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ADVANCES IN SOCIAL HUMANITIES RESEARCH

Development of Android-Based Learning Media Assisted by Appypie Pythagorean Theorem Material

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Abstract
Smartphones have influenced students' and teachers' information and communication, reduced student concentration and learning time. Interviews revealed that students preferred material presented via Android applications. This study aims to assess the feasibility of an Android-based learning media for the Pythagorean theorem, developed using Appypie, and to gather student responses. The research employs the R&D (Research and Development) method, following Thiagarajan's 4-D model: Define, Design, Develop, and Disseminate. Data collection involved interviews and questionnaires validated by experts and students. Results indicate the Android-based learning media is "very feasible," with media experts rating it at 80.77% and material experts at 94.44%. Student responses averaged 77.40% in small-scale trials and 76.80% in large-scale trials, both deemed "very feasible." The study concludes that the Android-based learning media for the Pythagorean Theorem is highly feasible and effective, enhancing student engagement and accessibility. It highlights the importance of integrating modern technology into education and suggests further innovations like animations and narrators to improve educational tools continually.

Keywords: Android-Based Learning, Appypie, Pythagorean Theorem Material

Introduction

In learning in schools, mathematics has an important role in improving the quality of education (Saha et al., 2024). In the 2013 curriculum, students are required to think creatively, innovatively, quickly, and responsively (Weinhandl et al., 2024). Unfortunately, students often consider math lessons difficult because mathematics is considered a scary subject. In addition, mathematics is also considered a boring subject. This happens because of the influence of the learning process in the classroom. So far, learning at school has only been with the Student Worksheet (LKPD) in the form of printed media. There are several factors that may make students feel afraid of learning mathematics, one of which is the boring learning process and tense situations in mathematics learning.

Technology-based learning media has not been widely applied in schools even though currently technology has developed rapidly, especially in the world of education (Mei, 2024). Learning media in the world of education is very important because it can

facilitate the learning process and increase students' interest in learning (Y. Xu, 2024). Technology users are not only in the world of education but have also influenced people's lifestyles and have become common among most Indonesian people. One of the technologies that has been widely used by students is mobile phones/smartphones (W. Xu, 2024). As stated on the website kominfo.go.id, the digital marketing research institute marketer predicts that in 2018, more than 100 million people will actively use smartphones in Indonesia. So, it shows that technology has a big role in Indonesian society (Yanti & Huda, 2020).

Learning media is made as attractive as possible so that students easily understand a material. One of the materials taught at the VIII junior high school grade level is the Pythagorean theorem material (Paul et al., 2023). This material is often used in everyday life. The material that is related to the daily activities of students who are oriented towards 21st-century competence is none other than the material of the Pythagorean theorem (Due, 2024; K & B, 2023). However, in reality, students think that this material is difficult to learn. One of the learning media that can be developed is the Android application learning media with the help of the appypie program.

According to Appypie, it is one of the online app builder programs that are already available on the internet (Amalia et al., 2020). In terms of its operation, appypie supports the creation of Android-based applications (Firdawati et al., 2021; Latifa et al., 2020; Paul et al., 2023). The features or icons that are available are also quite many and diverse so that they can be used by any circle. In line with the results of observations from the questionnaire analysis, information was obtained that students expect mathematics teaching materials presented in the form of smartphone applications, whereas as many as 63.3% like teaching materials presented in the form of smartphone applications (Carlsson & Willermark, 2024; Kurniawan, 2019; Maryamah, 2019, para. 7; Wang et al., 2024). This is supported by the results of an interview with a mathematics teacher at SMPN 2 West Karawang. The teacher said that many students in grade VIII already have mobile phones, so there is a great need for Android-based learning media. Therefore, the researcher suggested using Android smartphones as a learning medium, especially in the Pythagorean theorem.

This research develops Android-based learning media assisted by Appypie on Pythagorean Theorem material for grade VIII Junior High School/MTS students. This development only includes basic competency 3.6, which is explaining and proving the Pythagorean Theorem and the Pythagorean Triple. Research is limited to the stage of media development, feasibility tests by experts, and student response tests. The problem formulation includes developing appropriate learning media and determining the results of the student response test to the media.

