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# Motion Assessment Application Design Development Android based Artistic Gymnastics

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**Abstract**

This study is to measure the feasibility of developing an android-based artistic movement assessment application design. The purpose of this study is to produce an android-based artistic gymnastics assessment application product that can be used for students of SMA XI Private Maitreyawira in assessing floor gymnastics exams. Trial on students who take part in learning activities at SMA XI Private Maitreyawira. This study uses the development of Research & Development (R&D) from. Based on the results of the feasibility assessment by material experts, the material aspect obtained a percentage score (92%), the application aspect obtained a percentage score (88%). The results of the feasibility assessment by media experts on the material aspect obtained a percentage score (94%), on the video aspect obtained a percentage score (95%), and on the application aspect obtained a percentage score (96%). The results of the feasibility assessment by PJOK teachers in the use of an android-based artistic movement assessment application obtained a percentage score (95%). Student learning outcomes on floor gymnastics material obtained a percentage score (91%), with an average score of 90.6. Based on the results of this android-based application design development research, it can be concluded that the assessment instrument is feasible to use in assessing floor gymnastics for class XI SMA Private Maitreyawira.

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## INTRODUCTION

The development of science and technology (IPTEK) provides its own challenges for education graduates to create learning media that can improve the quality of education better. The development of science and technology encourages teachers to produce learning media. One of the technological advances that is currently developing is the smartphone. A smartphone is a device that allows communication (calling or texting) but it also has a PDA (Personal Digital Assistant) function and is capable like a computer. Physical Education, Sports and Health are absolute and essential in the development of a nation's life for the sake of the development of the nation's life to achieve progress in science and technology in the field of Physical Health and Recreation (Pratiwi et al., 2017).

Android functions as a link between users and hardware on smartphones or certain electronic devices. The most prominent characteristic of Android is its open source nature. Android is made to be completely open so that applications can call the core functions of the phone such as sending text messages, making calls, using the camera, and others. Android-based applications are applications for touchscreen mobile devices such as smartphones and tablet computers with Linux-based operating systems. (Nurwita, 2020). Mastering floor gymnastics skills in the training process requires a strong mentality. (Sheth, 2016). With a strong mentality, students' minds and muscle movements can practice floor gymnastics movements which are classified as very complicated (McKenzie et al., 2014). In addition, the influence of friends' experiences who failed to train floor gymnastics skills and even caused injuries will affect the mental level of students who want to practice floor gymnastics (Allen, 2016).

Floor gymnastics or gymnastics is a type of sport that is often done by the community and has been introduced since elementary school age. This sport does not require a lot of equipment, only requires a mat and a floor gymnastics wall. In general, gymnastics is an effort to improve physical fitness (Mulhim et al., 2014). In gymnastics, there are six main physical components that must be possessed by gymnasts, including speed, power, isometric and explosive force, strength, endurance, and dynamic and static flexibility (Mkaouer et al., 2018) (Mkaouer et al., 2021).

In official competitions, floor gymnastics is done on a mat (Hadjarati & Haryanto, 2020). In Indonesia there is the All Indonesia Gymnastics Association (Persani) while at the international level there is the Federation Internationale de Gymnastique (FIG). "Here are various floor gymnastics movements that are usually taught, including: forward rolls, backward rolls, bridges, wheelies and tiger jumps" (Antoni & Sudarso, 2019).

Floor gymnastics is one of the gymnastics that focuses on movements on the floor or mattress which is the main tool used in floor gymnastics (Muhajir, 2014) Floor gymnastics is included in the artistic gymnastics group which is a combination of somersaults and acrobatics to obtain artistic effects using special tools. The artistic effect of floor gymnastics is produced from the magnitude (amplitude) of movement and the perfection of body movement when performing various positions (Prasetyo & Sunarti, 2016). An individual certainly needs a learning and training process to be able to master the perfection of movement in floor gymnastics. Gymnastics is a physical activity with objects of movement on all parts of the body which is used as a means to achieve

a good level of health (Permana & Hoedaya, 2015). The Federation International de Gymnastique (FIG) divides gymnastics into six groups, including artistic gymnastics, rhythmic sportsmanship gymnastics, acrobatic gymnastics, aerobics, trampoline gymnastics, and general gymnastics (Widowati & Rasyono, 2018). Floor gymnastics is a type of artistic gymnastics that combines various forms of body skills that emphasize the beauty of movement, complexity of movement, strength of movement, flexibility of movement, balance, and flexibility of movement to be displayed in the field of floor gymnastics (Nassar, 2016). A floor gymnastics athlete is free to mix various body movements such as pedaling, bouncing, rolling, falling, flipping, and so on with various styles and expressions (Sands et al., 2016).

