

## ANDROID-BASED MOBILE LEARNING MEDIA WITH CHARACTER

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### Abstract

This study aims to produce a android-based mobile learning media with character. The research method is a research and development method with a 4D design which is limited to Define, Design, and Develop. The subjects in this study were students of class VIII of Public Junior High School 10 Sungai Kakap as many as 14 students. The instruments were validation sheets, questionnaires of teacher and student and posttest questions. Learning media is said to be valid, practical and effective if the percentage is above 60%. Based on the results of the research, it is found that the android-based mobile learning media is valid, practical and effective. The validation of it has a validity level of 90.53% with very valid criteria, while the practicality level of learning media is 90.16%. with very practical criteria, and the effectiveness of learning media is 85.71% with very effective criteria.

**Keywords:** Android, character, mobile learning.

### Abstrak

Tujuan penelitian ini untuk menghasilkan media pembelajaran aplikasi mobile learning bermuatan karakter dan berbasis android. Metode penelitiannya berupa metode penelitian dan pengembangan dengan desain penelitian 4D yang terbatas pada Define, Design, dan Develop. Subjek dalam penelitian ini adalah siswa kelas VIII SMP Negeri 10 Sungai Kakap sebanyak 14 siswa. Instrumen penelitian berupa lembar validasi, angket respon, dan soal posttest. Media pembelajaran dikatakan valid, praktis dan efektif jika persentasinya di atas 60%. Berdasarkan hasil penelitian yang telah dilakukan, diperoleh bahwa media pembelajaran aplikasi mobile learning bermuatan karakter dan berbasis android tergolong valid, praktis serta efektif. Validasi media pembelajaran mobile bermuatan karakter dan berbasis android memiliki tingkat validitas sebesar 90,53% dengan kriteria sangat valid, sedangkan tingkat kepraktisan media pembelajaran sebesar 90,16%. dengan kriteria sangat praktis, dan tingkat keefektifan media pembelajaran sebesar 85,71% dengan kriteria sangat efektif.

**Kata kunci:** Android, karakter, mobile learning.



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## INTRODUCTION

The objectives of mathematics education in the Regulation of the Ministry of Education of the Republic

of Indonesia No. 22 of 2016 are: understanding the content of mathematics, explaining the relationship between content and applying the

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content in solving existing problems; solving an existing problem includes the ability to study the problem, form a model and explain the resulting solution; and have an attitude of respect for the use of mathematics in everyday life in which there is a desire, interest and concern in studying mathematics as well as a diligent and tenacious attitude to appear confident in solving problems (Pendidikan & Indonesia, 2016). From the purpose of learning mathematics, mathematics is a very important and interrelated subject. In addition, it can be used as a tool to find and solve various existing problems. But there are factors that cause students difficulty to understand the mathematics, material and the media used are less attractive to students. As a result, it is very difficult for students to understand the material, so this can result in a lack of interest and enthusiasm for students in understanding mathematics learning (Lado et al., 2016).

Low mathematics learning outcomes are not only caused by difficult mathematics, but also due to: the students themselves, the teacher, the learning approach, the media used and the learning environment that are interconnected with each other which makes mathematics difficult to understand (Lado et al., 2016). Based on this, it takes good thinking and skills in solving the problems or problems presented so that students can assume that mathematics is not a difficult subject but a fun lesson if we know how to solve it. In the learning process, mathematics are not only viewed in terms of cognitive abilities, but also in the learning process the most important things are student attitudes and behavior or student character. Therefore, learning mathematics can be seen as a state of values related to character education, so

that in learning mathematics students are expected to develop good characters, especially from within students.