The research aims to discover the development of appropriate learning media and students' responses to it. The benefits of research for students are that it facilitates the repetition of material and increases interest in learning; for teachers, it is a reference and knowledge in utilizing technology; and for researchers, it adds knowledge and motivation for innovation. The resulting product is an Android-based application with a ".apk"

format containing developer profiles, user instructions, KI/KD, subject matter, learning videos, and quizzes. The material includes the meaning of Pythagoras, the type of triangle, and the Triple Pythagoras.

Research Methods

This study uses the Research and Development (R&D) development method to produce Android-based learning media products on Pythagorean Theorem material for grade VIII Junior High School/MTS students. The development model used is a 4-D model (Define, Design, Develop, Disseminate), which has been modified to 3-D due to time, energy, and cost limitations. This model was developed by S. Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel. The result of this development method is a learning media product, and its effectiveness is evaluated.

The object of this research is an Android-based mathematics learning media assisted by the Appypie application. This media was developed to help students understand and prove the Pythagorean Theorem and the Pythagorean Triple. The data sources in this study consist of two types, namely primary data and secondary data. Primary data was obtained from the validation of media experts and material experts as well as student responses to the developed learning media. Secondary data were obtained from the literature relevant to this study.

The population in this study is grade VIII students of SMPN 2 West Karawang. The research sample was determined using the purposive sampling technique. Expert validators consist of media experts who have experience in Android application development and material experts who are mathematics teachers at SMPN 2 West Karawang. The trial was carried out in two stages: a limited trial involving 5 students and a further trial involving 8 students.

The data collection techniques used in this study include questionnaires and interviews. The instruments used are media expert validation sheets, material expert validation sheets, and student response questionnaires. The validation questionnaire of media experts and material experts is used to assess the feasibility of learning media from the aspects of display, programming, and content of the material. Student response questionnaires are used to assess the efficiency, ease of use, and level of practicality of the media.

Data analysis was carried out by calculating the percentage of scores from the validation and student response questionnaires using a formula adapted from Riduwan (2010). The average score percentage is then categorized into the following eligibility criteria: 0-25% (Not Feasible), >25-50% (Less Feasible), >50-75% (Feasible), and >75-100% (Very Feasible). Learning media is said to be feasible if the average score of the validation questionnaire and student response is >50%. By using this research method, it is hoped that Android-based learning media can be produced that is feasible and effective in helping students understand the Pythagorean Theorem. Validation from experts and student responses provides a solid basis for product revision and refinement before it is implemented more broadly.

Results and Discussion

Define Stage

Analisis Awal (Analysis Front-End)

The activity was carried out at this stage by conducting interviews with grade VIII mathematics teachers and students to find out the problems faced in the learning process at school. Based on the results of interviews with mathematics teachers attached to Appendix C.1, it is known that in the learning process at the school, Android-based learning media assisted by appypie has never been used. In addition, students also experience difficulties with the Pythagorean theorem material. One of the problems faced by students is constrained in the form of symbols such as the upright side and the oblique side. To overcome this, math teachers can try other methods or applications so that students can understand the symbols in the Pythagorean theorem. Therefore, it is necessary to develop an Android-based learning media assisted by appypie, Pythagorean theorem material called Math Pyppie (Pythagorean Appypie Mathematics).

Learner Analysis

Analisis Konsep (Concept Analysis)

The concept analysis at this stage is to determine KI (Core Competencies) and KD (Basic Competencies) based on the results of teacher interviews. The development of Android-based learning media is assisted by appypie to help students understand the Pythagorean theorem material. In this section, the KI and KD that have been planned and sorted are as follows:

a. Material : Teorema Pythagoras
b. Sub Materi : Definition of Pythagorean Theorem, Types of triangles, Pythagorean Triple
c. Basic Competencies : 3.6 Solve and prove Pythagorean theorem and Pythagorean triple

Analysis Tugas (Task Analysis)

The next stage after the concept analysis is the task analysis. At this stage, it is the result of analyzing core competencies, which are then described as indicators. This stage analyzes the student's main tasks so that they can achieve minimum competence and the material can be accepted by students.