The development of Android-based media has created a need for each user to facilitate every activity including in the aspect of educational needs (Astuti et al., 2018). Android is developed with Google's open source operating system and is based on data from Start Counter Global Stats (Faried et al., 2017). Mobile learning is learning that students can do anywhere and anytime without having to be accompanied by a lecturer. Mobile learning also allows students to learn by accessing all learning materials according to their needs (Jones & Dexter, 2014). Android-based multimedia coverage combines the process of producing or creating the intended content according to the objectives with accessible publications (Astuti et al., 2018). he developed Android media provides each student with the provision to be able to do exercises at any time as needed, so that it can maintain student competence. Android is a technological development with media specifications that can accommodate various types of needs, including visual, audio, audio-visual, graphic arts, text, and soft file-based needs (Helmi & Aditya, 2020).

According to Mahmudi Sholeh quoted in Iwan, (2013) floor exercise is one of the gymnastics groups, according to the term "floor" the movements are carried out on the floor with a mat or carpet which is the tool used. Floor gymnastics is also called free gymnastics because when doing movements or gymnastics the gymnast does not carry or use equipment (an object). Meanwhile, gymnastics according to Heryana and Veiyanti, (2010:89) is a sport that involves all parts of the body. Floor gymnastics is also one of the gymnastics that is competed at the international level.

Currently, students who are taking part in learning at Maitreyawira Private High School Deli Serdang have problems in doing movements, exercises, namely limitations in being able to do exercises in participating in PJOK learning, especially in doing movements, namely standing, jumping and spinning. In doing movements, it can only be done in PJOK learning whose duration has been determined by the learning meeting hours, while in learning it is only a few hours so that students who enter PJOK learning cannot get the material optimally. In addition, when doing distance learning which is often done, the internet network is a problem that is often faced. For participants whose homes are in urban areas, it is not a problem, but for students who live in remote areas, the internet network is a problem. To be able to repeat the floor gymnastics movement exercises that have been obtained is also difficult to do. This problem must of course be solved in order to improve student skills.

## METHODS

Researchers use the research and development (R&D) method. According to (Sugiyono, 2017) the research and development method is a research method used to produce a particular product and test the effectiveness of the product. The development model used in this development is the ADDIE Model which is one of the systematic learning design models. Romiszowski (1996) stated that at the level of design and development of learning materials, systematics as a procedural aspect of the systems approach has been realized in many methodological practices for the design and development of texts, audiovisual materials, and computer-based learning materials.

This model consists of five steps, namely: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. (Ricky et al., 2021) (Tegeh et al., 2015). Development research can be utilized in developing a product that is useful for realizing superior human development through research (Kurniawan, 2021). This research was conducted at SMA Swasta Maitreyawira Deli Serdang Jl. Cemara Boulevard Utara No. 8 Cemara Asri Complex, Sampali, Percut Sei Tuan District, Deli Serdang Regency, North Sumatra Province with the subjects of this study being Class XI Actualization students at Maitreyawira Private High School Deli Serdang. The number of students was 32 people. The time of this research was carried out in the even semester of the 2023-2024 academic year, namely January - February 2024.

**Participants**

A population is a general area consisting of objects or subjects that have a certain number and characteristics determined by the researcher to be studied and then concluded. According to (Mahardika, 2015) a sample is part of the population. In accordance with the opinion above, the population and sample in this study are all class XI students of Maitreyawira Private High School Deli Serdang.

**Sampling Procedures**

A sample is part of the population. In accordance with the opinion above, the population and sample in this study were all students of class XI of SMA Swasta Maitreyawira Deli Serdang.

**Materials and Apparatus**

The instruments in this development research used data collection instruments including questionnaires. According to (Sugiono, 2010) Questionnaires are data collection techniques by providing written questions to respondents to be answered. Questionnaires can be in the form of closed or open questions/statements (Sugiyono, 2012) types of questionnaires according to their form are divided into three, namely. (1) Multiple choice questionnaires. (2) Check list. (3) Assessment Scale. Data collection in this android-based artistic gymnastics movement assessment application design research used questionnaires in the form of statements which on the next page were accompanied by a suggestion column. The questionnaire was given to media experts, material experts, Instrument Validators and students.