Based on the results of an interview on April 26, 2021, with a class VIII mathematics teacher at SMP Negeri 10 Sungai Kakap, Mrs. Nevi Hadriana explained that the character possessed by the students here is quite good, but there are some that are still lacking or obstacles, especially in discipline and honesty. For example, in doing assignments, many students cheat, which makes character values, especially the value of honesty when studying, very difficult to realize. Character is a good habit that every human being has (Rahmawati, R Wijayanti, 2020). Character is a value that exists from a person. Character development in schools is needed considering the current condition of students whose character values are getting worse, one of which is in learning mathematics (Anugraheni, 2018; Fauziyah & Jailani, 2014; Kamaruddin et al., 2014; Permatasari et al., 2020).

Students are expected to be able to take advantage of existing technology as well as possible. Especially now that we are experiencing the Covid-19 pandemic which causes changes in learning into online learning using technology (Salsabila, dkk, 2020). In the learning process, the most important thing is the teacher and the learning media. With the use and selection of the right learning media by a teacher, it will certainly affect the process and results of the learning carried out (Salsabila, dkk, 2020).

Learning media is one of the factors affecting student learning outcomes, because through the media learning messages can be delivered. To

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produce effectiveness in learning and teaching, a design is needed in making media so that the media can make students feel interested and easy to understand and motivate students to be more enthusiastic in learning (Indaryati, 2015). From the results of the pre-research, it can be concluded that some students still do not understand during the learning process because media is not attractiveness. In addition, the learning media used are still using worksheets and textbooks, and have never used mobile learning media which contain characters. Based on that, one solution that is able to overcome these obstacles is the use of mobile learning media.

Using of mobile learning media can also make it easier and help an educator in teaching, which will increase student motivation in learning because the media is made as attractive and as good as possible which contains character values and ultimately makes students feel comfortable and easy to understand. Based on previous research that the learning media used is very influential for students (Ariyanto et al., 2020). This study results indicate that students feel motivated and play an active role in learning. Therefore, researchers want to redevelop modified mobile learning media using Android.

Android is a operating system of Linux-based mobile developed by Androin Inc and later acquired by Google (Ibrahim & Ishartiwi, 2017). The development of it has been done before, developing contextual-loaded android-based learning media to improve problem-solving skills (Yani et al., 2021). The difference between both lies in the application used before explored on Android. If previously using flash media macros but now using power point. In addition, there have

been studies developing android-based learning media, such as the study of Nuraeni et al. (2020), but the difference lies in the content of the material and developed media. Liang et al. (2014) proposes android media so that it can be used in learning mathematics, especially in using applications such as MATLAB.

A developed media has the advantage that it includes a variety of colorful and illustrated displays: content, quizzes, exercises, and so on. This is very interesting because it can make students understand the material better, be enthusiastic and motivated in learning, so that students feel happier and happier when learning. This study aims to produce android-based mobile learning media.

## RESEARCH METHOD

This research method is research and development methods with design of 4D. Thiagarajan (Sugiyono, 2015) suggests that the research and development steps are abbreviated as 4D: Define, Design, Develop, and Disseminate. However, in this study, the 4D development model was modified into 3D without Disseminate. This refers to the initial purpose of the research, which is to develop appropriate media and get a good response which is contained in the third step of developing this model, develop.

Define stage aims to get information about the problems in SMP Negeri 10 Sungai Kakap so that learning media needs to be developed. Then design the media according to the needs that exist in the field (Design). Furthermore, validating and testing the learning media developed (Develop).

The product trial subjects in this study are eighth class students of Public Junior High School 10 Sungai Kakap, Kubu Raya Regency, West Kalimantan.

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Data collection tools are tests and questionnaires. The test is used to determine the product effectiveness and a questionnaire is used to determine the validity and practicality of the product. The data analysis technique used

descriptive statistics with criteria adapted from Bintiningtiyas (Hodiyanto et al., 2020) in Table 1. The learning media is valid, practical and effective if the result of the last percentage is above 60%.

