



## Development Application 'Calistung' As Media Learning Games Education Based Android For Child Age Early

Ina Rosmalita

Universitas Tanjungpura Pontianak

Email: [Inaptk78@gmail.com](mailto:Inaptk78@gmail.com)

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### ABSTRACT

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Development of an Android-Based Educational Game to Improve Reading, Writing and Counting Skills for 5-6 Year Old Children at the Cahaya Bunda Kindergarten at IT Cahaya Bunda Ketapang. This study aims to produce an Android-based educational game for early childhood. This study uses the Research and Development method with the ADDIE development model. Data collection techniques using a questionnaire. The results of the validation of the development of android-based educational games are suitable for use with the average result of Aiken's V by material experts, which is 3.84 and with the average result of Aiken's V by media experts, which is 3.88. The practical results of android-based educational games are said to be very practical with an average percentage result of 3.83, which is very practical with the educational game Calistung, the android application is very feasible to use. It can be concluded that android-based educational games to improve the reading skills of children aged 5-6 years in Ketapang are valid, practical, and effective..

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### 1. Introduction

The development of advanced facilities and services from this technology can already be felt in the world of education as a means of learning media in the process of implementing teaching and learning starting from early childhood education (PAUD) to higher education. Growth and development in childhood is very important in human life. At this time, children will face new tasks and have certain skills. Therefore, the continuity of the child's development process really needs to be considered, ranging from cognitive, motor, sensory, physical, language, to emotional development. The cognitive development of a child is seen from the ability to understand something.

Chandrawaty (2020) said that the level of achievement of cognitive development in children aged 4 to 6 years includes knowing the concepts of many and few, counting many objects from one to ten, matching numbers with number symbols, recognizing ABCD letter patterns, and representing various kinds of objects. in the form of pictures or text. To overcome such problems, learning media is needed which in the delivery of the material can help early childhood in understanding the material presented. To generate and increase student learning motivation so as to create an effective learning atmosphere, an Android-based calistung application learning media was made which is equipped with animation, images and sounds. For this reason, Android educational games can be an alternative to developing applications as a medium for learning to read, because educational games are made not only for learning media but also for entertainment.

Therefore, to increase students' learning motivation, it is necessary to have interesting learning media facilities. Likewise in Early Childhood Education (PAUD), learning media that have the concept of playing and learning need to be applied. This was conveyed by the Minister of Education and Culture, Nadiem Makarim, that educators in PAUD institutions and parents must understand the concept of playing and learning (Maulipaksi, 2019). Regarding cognitive abilities in



early childhood, the Minister of Education and Culture added that the ability to read, write, and count (calistung) is not a main target. It is true that early childhood (4–6 years) is not required to be able to read and write, because these skills are only taught at the elementary level. Early childhood still needs to play activities, so it is feared that if calistung is given to early childhood it can hamper the development of children's potential in the future. However, the form of calistung learning in early childhood can be carried out by referring to the general characteristics of kindergarten, namely playing as the main activity (Asiah, 2018; Lutfatulatifah & Yulianto, 2017). Therefore, cognitive learning in children can be done by using an informal approach, such as reading a story book while looking at the pictures and writings that are being read and playing guessing letters.

In addition, there are many game features that are not only for playing entertainment, but there are already many games to hone thinking and logic that can introduce material to make it more interesting to be accepted and understood, especially by children who are still at an early age in the Golden Period. ) their brain development. Therefore, in this study, calistung learning media was developed with the hope of not only improving children's cognitive abilities but also attracting interest in early childhood learning. Especially with the current pandemic conditions, the learning given to early childhood must be interesting so that children don't get bored easily in learning. The users of this learning media are children with an age range of 5 to 6 years

## 2. Method

This study uses a research and development model (Research & Development). According to Sugiyono (2018), the Research and Development method is a method used to produce certain products and test the effectiveness of these products. This study aims to develop an android-based calistung application game as an interesting and interactive learning medium for students at the IT Cahaya Bunda Kindergarten in Ketapang. The model used is the ADDIE development model (Analyze, Design, Develop, Implementation, and Evaluation).