**Procedures**

The technique used for this data analysis uses quantitative data and qualitative data. Quantitative data is obtained from the results of the questionnaire. While qualitative data is obtained in the form of suggestions given by material experts and media experts for product revisions during the development process. Quantitative data is obtained by distributing questionnaires or product trial questionnaires during the trial activity. Then the data is analyzed using

quantitative descriptive analysis. The questionnaire used in this study uses a basis for assessing a number of opinions which are then used as a percentage of each answer. After obtaining the percentage with this formula, the feasibility is then classified into four categories in **Table 1. Percentage of feasibility**

**Design or Data Analysis**

The design of this study uses ADDIE development research as the name implies, a model that involves stages of model development with five steps / stages of development including: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was developed by Dick and Carry in 1996 to design an ADDIE Model learning system using five stages of development, namely: (1). Analysis, namely conducting a needs analysis. Identify problems, identify products that are in accordance with the target, think about the products to be developed. In this case, identifying student learning needs related to the development of learning media. (2). Design is the stage of designing the concept of the product to be developed. At this stage, researchers design applications that are tailored to student characteristics and learning materials. (3). Development is the process of realizing a design that has been designed into a product. The product developed is an android-based artistic gymnastics movement assessment application. (4). expectations or not. (Omega & Salsabila, 2021)

**RESULT**

Product planning begins with a discussion about the design of an android-based artistic gymnastics assessment application, menu content, and how to use it with the supervising lecturer Prof. Dr. Imran Akhmad, M.Pd. The android application is used to prepare for artistic gymnastics learning to make it easier for students to understand the material taught by the PJOK teacher. The menu content consists of an introduction, video, word material, disqualification, and about the application. In the introduction, there are several explanations about the floor gymnastics curriculum which consists of several components of the front roll movement, back roll movement, wheeling movement, tiger jump movement, standing hand movement, bridge movement, splitting movement, running movement and hand spring movement. Then in the video there is a learning video starting from the initial position, implementation position and final position. Then in the floor gymnastics material menu there is an explanation of the assessment carried out on the stages of floor gymnastics movements.

**Expert Validation Material**

The expert material validator is Dr. Abdul Hakim Siregar, S.Si., M.Pd. who has expertise in assessing floor gymnastics material and is also a lecturer in the Postgraduate program at the State University of Medan. With 11 assessment items, the validation results can be seen in **Table 2.** Results of Material Expert Validation. From the table, the results of the material expert validation get the category "Feasible" and the android-based artistic gymnastics movement assessment application can be tested without revision. Based on the results of the feasibility assessment by the material expert on the aspect of floor gymnastics material in accordance with the literature on floor gymnastics learning consisting of: (1). Introduction; (2). Video material; (3). Assessment; (4). Reflection; (5). Teaching module. The sequence of floor gymnastics material in data storage is

appropriate, ease of understanding the movements, the display is in accordance with the provisions, clarity of material movements, attractiveness of material presentation, has a percentage score (92%), in the application aspect, namely the suitability of the material with applicable regulations, the preparation of a brief application guide from opening to closing is easy to understand, the accuracy of the material with learning, the easy-to-use data storage format has a percentage score (88%). There are several inputs/suggestions given by the material expert as material for further research. The input is in the form of an enlarged explanatory letter, the material menu explains in more detail, the qualification menu is replaced with regulations, the delivery of words becomes shorter and more concise. **Figure 1.** Percentage of Material Expert Assessment Scores.

**Media Expert Validatio**

The media expert validator is Prof. Dr. Indra Kasih., S.Pd., M.Or who has expertise in the field of media and is also a lecturer at the Faculty of Sports Science, State University of Medan. There are 17 assessment items that are assessed, the validation results can be seen in **Table 3.** Media Expert Validation Results. From the table, the media expert validation results get the category "Feasible" and the floor gymnastics assessment application can be tested without revision. Based on the results of the feasibility assessment by the media expert on the material aspect, namely the clarity of the movement material, the suitability of the movement sequence, the ease of understanding the movement, has a percentage score (94%), on the video aspect, namely the quality of the floor gymnastics material in the video, slow motion of the floor gymnastics material movement in the video, several angles of view of the floor gymnastics material in the video, clarity of color in the video, the attractiveness of the video has a percentage score (95%), and on the application aspect, namely instructions for using the Application, ease of use of the application, the attractiveness of the application display, accompanying music in the application, the sequence of material in the application, readability of the text, clarity of language use has a percentage score (96%). Suggestions/inputs given by media experts are to add the researcher's identity to the section about **Figure 2.** Percentage of media expert assessment scores.