Specifying Instructional Objectives

This stage is the result of combining concept analysis and task analysis. The activity carried out is to formulate indicators so that the results of this stage are indicators that are in accordance with the 2013 curriculum and refer to basic competencies.

Design Stage

Penyusunan Tes (Constructing Test)

At this stage, the researcher starts by preparing the material that will be displayed in the learning media. Create flowcharts and storyboards as the initial design of the app.

Media Selection

This learning media is Android-based, which is expected to make it easier for students to learn mathematics. Android-based learning media is developed using Pythagorean theorem material.

Format Selection

At this stage, the goal is to formulate an Android-based learning media design with the help of the appypie program for Pythagorean theorem material. This stage has several components, including menu features, backgrounds, and learning videos. In the selection of this format, there is software that the researcher uses to help create Android-based learning media assisted by appypie, namely PowerPoint 2016 and Adobe Illustrator. PowerPoint 2016 software is used by researchers to create learning videos, and Adobe Illustrator is used by researchers to create button features, backgrounds, and application logos. While the appypie software is used by researchers in preparing this Android-based learning media, the researcher's consideration in choosing this software is because it has a variety of complete features and is easy to use for making these teaching materials.

a. Font

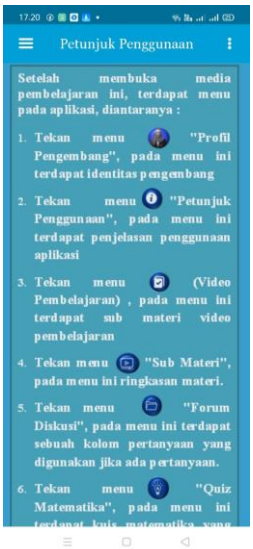
The typeface used by the researcher in the creation of this appypie-assisted Android-based application uses several typefaces, and its use lies in different parts, namely:

Table 1. Font

No.	Font
1	Comic Sans MS
2	Timen New Roman
3	Cambria Math
4	Constantia

b. Background Color

For the background color, the author uses only one color, namely light blue, as shown in the following documentation:



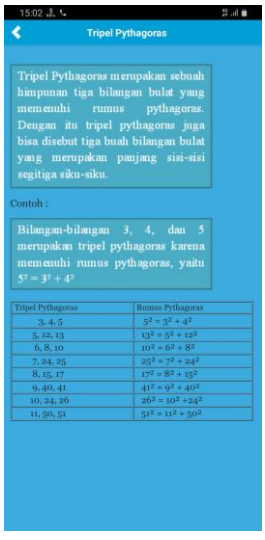
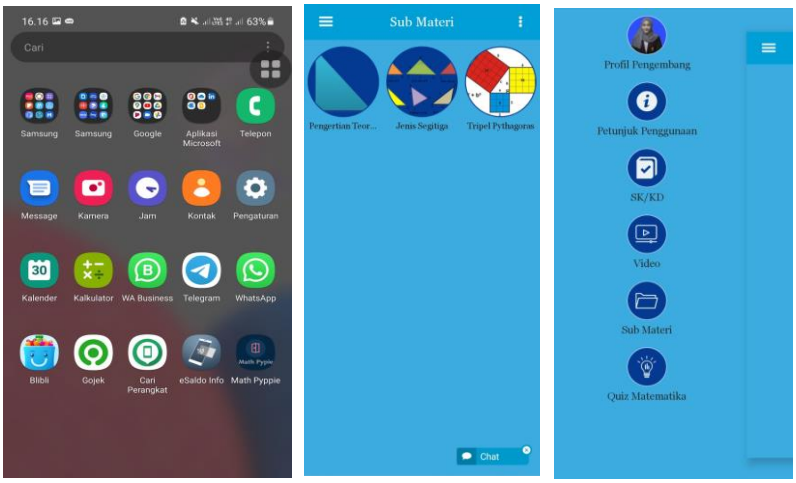


Figure 1. Background Color

c. Icon

The icons used in the application that the researcher developed on each button and the description were made by the researcher himself using Microsoft Word software.