Figure 1. ADDIE Chart (Branch, 2009:2)

- a. Analyze  
Analyze stage. At this stage, it is done by exploring the problems that exist in schools that are a priority so that this educational game will be able to help alleviate these problems. At this stage, observations were made to the school as a place of research. In addition to interviews with teachers to dig up information related to problems in the classroom. The information that was extracted between the subjects was what were the obstacles and whether the existence of educational game media could help alleviate the problem
- b. Design  
Design Stage. At this stage, the formulation of materials and content that will become the main ingredients in educational games, the formulation of levels in the game and the content at each level is carried out. At this stage, a storyboard is created that contains navigation buttons between pages. From this design, an interface design is then made including background, navigation buttons, material image assets, layouts and so on. In making the design and content of the material, it should be carried out in coordination with the class teacher so that if there are deficiencies, they can be immediately corrected so that they do not work twice.
- c. Development  
The implementation in this process is the provision of program code from various designs that have been made. In making program code, it can be formulated into several functions including navigation between pages, game interaction functions, scoring functions, leveling functions, feedback functions,

voice functions and several other functions. After all these functions are created, they are entered into several pages as needed. After the process is complete, the application will be tested by itself first until everything goes according to plan. This is so that the work is more effective and when it is considered to media experts and material experts, there will not be many revisions that must be corrected. The results of suggestions for improvement from media and material experts will be accommodated and will be the improvement of this educational game. Implementation Phase. At this stage it is carried out by showing the final results of improvements from media experts and material experts. After this educational game is deemed feasible, it will then be distributed to the guardians of the students to be run by the students. At this stage will also get feedback from the teacher which will then be corrected at the evaluation stage. This response can be in the form of notes or even the results of the assessment of the test results before and after running this educational game. Implementation

d. Data analysis

In research and development of learning media for this android-based calistung application, descriptive analysis techniques are used to analyze data by describing or describing the data that has been collected from the results of development, validator responses, and responses from learning practitioners to obtain the practicality of learning media for android-based calistung applications. This type of data analysis is described in more detail to answer each research question about practicality which is stated through the instrument items given to validators and learning practitioners.

Research data collection was done by means of walkthroughs, questionnaires and learning documentation. The walkthrough technique is a data validation that involves several experts to evaluate the product as a basis for revising the initial product. The data collection tool used is in the form of a validation sheet given to the expert. Validation sheet given to the expert in the form of a Likert scale.

Validity Analysis. The data collected from this study is the result of validation of educational games based on android applications. The validity test in this study is useful to determine the validity of the instrument to be used. The type of validity used in this research instrument is the content validity of Aiken's v. Content validity means the authenticity of a test in terms of the content of the test. Validity analysis using Aiken V Validation using the formula:

$$V = \frac{\sum S}{n(c - 1)}$$

Description :

V = index of agreement rater (validator) regarding item validation

S = score assigned by each rater (validator) minus the lowest score used

N = number of raters (validators)

C = the number of categories that can be selected by the rater (validator)

Practical Analysis Phase. At this stage the questionnaire is given an assessment to the teacher where the research is located and will be measured using a percentage. The analysis of the practicality of learning media for the android-based calistung application is supported by data analysis from 2 practical components, namely (1) teacher responses; and (2) the observation sheet for the implementation of the learning process. Therefore, the data analysis activities for the two components are as follows: Observation sheets that have been filled in are then analyzed to obtain practical data from learning media using descriptive analysis techniques. Observational data will be analyzed descriptively by percentage using the following formula. The formula for this measurement is as follows.

$$R = \frac{\sum_{i=1}^n V_i}{n}$$

Description :

R = the average of the assessment results from the validator

V<sub>i</sub> = score of the i-th validator assessment results

n = many validators



According to Rakimahwati (2020). The existence of technology is very useful in supporting the learning process and for the development of children it has a positive impact, but currently, when compared to games in circulation, games with the theme of education for school learners are still very few. Early childhood will be happier when learning with game media.

### 3. Result and Discussion

Research and development of learning media in the form of Android-Based Educational Games to improve reading, arithmetic and writing skills using the Research and Development or (R&D) method which was developed using the ADDIE design which consists of 5 stages, namely: Analyze, Design, Development, Implementation, and Evaluation.

#### 3.1 Media Expert Validation Results

Media expert validation aims to test the presentation of the 'calistung' application as a learning media for android-based educational games to obtain information, input, feedback and suggestions related to the product being developed. The results of the validation are carried out in only one stage, the following is a table of results from media validation by experts.

Table 1. Media Validation Results

Indicator	$V_{media}$	Criteria
Appearance	3,89	Very Valid
Navigation	3,86	Very Valid
Convenience	3,89	Very Valid
$\Sigma$	11,64	Very Valid
$V_{media}$	3,88	Very Valid

Based on table 4. the results of the validation analysis of the learning media application 'calistung' as a learning media for android-based educational games for the display component are obtained using the aiken V index, namely  $V = 3.89$  which based on the index range is in the very valid category. For media navigation coverage, the average value obtained using the Aiken V index is  $V = 3.86$  which based on the index range is in the very valid category and for the ease of use, the average value is  $V = 3.89$  which based on the index range falls into the category very valid.