**Implementation**

This stage is a continuation of the development stage. At this stage, all media designs that have been developed are implemented after revision. The assessment instrument uses an Android-based application that has been developed, implemented in a real situation, namely at school. At this stage, the researcher conducted a rigid product trial on students of SMA Swasta Maitreyawira Deli Serdang. The trial was intended to see the level of practicality of the media. The trial was conducted in class XI-Aktualisasi, totaling 32 students. Because this trial was carried out in the field of SMA Swasta Maitreyawira Deli Serdang, students who took part in PJOK learning were asked to bring their own cellphones to support the product trial. Before conducting the trial, students were given instructions on the word assessment instrument using an Android-based application.

After the teacher and students had finished observing the media, then on the last day of the trial, a questionnaire was given by the researcher. This questionnaire aims to see the extent to which teachers and students responded to the assessment instrument using the Android-based application that had been developed. The results of teacher responses to the android-based word assessment instrument can be

seen in **Table 4.** Recapitulation of Teacher Questionnaires Based on the results of teacher responses to the android-based vocabulary assessment instrument, a percentage of 95% was obtained with a sufficient category. The assessment of eligibility by the PJOK teacher on the aspect of suitability with learning needs and media on the instrument helps students understand the material of artistic gymnastics movements based on android floor gymnastics has a score of 3. While in the aspect of media utilization, students are interested in the suitability of the material, the suitability of the material with learning indicators, the media on the android-based artistic gymnastics movement assessment instrument floor gymnastics is in accordance with learning indicators, the media on the android-based artistic gymnastics movement assessment instrument floor gymnastics is in accordance with learning objectives, the media on the instrument can be done easily, and the ease of implementing learning with the developed word assessment instrument has a score of 4.

Meanwhile, student understanding is measured by the artistic floor gymnastics assessment rubric which can be seen in **Table 5.** Recapitulation of Floor Gymnastics Learning Achievements. Based on this table, it is known that the data on floor gymnastics learning achievements using the android-based artistic gymnastics learning application obtained an average score of 90.6 with a percentage of 91%.

Furthermore, the data is arranged in the form of a frequency distribution table of student learning outcomes in **Table 6.** Frequency Distribution of Floor Gymnastics Learning Outcomes. Based on this table, it is known that the data on floor gymnastics learning outcomes using the Android-based artistic gymnastics learning application obtained by 22 students with a percentage of 68.75% are classified as very good. A total of 10 students with a percentage of 31.25% are classified as good. Furthermore, the data is arranged in the form of a histogram as in **Figure 3.** Histogram of Student Learning Outcomes.

**Evaluation**

Evaluation is the final stage of the ADDIE development model, namely the process of measuring the success of the product made according to initial expectations or not. (Omega & Salsabila, 2021). The evaluation referred to here is an evaluation of the results of implementation activities. The evaluation results were obtained from suggestions from teachers and students during the trial. The suggestion given is that it would be better if this application could be used en masse so that the benefits of this learning media can facilitate students and teachers in the learning process.

## Tables & Figures

**Table 1.** Percentage of feasibility

| No | Percentage | Credentials |
|---|---|---|
| 1 | 76%-100% | Proper |
| 2 | 56%-75% | Pretty Decent |
| 3 | 40%-55% | Less Decent |
| 4 | 0%-39% | Not Worth It |

**Table 2.** Material Expert Validation Results

| No | Statement | Value | Max Value | Percentage | Category |
|---|---|---|---|---|---|
| 1. | Materials In Accordance With The Latest Regulations | 4 | 4 | 100 % | Proper |
| 2. | Value Accuracy Is Correct | 3 | 4 | 75 % | Proper |
| 3. | The Order Of Word Material In The Data Store Is Appropriate | 4 | 4 | 100 % | Proper |
| 4. | Ease Of Understanding Movements | 4 | 4 | 100 % | Proper |
| 5. | Display In Accordance With Regulations | 3 | 4 | 75 % | Proper |
| 6. | Clarity Of Movement In The Material | 4 | 4 | 100 % | Proper |
| 7. | Attractiveness Of The Presentation Of The Material | 4 | 4 | 100 % | Proper |
| 8. | Compatibility Between The Material And Applicable Regulations | 4 | 4 | 100 % | Proper |
| 9. | Accuracy Of Material With Learning | 3 | 4 | 75 % | Proper |
| 10. | Preparation Of A Brief Guide For Applications From Opening To Closing Is Easy To Understand | 4 | 4 | 100 % | Proper |
| 11. | The Data Storage Format Is Easy To Use | 3 | 4 | 75 % | Proper |
| | **SUM** | 40 | 44 | 90 % | Proper |

