Small-class students achieved a similar low score of 28, compared to 27 for large-class students. Students with the lowest ability in rhythmic activity remain consistent and show little variation. The top score remains consistent with the smaller class achieving 62 and the larger class achieving 64.

Students who have been given learning using online media based on rhythmic gymnastics are again assessed for their ability to perform rhythmic activities. The results of the assessment of the ability of this rhythmic activity can be described statistically as follows.

Table 7. Description of Statistical Ability of The Posttest Stage of Rhythmic Activity

		Statistics	
		Posttest Small Class Score	Posttest Large Class Score
N	Valid	30	50
	Missing	20	0
Mean		63.6667	66.0800
Median		63.0000	66.5000
Std. Deviation		3.88927	3.82174
Variance		15.126	14.606
Minimum		57.00	56.00
Maximum		70.00	74.00

Based on the results of the statistical tests above, information on the competence of students' rhythmic gymnastics graduation was obtained before learning with Android-based media. The average score obtained by students in small classes is 63.67, while in large classes, it is 66.09. The mean values are not much different, indicating that students in small and large classes on average have the same ability to graduate in rhythmic gymnastics after treatment. The lowest score obtained by small-class students was also not much different, namely 57 for small classes and 56 for large classes. This means that students who have the lowest ability to pass rhythmic gymnastics 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 70 while the large class scores 67.

The hypothesis is to determine whether there is a difference in the average product rating at the pre and post-stages in the small class and the large class, the results of the paired sample t test are obtained as follows.

Table 8. Hypothesis Testing

No	Groups	Average	Deviation	T count	P value
1	Small Pre-Class	42,87	20,8	15,49	0,000
2	Small Post-Class	63,67			
3	Large Pre-Class	42,58	23,5	19,06	0,000
4	Large Post-Class	66,08			

Based on the results of hypothesis testing, it is known that the calculated T - count in the small class is 15.49 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 competency of students' rhythmic gymnastics graduation before and after using rhythmic gymnastics android-based media. Students experience an increase in the competence of rhythmic gymnastics graduation after learning to use rhythmic gymnastics android-based media.

Based on the results of hypothesis testing, it is known that the calculated t-count in the large class is 19.06 with a P-value of 0.000. The P- value is lower than 0.05 ($0.000 < 0.05$) so that it means that the hypothesis is accepted that there is a significant difference in the competency of students' rhythmic gymnastics graduation before and after using rhythmic gymnastics android-based media. Students experience an increase in their competence in rhythmic gymnastics graduation after learning to use rhythmic gymnastics Android-based media in large classes.

Based on the student's responses questionnaire after participating in learning using rhythmic gymnastics Android-based media, the following classification results were obtained.

Table 9. Student's Responses to Media.

No	Criteria	Frequency	(%)
1	Very Good	50	62,5
2	Good	29	36,25
3	Good Enough	1	1,25
4	Less Good	0	0
Total		80	100

Feedback from opinion questionnaires and student reactions to Android-based media for rhythmic gymnastics indicated that the majority responded positively to the media. Based on the findings of the research questionnaire, 62.5% of respondents indicated that they believed the learning media utilised was excellent. Approximately 50 students were providing excellent feedback to the media. Responses that fell into the good category accounted for 36.25%, which equates to 29 students. 1.25% of the responses were satisfactory, with no inadequate responses. Here is a diagram illustrating the results of these responses.

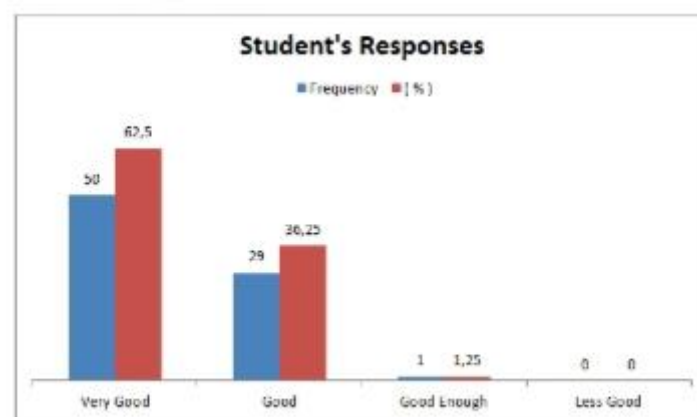


Figure 5. Student's Responses to the Media

The final product is then asked to try out which is carried out by 3 lecturers with different material that is still related to student rhythmic activities. Based on the lecturer's response questionnaire after using the android-based media for rhythmic gymnastics, the following responses or assessments were obtained.

Table 10. Lecturer's Responses to Android-Based Media

No	Indicator	1st Lecturer	2nd Lecturer	3rd Lecturer
	Easy-to-use media	3	3	3
2	Media helps teaching	3	3	3
3	flexible media in its use	2	3	3
4	Media can solve problems	3	3	2
5	Media attracts students	3	3	3
Total		14	15	14
Maximum Score		15	15	15
Percentage (%)		93,33%	100,00%	93,33%

According to feedback from lecturers who have utilised rhythmic gymnastics android-based media, all 3 lecturers agreed that the developed model was excellent and suitable for learning rhythmic gymnastics material. Lecturers can utilise various media formats for both online and face-to-face learning purposes. Based on the results, the statistical analysis indicates a significant value of 0.000, suggesting that the model can significantly enhance students' proficiency in rhythmic gymnastics. Graduation competencies in rhythmic gymnastics for students, particularly the fundamental movements they possess prior to engaging with rhythmic gymnastics through an android-based platform, demonstrate a notable improvement. Lecturers effectively utilise teaching media. Learning rhythmic activities offers the benefit of enhancing creativity, mental abilities, social skills, and rhythmic movement skills (Otero et al., 2020).

This model's development aligns with the concept of rhythmic motion from a component in the Dalcroze Eurhythmics approach. Dalcroze's philosophy highlights the importance of engaging students in rhythmic movement activities to help them connect with musical elements like rhythm and melody, which can lead to automatic movement responses. Dalcroze's concept of incorporating movement into musical exercises can enhance students' cognitive abilities in acquiring rhythmic skills (Brotz et al., 2015). This occurs due to two fundamental elements that explain the connection between sound and movement: tone and motion. There is a natural inclination towards rhythmic movement in individuals, making it a significant musical element closely intertwined with human life. It is essential for movement and rhythm to be in sync.

4. CONCLUSION

Developing Android-based teaching tools for rhythmic gymnastics can enhance the skills of graduate students in the field, facilitating instructors in delivering quality education. Students respond positively to the results of the Android-based rhythmic gymnastics media development when using it. Lecturers are advised to develop teaching media that align with the teaching requirements of rhythmic gymnastics courses. Regarding future research, one potential avenue is to create online application-based virtual training tools for students to practise rhythmic gymnastics.

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