Picture 1. Icon Display on Menu

d. Learning Videos

The Learning Video that the researcher uses is a video created with the help of PowerPoint 2010 software, a template from slidesgo.com, and recorded to make a presentation video, so the copyright fully belongs to the author.

Picture 2. Learning Videos on the App

Initial Design of Learning Media

All parts of the product, such as materials, backgrounds, button features, and learning videos, are collected and presented in the media. The initial design of Android-based learning media was based on the subject matter of the Pythagorean theorem, in which the core material and problem descriptions must be mastered. There is a learning

video that is expected to help learn the Pythagorean theorem. This presentation design is packaged in an Android application, the majority of which are now the primary needs of humans.

Development Stage (Develop)
Results of Creating a Math Pyppie Application

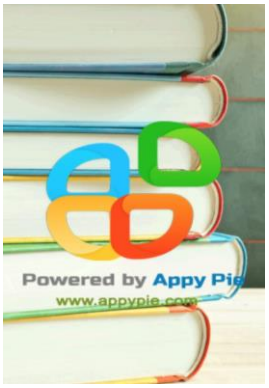


Figure 4. Application Home View

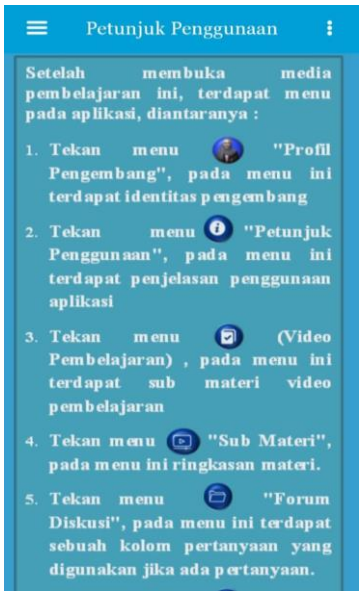
On the initial display, the name of the application is Math Pyppie. To display the main menu display takes a few seconds on the initial display. More details can be seen in the following picture:

Picture 3. Application Menu Display

The main menu display consists of 6 menus, namely, developer profile, instructions for use, SK/KD, videos, sub-material, and math quizzes. The "Developer Profile" menu aims to display Appypie's learning media creators. The Developer Profile menu looks like the following image:

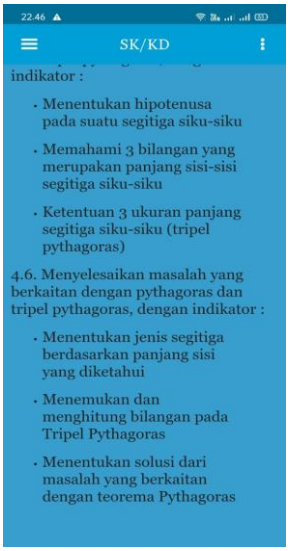
Picture 4. Math Pyppie Profile Menu Display

The "Instructions for Use" menu is displayed as a guide on how to use the math Apyppie application, as shown in the following image:



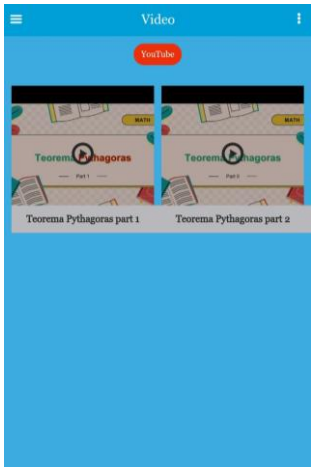
Picture 5. Display of the Instruction Menu

The KI/KD Menu describes Core Competencies (KI) and Basic Competencies (KD). It looks like this.



Picture 6. SK/KD Menu Display

The "Video" menu contains a learning video consisting of a video of the Pythagorean theorem. It is divided into 2 parts that are expected to make it easier for students to learn. The video menu looks like this.