**Table 3.** Media Expert Validation Results.

| No | Indicators | Descriptors | Value | Max Value | Percentage | Category |
|---|---|---|---|---|---|---|
| 1 | Material | Clarity of movement material | 4 | 4 | 100 % | Proper |
| 2 | | Suitability of the sequence of movements | 4 | 4 | 100 % | Proper |
| 3 | | Ease of understanding movements | 3 | 4 | 75 % | Proper |
| 4 | | Accuracy of movement | 4 | 4 | 100 % | Proper |
| 5 | Video | The quality of the word material in the video | 4 | 4 | 100 % | Proper |
| 6 | | Slowmotion motion of word material in video | 4 | 4 | 100 % | Proper |
| 7 | | Narration of material in the video | 3 | 4 | 75 % | Proper |
| 8 | | Some points of view of word material in the video | 4 | 4 | 100 % | Proper |
| 9 | | Color clarity in video | 4 | 4 | 100 % | Proper |
| 10 | | Video highlights | 4 | 4 | 100 % | Proper |
| 11 | | Instructions for use of the application | 4 | 4 | 100 % | Proper |
| 12 | | Ease of use of the app | 4 | 4 | 100 % | Proper |
| 13 | | The attractiveness of the appearance of the application | 4 | 4 | 100 % | Proper |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | Application | In-app accompaniment music | 4 | 4 | 100 % | Proper |
| 15 | | The order of the material in the application | 4 | 4 | 100 % | Proper |
| 16 | | Text readability | 3 | 4 | 75 % | Proper |
| 17 | | Clarity of language use | 4 | 4 | 100 % | Proper |
| | | **SUM** | 65 | 68 | 95 % | Proper |

**Table 4.** Recapitulation of Teacher Questionnaire

| No | Statement | Value | Max Value | Percentage | Category |
|---|---|---|---|---|---|
| 1. | The Use Of Media Is In Demand By Students | 4 | 4 | 100 % | Proper |
| 2. | Suitability To Learning Needs | 3 | 4 | 75 % | Proper |
| 3. | Suitability Of The Material To Learning Indicators | 4 | 4 | 100 % | Proper |
| 4. | Media On The Word Assessment Instrument For Floor Gymnastics In Accordance With Learning Indicators | 4 | 4 | 100 % | Proper |
| 5. | The Media On The Assessment Instrument Said Floor Gymnastics Is In Accordance With The Learning Objectives | 4 | 4 | 100 % | Proper |
| 6. | The Type Of Media On The Assessment Instrument For The Word Floor Gymnastics Is In Accordance With Learning Indicators | 4 | 4 | 100% | Proper |
| 7. | The Media On The Assessment Instrument Said Floor Gymnastics Is In Accordance With Learning Indicators | 4 | 4 | 100 % | Proper |
| 8. | The Media On The Instrument Helps Students In Understanding The Floor Gymnastics Material | 3 | 4 | 75 % | Proper |
| 9. | Media On Instruments Can Be Done Easily | 4 | 4 | 100 % | Proper |
| 10 | Ease Of Carrying Out Learning With Android-Based Artistic Gymnastics Movement Assessment Instruments Developed | 4 | 4 | 100 % | Proper |
| | ***Sum*** | *38* | *40* | *95 %* | *Proper* |