Table 1. Product percentage criteria

Percentage	Criteria		
	Validity	Practicality	Effectiveness
80% < skor ≤ 100%	Very Valid	Very Practical	Very Effective
60% < skor ≤ 80%	Valid	Practical	Effective
40% < skor ≤ 60%	Quite Valid	Quite Practical	Quite Effective
20% < skor ≤ 40%	Less Valid	Less Practical	Less Effective
0% < skor ≤ 20%	Invalid	Impractical	Ineffective

## RESULTS AND DISCUSSION

This research develops mobile learning media with character and android based learning. The stage carried out only reached the 3D, because time and material were very limited. These are processes that have been carried out and obtained are as follows:

### 1. Define

In the initial analysis, what the researcher did was determine the problems faced by a teacher and student, especially in the current situation that is experiencing the covid-19 pandemic. Researchers conducted pre-observations and directly interviewed a mathematics teacher at of Public Junior High School 10 Sungai Kakap. From these interviews, information was obtained that the current situation of learning is less effective so that students' understanding in learning is reduced. Especially when working on story questions, students still need to be guided in solving these problems. Furthermore, the character possessed by students is quite good, but there are still some obstacles, the lack of

students' honesty in doing test questions and assignments.

Based on the results of the pre-observation, it can be concluded that in the current situation the learning carried out is less effective and there are still some characters that students lack. To overcome the problems faced, the teacher must use learning media that can motivate and assist students in overcoming difficulties when learning, then the teacher must instill character values into learning media and also must have the right learning strategy.

The learning media that the researchers chose to overcome the difficulties of teachers in teaching at a time like this was a mobile learning media that was characterized by character and based on Android. This media is expected to increase motivation. The character in the learning media aims to remind students to always have good attitudes and behaviors that must be instilled in each of them both in the school environment and outside.

### 2. Design

It designs products that is in accordance with the problems gotten.

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The result is a learning media design as shown in Figure 1, Figure 3, and Figure 5 (the media before validated).

### 3. Develop

It is a stage to revise in order to produce products that are valid, practical, and effective.

#### Expert Validation

This validation was carried out before media tested and then the validation results were used to revise the initial product. The validation process was carried out by 3 experts: two mathematics education lecturers, and a lecturer in information and communication technology (ICT) education at IKIP-PGRI. Their suggestions are used for revising the mobile learning media so it is valid and can be tested on subjects.

#### Expert of Material

Material experts provide an assessment from the feasibility aspects of content, presentation, language, and character assessment. The validation results from three experts obtained an average of 87.73% with very valid criteria, then media is feasible. This mobile learning can be used after revision. The suggestions given by experts are that there is a revision in the example of a two-variable system of linear equations. According to validator II, the question is not in accordance with the daily contextual context of junior high school students as shown in Figure 1 (before the revision) and Figure 2 after the revision.



Figure 1. Before Revision of Sample Questions



Figure 2. After Revision of Sample Questions

#### Media Expert

Media experts provide an assessment of mobile learning media with character and Android-based content from the software engineering aspect, the visual display aspect and the character value aspect. The validation results from three media experts obtained an average of 93.33% with very valid criteria, so mobile learning media is feasible. There are some suggestions given by experts, they are:

1. There is a revision to the sound of the music. According to validator I, there is no music sound button for on-off if students want to turn on the

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sound or turn off the sound while studying as shown in Figure 3 (before the revision) and Figure 4 (after the revision).



Figure 3. Before revise on-off button on music



Figure 4. After revise on-off button on music

6). The full results of expert validation can be seen in table 2.