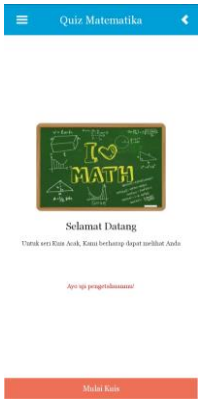


Picture 7. Video Menu Display

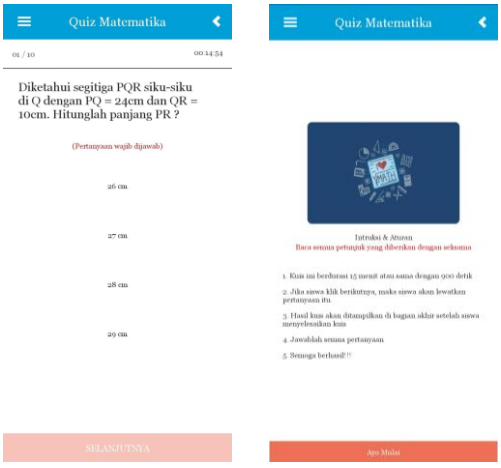
The "Sub Material" menu contains a description of the material, including submaterials, including the definition of the Pythagorean theorem, the type of triangle, and the Pythagorean triple. The following is a description of the submaterial.

Figure 8. Material Menu Display

The last menu is the "Mathematics Quiz" menu; on this menu, there are 10 quizzes that are given for 15 minutes. Mathematics quizzes are only used to support students' responses to using appypie-assisted learning media of Pythagorean theorem material.



Picture 9. Math Quiz View



Picture 10. Display of Mathematics Quiz Presentation

After the creation of this learning media is completed, it is then given to media experts and material experts with the aim of providing an assessment of the product

developed according to its use. The questionnaire used in the assessment of experts is made based on aspects and adjusted to the needs of the assessment. The questionnaire also provides a place to provide criticism and suggestions for product improvements or revisions.

Validation

Media Expert Validator Results

Android-based learning media assisted by appypie on Pythagorean theorem material needs to be assessed by media experts first before being given to students. The validator of media experts is Irnin Agustina Dwi Astuti, M.Pd, a lecturer at Indraprastha University. This media assessment prioritizes the aspects of presentation and display. The following is a table of the results of the validation of media experts:

Table 2. Media Expert Validation Results

No	Statement Items	Percentage (%)	Criterion
1	The choice of typeface is right	75	L
2	Font size according to the composition of the display	75	L
3	The image/video has a good display	75	L
4	The app's appearance is boring and unattractive	100	SL
5	The typeface used is difficult to read	75	L
6	Videos can play well	75	L
7	Images/videos have poor display quality	75	L
8	The application is not slow in operation	75	L
9	The font size is too small to read	100	SL
10	The background color is the same as the text color	100	SL
11	Attractive app view	75	L
12	Background does not interfere with readability in writing	100	SL
13	Video can't play	100	SL
14	In-app content sometimes takes a long time to open (stable connection)	75	L
15	Easy-to-use app	100	SL
16	Too much content, text, images, or videos	75	L
17	Easy to choose the material presentation menu	75	L
18	The file size of the app is not very large	75	L
19	The composition of many images, text, and videos is balanced	75	L
20	The menu is difficult to reach when it comes to choosing	75	L
21	Instructions for use are well explained	75	L
22	The use of terms, symbols or icons is appropriate	75	L
23	Still experiencing confusion in operating the application	75	L
24	Operation of the application requires special expertise	75	L

25	There are still many terms, symbols, or icons that are not appropriate in the selection	75	L
26	The app is large so it requires a large storage space	75	L
Average percentage (%)		80,77%	
Criterion		Highly Worthy	

Based on the table, the results of the assessment from the overall media experts were 80.77% with very feasible criteria. In addition to the assessment with the statements that have been presented, validators can also provide criticism, suggestions, or other inputs for the product to be used as a reference or basis for improving the product developed. In this case, the product developed needs to be improved according to the input provided by media experts. The following are the results of suggestions and inputs from validators:

Table 3. Enter Media Expert Validation

Validator	Critique/Input
Irnin Agustina Dwi Astuti, M.Pd.	Writing fonts on the material menu needs to be given a background. The video start menu display has been improved to 1 line