**Table 5.** Recapitulation of Floor Gymnastics Learning Outcomes

| No Respondents | Total Score | Value |
|---|---|---|
| 1 | 55 | 92 |
| 2 | 57 | 95 |
| 3 | 56 | 93 |
| 4 | 54 | 90 |
| 5 | 58 | 97 |
| 6 | 56 | 93 |
| 7 | 55 | 92 |
| 8 | 47 | 78 |
| 9 | 48 | 80 |
| 10 | 54 | 90 |
| 11 | 52 | 87 |
| 12 | 52 | 87 |
| 13 | 56 | 93 |

| | | |
|---|---|---|
| 14 | 55 | 92 |
| 15 | 59 | 98 |
| 16 | 52 | 87 |
| 17 | 52 | 87 |
| 18 | 55 | 92 |
| 19 | 52 | 87 |
| 20 | 51 | 85 |
| 21 | 58 | 97 |
| 22 | 54 | 90 |
| 23 | 56 | 93 |
| 24 | 56 | 93 |
| 25 | 58 | 97 |
| 26 | 59 | 98 |
| 27 | 57 | 95 |
| 28 | 56 | 93 |
| 29 | 54 | 90 |
| 30 | 51 | 85 |
| 31 | 54 | 90 |
| 32 | 51 | 85 |
| **Sum** | | 2900 |
| **Average** | | 90,6 |
| **Percentage** | | 91% |

**Table 6.** Frequency Distribution of Floor Gymnastics Learning Outcomes

| Class | Class Interval | Absolute Frequency | Relative Frequency | Category |
|---|---|---|---|---|
| 1 | 89 - 100 | 22 | 68,75 | Excellent |
| 2 | 88 - 77 | 10 | 31,25 | Good |
| 3 | 65 - 76 | 0 | 0 | Enough |
| 4 | <65 | 0 | 0 | Less |
| **Sum** | | 32 | 100% | |

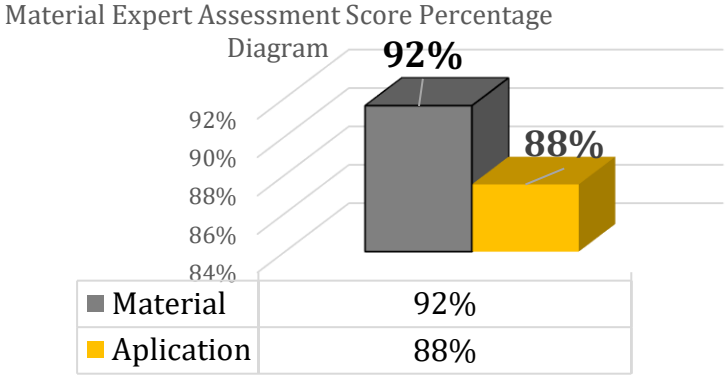


**Figure 1.** Material Expert Assessment Score Percentage

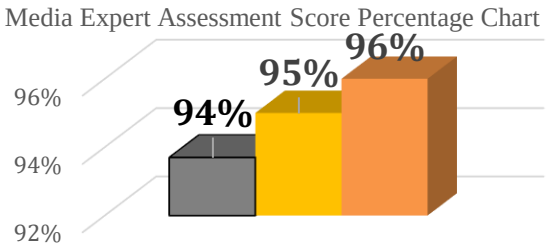


**Figure 2.** Media expert assessment score percentage

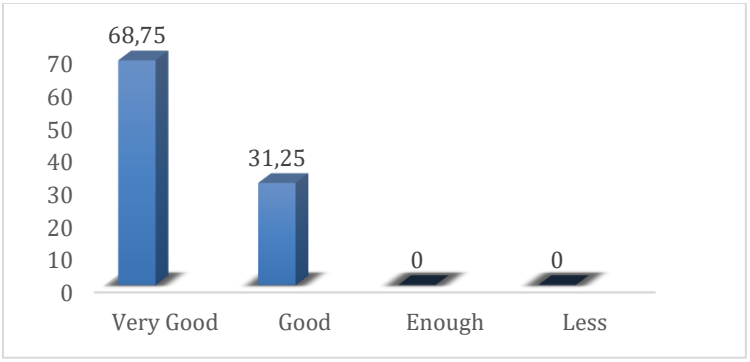


**Figure 3.** Histogram of Student Learning Outcomes

## DISCUSSION

The development of the design of an android-based floor gymnastics assessment application was made into a product in the form of an android-based floor gymnastics assessment application that runs on the android system which aims to help maximize student preparation in learning much better. The creation of this android-based floor gymnastics assessment instrument uses the research and development (R&D) method with 5 development models developed by Dick and Carry. In general, the 5 development models in question start from Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was developed by Dick and Carry in 1996 to design a learning system. Based on the initial product that has been made, tests were carried out by material experts and media experts, the data obtained after conducting validity tests from material experts and media experts were used as material for revising the floor gymnastics assessment application product. Based on the validation results provided by material experts and media experts, the floor gymnastics assessment product is included in the "feasible" category to be tested on students who take part in floor gymnastics learning in Class XI of Maitreyawira Private High School. Then after revisions were made based on the assessment and comments from the experts. The results of the field trial obtained a trial percentage of 91%, it is known that the data on the results of learning floor gymnastics using the android-based artistic gymnastics learning application obtained by 22 students with a percentage of 68.75% are classified as very good. As many as 10 students with a percentage of 31.25% are classified as good.