Figure 5. Before revision of media display revision

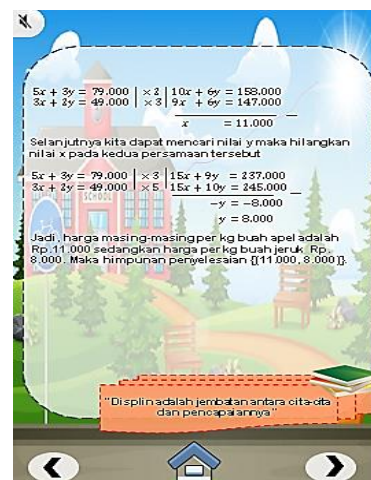


Figure 6. After revision of media display revision

2. There is a revision to the media display section. According to validator II too much use of color, especially in the material and sample questions because the background is already blue so the color is too flashy, choose soft and soft colors so that the writing is easy to read, pay attention to the background color with the display, and add motivational words according to character values (Figure 5 and Figure

Table 2. Summary of expert validation results

No	Expert	Percentage	Criteria
1	Material	87,73%	Very Valid
2	Media	93,33%	Very Valid
<b>Average</b>		<b>90,53%</b>	<b>Very Valid</b>

### Product Trial

The next step is product testing to determine the practicality of a media developed at Public Junior High School 10 Sungai Kakap. The test results are as follows:

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### Practicality

The practicality assessment was filled by the teachers and 14 students of class VIII B regarding their responses to the mobile learning application used during the learning process. Their suggestions will be considered in revising mobile learning. The results of the percentage of questionnaires can be seen in the Table 3.

Table 3. Results of the student and teacher response

No	Response	Percentage (%)	Criteria
1	Teacher	90,00	Very Practical
2	Students	90,32	Very Practical
<b>Average</b>		<b>90,16</b>	<b>Very Practical</b>

Based on the results of the teacher's and student's response questionnaire to the learning media used, it shows that the level of practicality of mobile learning media with character and android-based content has an average of 90.16% with very practical criteria.

### Effectiveness

The effectiveness of mobile learning learning media is seen from the posttest results that have been done by students. The posttest questions are 5 questions. Based on the results of the posttest calculation, there were 12 students achieving minimum completeness criteria and two students are not. From the results of the posttest, it can be concluded that a media developed obtains an effectiveness index percentage of 85.71% with very effective criteria.

### The Final Product

After testing the product, the Mobile Learning media containing characters and based on Android is ready to be packaged to become the

final product. The mathematics teacher at the test site did not give any advice. She only thinks and can help students to better understand the material that is related to everyday life, especially on the material of a two-variable linear equation system. Thus, Android-based and character-laden Mobile Learning media can be re-shared via links with supporting platforms such as Bluetooth/Share It, Google Drive, and WhatsApp and can be installed offline.

### DISCUSSION

Development of android-based and character-laden mobile learning media uses 4D: define, design, develop, and disseminate. However, in this study only reached a stage of develop. This refers to the initial purpose of the research: developing valid, practical, and effective products. In addition, this research didn't reach the stage of disseminating of the product because time and material were very limited.

The define identifies needs based on an analysis of the problems found, what problems faced by teachers in determining better learning media. Problems faced by teachers and students during the teaching and learning process were obtained during interviews with teachers regarding problems in learning process. Especially in covid-19 pandemic which makes students only go to school two times a week and this of course causes students to be given more assignments by the teacher so the teacher needs to choose the use of learning media that can help students in learning mathematics. Therefore it is needed to develop a mobile android-based learning media. This is in accordance with research conducted by Rachma et al. (2020) that the use of mobile learning media can improve student understanding.

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The second stage design products that are developed according to the problems obtained at the definition stage: validation sheets and response questionnaires of teacher and student. It is carried out to develop products revised based on expert suggestions. Then it is tested on research subjects. However, because of cost, this research only reached the develop stage, not to the dissemination stage.

According to Nievevan (Hodiyanto et al., 2020) that in addition to producing a product, you must also pay attention to the quality of the product produced through testing validity, practical, and effectiveness of product. By knowing the quality of the resulting product, it can be used by a wider environment. In this research, the product produced is a mobile learning learning media that contains characters and is based on android.