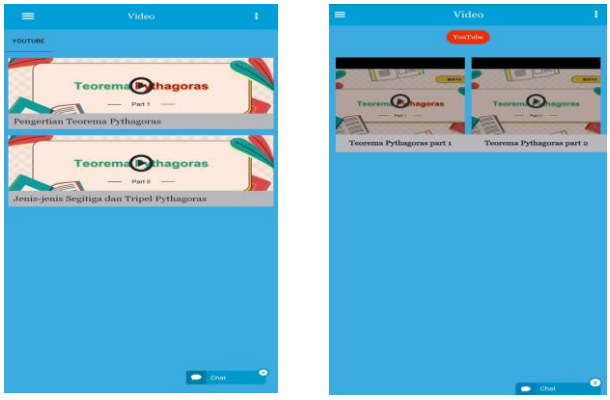
Based on the input provided by media experts, the researcher revised the learning media developed.

Material Menu

Based on the input provided by the media expert, the font writing on the material menu needs to be given a background so that it looks neater. Here is the display of the revised results on the material menu.

Menu Video

The next input given in the video menu is to improve the appearance of the video's initial menu, which was initially two lines into one line. The "Youtube" writing display has also been improved to red. The video menu display is as follows.



Picture 113. Comparison of Video Menu Views

After the product has been developed and revised, an assessment is carried out by material experts.

Material Expert Validation Results

The SMPN 2 West Karawang mathematics teacher, Mr. Wendi Rosandi, M.Pd, assessed material experts. Material experts validate the feasibility of material experts whose sub-material is contained in the product. The goal is to obtain information, input, and responses regarding the feasibility of the product used in learning. The table of the material experts' assessment results is as follows.

Table 4. Material Expert Assessment Table

No.	Statement Items	Percentage (%)	Criterion
1	The material is in accordance with the existing basic competencies	100	L
2	The material presented is clear	100	L
3	Images/videos are appropriate to clarify the material presented	100	L
4	The material presented is difficult to understand	75	SL
5	Presentation of sequential material	100	L
6	The image/video is not clear enough to look	100	L
7	The media used is in accordance with the material to be delivered	100	L
8	Examples are considered inappropriate to explain the content of the material	75	L
9	The content of the material in the application has not met the demands in the basic competencies	100	SL
10	The material presented was confusing because it was not in order in the delivery	100	SL
11	The discussion of the material is in accordance with the development of the cognitive level of students	75	L
12	The content of the material in the application is not in accordance with the learning objectives	100	SL
13	Examples according to the material presented	100	SL
14	The material to be delivered is considered inappropriate with the use of media	100	L
15	Images/videos complicated the understanding of the material	100	SL
16	The content of the material is in accordance with the learning objectives to be aimed at	100	L
17	The image/video is of good quality	75	L
18	The content of the material is difficult to understand	100	L
Average percentage (%)		94,44%	
Criterion		Highly Worthy	

The finished product is then continued with validation by material experts. The assessment of this material expert has two aspects: presentation and content. It consists

of 18 statements that cover these two aspects. From the table above, the results of the assessment of material experts were obtained, namely 94.44%, who met the criteria of being very feasible.

Validators can assess the products developed and provide feedback and input on the learning media developed. The results of the validator input can be a basis for revising learning media products. The following is input/comment from material expert validators.

Table 5. Enter Material Expert Validator

Validator	Enter/Comment
Wendi Rosandi, M.Pd	Very good application nowadays, highly recommended for other subject matter

Based on these inputs/comments, there has been no revision from the material expert validator, so the product has been developed. If the revision of the results of the media validator has been completed, the researcher will move to the next stage, which is to provide a response questionnaire to students to find out the students' response to Android-based learning media assisted by appypie.

Limited Trial

This limited trial is a trial conducted with a small group. The small group trial here is a trial given to 5 students. This trial was held on April 19, 2022. The trial given to 5 students involved grade VIII students of SMPN 2 West Karawang. The small group trial aims to determine the response of students to Android-based learning media assisted by appypie theorem material as a result of the small group trial as follows.