So this android-based floor gymnastics assessment instrument product is included in the "feasible" category. This makes the product can be used to maximize students in learning

floor gymnastics and maximize exam preparation. The test results starting from product validation in terms of material, media to field trials can be described as follows: (1). Product Validation Testing by experts, the results of product validation testing by material experts with 11 assessment items obtained a percentage of 90% without revision with additional input of enlarged explanatory letters, the material menu explains in more detail, the qualification menu is replaced with provisions, the delivery of words is shortened and concise. These notes are listed for research that will be developed further. Then from the results of the media expert validation with a total of 17 assessment aspects which are divided into several assessments. Such as 4 points of material assessment aspects, 6 points of video assessment aspects, and 7 points of application assessment aspects. The total percentage for media results is 95% with revisions to include research biodata into the main menu display on the questions. The validation results from both material experts and media experts obtained a feasible category and can be continued for field trials. (2). Field trials, based on the results of product trials and assessment questionnaires filled out by teachers and students who participated in floor gymnastics learning in Class XI of Maitreyawira Private High School showed a total percentage of 94% for trials and 96% for large group trials with the category "feasible". Based on these results, the android-based floor gymnastics assessment instrument product is "feasible" for use. Based on the trial results, the final results of the student response questionnaire score obtained a positive response percentage of 96% and an average teacher response questionnaire of 95% which is very positive, so that overall the learning media that has been developed by researchers is known to be very good. Students and teachers also gave their opinions on this media that it makes it easier for students to imagine and understand the contents of the material they see, because the material presented becomes clearer and not boring when using it. Based on the trial, very good results were obtained, students felt happy and enthusiastic in learning the android-based floor gymnastics assessment instrument. Students' enthusiasm was seen when reading the material and seeing the explanation of the word assessment in the application, students became more enthusiastic in learning floor gymnastics and using the application as a benchmark for assessing the movements performed. This was evident from the student response questionnaire sheet with positive response results from all students with the lowest percentage of positive responses, namely 92%, and teacher responses with a percentage of positive responses of 95% which means a very positive response. Then a final revision was carried out to create the final product. Like other learning media, this android-based word assessment instrument is one of the interactive learning media that can be used in the process of preparing students in learning floor gymnastics and provides many benefits for the world of gymnastics. (3). Analysis of advantages and disadvantages, based on the research conducted, the use of android-based floor gymnastics assessment instrument products has several advantages, including: (a). Learning becomes more interesting and fun because the application used is an application that is new to students, making students interested and enthusiastic when using the product. (b) Time constraints in learning movements, floor gymnastics material can be overcome, because this product can be used at any time and is equipped with an assessment of the

learned word movements. (c) The use of the application is easy to learn. (d) This learning media can be used for other floor gymnastics learning. (e) The software can only be accessed on smartphones. (f). This learning media is in the form of a file so that it is easier for other students to use the media anywhere

In addition to having advantages, this Android-based floor gymnastics assessment instrument also has limitations, namely: (a). The application is not yet available in the app store, so iPhone users cannot access it because the application can only be used on Android. (b). Use of the application still requires an internet network so it cannot be accessed offline. (c). iPhone users cannot install the Android-based floor gymnastics learning application because iOS has its own software.

## CONCLUSION

From the results of the study on the Development of Android-Based Artistic Gymnastics Movement Assessment Application Design, it can be concluded that one of the uses of this assessment media is considered very helpful for students in its use. Because with the existence of Android-based floor gymnastics assessment media, it can help maximize student preparation in facing more complex floor gymnastics learning. Not only as a floor gymnastics learning media, this application also helps facilitate students, teachers, school supervisors or anyone who wants to learn floor gymnastics.

Both developments of Android-based floor gymnastics assessment instruments have been tested for validity by 90% of material experts and 95% of media experts. Good responses were also obtained from respondents and are suitable for use in floor gymnastics learning. This is evidenced by the results of field trials which obtained a percentage of 95% of teachers who were categorized as suitable.

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