The validity of the mobile learning media is validated by experts as well as media experts using a Likert scale with a range of 81%-100% indicating very valid criteria. Analysis of mobile learning media validation by material experts consists of 4 aspects: feasibility of content, presentation feasibility, language feasibility. Percentage average of character aspects is 87.73% with very valid criteria so that the mobile learning media based on android with characters is feasible to be used.

The average percentage of media expert validation is 93.33% with very very valid criteria. So that the mobile learning media containing characters and based on Android is feasible to be used. The average of percentage of experts of media and material obtained an of 90.53% with very valid criteria. This is in accordance

with research Ariyanto et al. (2020) which developed a mobile learning game based on a contextual approach. The results of the average of material validation from mobile learning media were 87.50% with very good criteria, while the average of media validation is 83.33% with very good criteria. So that the developed character-based and android-based mobile learning media can be used very well during the learning process. Likewise, the android-based learning media developed by Nuraeni et al. (2020) classified as valid.

After completing the validation, the next stage tests it. It aims to determine the practicality of Android-based and character-loaded mobile learning media and to determine the effectiveness after using it. The average of response is 90.32% from students with very practical criteria involving 14 grade VIII students at Public Junior High School 10 Sungai Kakap, and 90% while from the teacher's response with very practical criteria. The result of average of the two percentages (the response of teacher and the students) is 90.16%. This is supported by the research of Firdausi & Santosa (2016) who developed a mobile learning learning media assisted by an android smartphone, it was found that the results of the questionnaire in the study were seen in the student's assessment, which was stated to be good with a percentage of 80.50%.

To find out the effectiveness of media, it is done by giving a posttest containing 5 questions. The question was given to subjects, 14 grade VIII students at Public Junior High School 10 Sungai Kakap. The posttest results of 14 students are 12 students above the minimum completeness criteria and 2 students below the minimum completeness criteria so that the mobile

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learning media with character and android-based content could be said to be effective because of 85.71% of students achieve it. This is supported by Agustin & Wintarti (2021) which developed an Android-based mobile learning learning media which stated that learning media using mobile learning met the effective criteria based on the test result of 88.89%. So that the product developed in this study is feasible because it has gone through the stages of testing its validity, practicality and effectiveness.

In today's era the use of technology is widely used by everyone, both adults and children. Especially nowadays, students use handphone only for personal purposes such as playing games. This makes the morale of the students decrease and makes the character lack. Hendriana & Jacobus (2017) states that moral quality is important in Indonesian human life today, especially among students. Schools are obligated to instill and develop good values and help students shape and build their character with good values. Therefore we need a media that utilizes technology but in it displays character values so that the character of the students does not decrease. Therefore, the mobile learning media created was collaborated with characters and based on Android, which aims to help improve students' character.

In addition, students can understand the material and examples of questions easily related to everyday life which includes the character values contained in the display of pictures, materials, sample questions, and motivational words. In addition, utilizing a media is very good, especially in utilizing mobile learning media, this is supported by Setyadi (2017) that mobile learning is defined as

a facility that provides general information to students and can provide learning materials that are easily accessible anywhere and anytime with an attractive appearance, while Android is the right operating system to be used for the development of mobile learning. This is because of Android of open source and it can be installed easily. Character education inculcates character values to students like knowledge, awareness, or willingness and action to implement these values, both towards God, oneself, fellow environment, and nationality so that become good human (Citra, 2012). The character values in this study are religious, honest, disciplined, hard working, and responsible.

## CONCLUSION AND SUGGESTIONS

Based on the results and discussion that have been described, it can be concluded that mobile learning media contains characters and based on android is very valid, very practical, and very effective. The suggestions from the research are: (1) Character-loaded and android-based mobile learning media can be continued by other researchers to the dissemination or dissemination stage, so that the quality of mobile learning containing characters and based on Android is truly tested in terms of utilization. (2) The android-based and character-laden mobile learning media that is developed also needs other materials and can also use other methods, models, strategies, and approaches according to the needs in the field.

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