Table 6. Limited Student Response Results

No.	Student	Total Score	Maximum Score	Percentage (%)	Criterion
1	P1	85	104	82%	SL
2	P2	75	104	72%	L
3	P3	80	104	77%	SL
4	P4	82	104	79%	SL
5	P5	80	104	77%	SL
Total Percentage of All Respondents (%)				387%	
Average Percentage (%)				77,40%	
Criterion				Highly Worthy	

Table 7. Enter Student Responses

Student	Enter/Comment
Aulia Salamah	"I think the application is very helpful and easy to learn in working on the Pythagorean theorem, but my suggestion is to multiply/vary the questions again so that we can better understand the Pythagorean concept."

Based on the results of students' responses to Android-based learning media assisted by appypie, Pythagorean theorem material in a limited test product trial with a limited number of statement items of 18, the results of the criteria were obtained, which were very feasible with an average percentage of 77.40%.

Wider product trials

The next trial is a large-scale trial with a total of 8 people. This trial was carried out after a small group trial. Wider or large-scale trials are carried out online because they are adjusted to learning conditions during research that is still being conducted online. A wider product trial was carried out on April 28, 2022. The following are the results of the large-group trial:

Table 8. Wider Student Response Results

No.	Learners	Total Score	Maximum Score	Percentage (%)	Criterion
1	P1	75	104	72.12	L
2	P2	79	104	75.96	SL
3	P3	87	104	83.65	SL
4	P4	74	104	71.15	L
5	P5	69	104	66.35	L
6	P6	80	104	76.92	SL
7	P7	84	104	80.77	SL
8	P8	91	104	87.50	SL
Total Percentage of All Respondents (%)				614,42%	
Average Percentage (%)				76,80%	
Criterion				Highly Worthy	

Table 9. Include a broader Student Response.

Student	Enter/Comment
Safitri Assyfaa Afifah	."In my personal opinion, the application is quite good. The selection of words and sentences that are quite easy to understand in the application helps in understanding the material regarding the Pythagorean theorem."

The results of the wider product test were obtained with an average percentage of 76.80%. Therefore, the results state that students' response to Android-based learning media assisted by appypie is very feasible to be used in learning.

Development of Android-Based Learning Media Assisted by Appypie Pythagorean Theorem Material

The research conducted aims to produce an Android-based learning media product assisted by appypie Pythagorean theorem material. In addition, the goal is to find out the students' response to the product developed. Android-based learning media assisted by appypie on Pythagorean theorem material is used with internet access. This product can be contained in a smartphone. This is a form of utilizing technology optimally in the learning process that can be used anywhere. The use of technology in the world of

education, such as smartphones, which are used as learning media, can improve education. The stages that have been passed by researchers to develop learning media products as a process that must be carried out for research have been carried out. The process and stages consist of the validation of media experts and material experts. After going through this stage, it produces an assessment that states whether the researcher can continue the research or needs improvements in the product before continuing the trial with students. The results of the assessment and improvement from the experts were followed by small-scale student trials and then large-scale trials.

This study uses the R&D (Research & Development) research method with Thiagarajan's research model or procedure, namely the 4D development model (Define, Design, Development, Disseminate). According to the 4D procedure, the initial stage in research is the definition stage. This stage conducts pre-research at SMPN 2 West Karawang by paying attention to students' character, the media used, and so on.

Facts in the field based on the results of interviews on the needs of students and mathematics teachers in grade VIII in pre-research at SMPN 2 West Karawang were obtained. The learning resources used in the school were only package books and learning videos through YouTube, and learning was carried out online via Zoom. With this, students have a poor response to mathematics material.

Furthermore, the researcher conducted a needs interview with students with 10 questions. As a result, the researcher obtained information that students prefer to learn if the media used is in the form of an application. This is because it makes students more fun in using mathematics learning media in the form of Android applications. This also supports the number of students who already have smartphones so that they can easily use mathematics learning media in the form of Android applications. It is hoped that the existence of learning media in the form of applications can be used optimally in learning so that students have an interest in learning mathematics anywhere.

The next stage is design or design. In this stage, the researcher designs the product according to the results of the needs analysis obtained previously during the initial stage of the research. This stage produces instruments in the form of questionnaires of media experts, material experts, and student responses. The questionnaire of media experts and material experts aims to determine the feasibility of the product developed. Questionnaires are given to students to find out their responses to learning media or products that have been developed.

This Android-based learning media, with the help of appypie Pythagorean theorem material, is a mathematics learning media or product developed in this study. The material used is the Pythagorean theorem material, which is limited to the sub-material of SMPN 2 West Karawang grade VIII. Learning media in the form of applications have their own characteristics that are felt to be fun for students.

Next is the development stage. After designing the product, the next step is to make the product based on the previous design. Designs that help Microsoft PowerPoint software, Microsoft Word, and online templates, which have been made in the form of menus or application icons that are designed according to the results of the interview

needs, are put together into a mathematics learning media product that has been completed with the help of appypie and is ready to be given to media experts and material experts. This application consists of (1) Profile Menu, which is the researcher's personal data, (2) Usage Instructions Menu, in which there is a description of how to use the application, (3) KI/KD Menu, in which there is a description of basic competencies and core competencies, (4) Video Menu, and there are two learning videos, namely the Pythagorean theorem sub-material, (5) Sub-Material Menu, there is a Pythagorean theorem sub-material, (6) Math Quiz, a math quiz consisting of 10 questions with a completion time of 15 minutes.

After completing the creation of Android-based mathematics learning products or media, then the product is validated by media experts and material experts. The validation aims to obtain input and responses from media experts and material experts. The selection of validators is determined according to their expertise in the field.

Validation is carried out by media experts. The results of media experts' input then become product improvements. Furthermore, an assessment is given to determine the feasibility of the product developed. The average percentage result from the assessment of media experts is 80.77%, with the criteria of "very feasible." Meanwhile, the assessment of material experts is an average percentage of "94.44%" with the criterion of "very feasible." Based on the results of the stages that have been carried out by the researcher, the final result of this study is an Android-based learning media assisted by appypie. Pythagorean theorem material is suitable for use in learning. The presentation of learning media in the form of applications can make it easier for students to learn anywhere. In addition, the learning media is equipped with learning videos and Pythagorean theorem sub-material so that there is a positive response to the learning media in the form of applications. In line with the results of research conducted by learning media, appypie is very feasible or effective for use in learning (Hidayati, 2021).

Test Results and Student Responses

The existence of the Covid-19 pandemic encourages teachers to improve their skills in designing technology-based learning. In designing an Android-based design or learning, you need a tool or a media that can make it easier for students to learn. Appypie is one of the platforms that allows editors or creators to create an application easily without having to code. With appypie, you can use its features it, one of which is such as entering materials and learning videos. Of course, the features can make the learning process easier for students, especially the Pythagorean theorem.

The findings obtained by the researcher showed that Android-based learning media assisted by appypie Pythagorean theorem material is a new thing in schools. After validating media and material experts, the researcher then provides a response questionnaire to the students. At this stage, it consists of two trials, namely a limited test of 5 students and a wider product trial consisting of 8 people. In these two trials, student response questionnaires were given online via WA (WhatsApp) with a Google form. The results of the student response in the limited trial stage were an average percentage of 77.40%, with the criteria for student response to be very feasible. Then for the results of

the students' response in the wider trial or actually the average percentage is 76.80% with very feasible response criteria. This is in line with research conducted by (Hidayati, 2021) entitled Development of Android-based Learning Media using Appypie on Trigonometry Equation Material, concluding that learning media using appypie is very feasible and effective to be used in learning.

Conclusion

Based on the results of the research on the development of Android-based learning media assisted by Appypie on the Pythagorean Theorem material, it can be concluded that this study successfully uses a 4D development model (Define, Design, Develop, and Disseminate) with the stages of definition, design, development, and dissemination that have been completed. The results of the product assessment showed that the learning media received an average percentage of 80.77% from media experts with the criteria of "very feasible" and 94.44% of material experts with the criteria of "very feasible". The response of students also showed very decent results, with a percentage of 77.40% for small-scale trials and 76.80% for large-scale trials. For further development, it is hoped that Appypie's Android-assisted learning media can be equipped with animations and narrators in videos to increase the effectiveness of technology-based learning. This research still has shortcomings and limitations, so it is hoped that the next research can add more material.

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