Based on the table above, the results of the validation analysis of learning media for educational games based on Android are obtained for aspects of indicators, display, navigation and ease of getting the average results obtained by validation analysis using the Aiken V index for presentation techniques starting from the statement of the first item, namely obtaining  $V = 3.88$  which is included in the very valid category. From the results of the assessment of material experts on the learning aspect, it can be concluded that the Android-based educational game learning media developed has a "Good" assessment. Apart from being in the form of a table, the results of the validation by media experts are also presented in graphic form to see the media expert's assessment as follows:

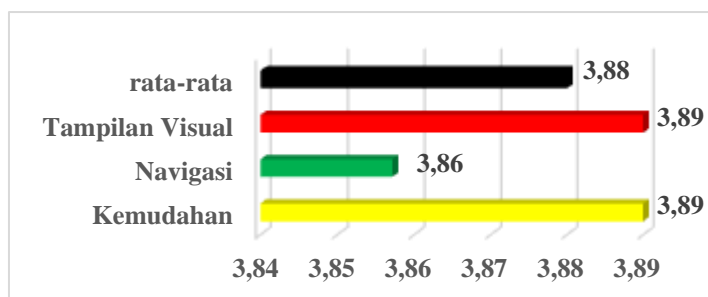


Figure 1. Keypoint Descriptor *Songket* Motif Beautiful Sweet

Figure 1. Diagram of the evaluation of media validation results In addition to these data, there are several suggestions for media improvement in terms of media display. Based on the assessment of the media expert, the product deserves to be tested with revisions according to the suggestions, other inputs that can be used as a basis for improving the product being developed.

### 3.2 Material Expert Validation Results

The next validation is material validation to see the feasibility of the material contained in the product so that later the product is suitable for use in the learning process. The purpose of this validation is to obtain information, input, feedback and suggestions related to the product being developed. The results of the validation are carried out in only one stage, the following is a table of results from the validation of the material by the validator as follows:

TABLE 2.  
MATERIAL EXPERT VALIDATION RESULTS

Indicator	$V_{Theory}$	Criteria
content quality	3,78	Very Valid
Appearance	3,86	Very Valid
language	3,89	Very Valid
$\Sigma$	11,53	Very Valid
$V_{Theory}$	3,84	Very Valid

Based on table 5. the results of the validation analysis of learning materials are obtained. The 'calistung' application as a learning media for android-based educational games for the content feasibility component is obtained by using the Aiken V index, namely  $V=3.78$  which based on the index range is in the very valid category. . For the coverage of the media display, the average value obtained using the Aiken V index is  $V = 3.86$  which based on the index range is in the very valid category and for the linguistic aspect, the average value is  $V = 3.89$  which based on the index range falls into the category very valid. Based on the explanation for each aspect above, the average value for all aspects is  $V = 3.84$  so it can be concluded that the learning media developed has been very valid. Apart from being in the form of a table of material validation results, data is also presented in graphical form to see the results of the material expert's assessment as follows:

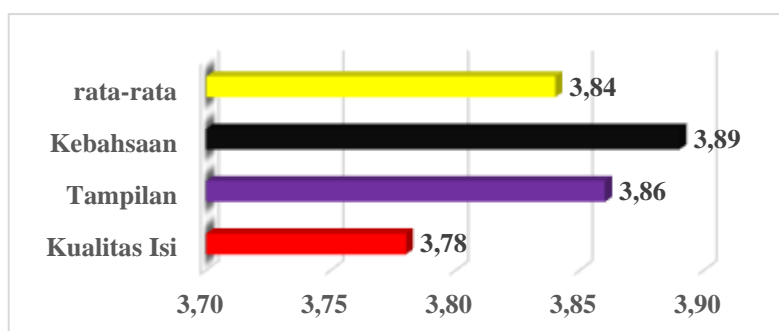


Figure 2. Diagram of the results of the material expert's assessment

From the results of the material expert's assessment on the aspects of appearance, language and quality of content, it can be concluded that the 'calistung' application as a learning media for Android-based educational games developed has a "Very Good" rating. In addition to these data, there are several suggestions for improving the media from the material side. Based on the assessment of the material expert, the product is feasible to be tested with revisions according to suggestions and other inputs that can be used as a basis for improvement of the developed product.

### 3.3 Learning Practitioner Validation Results

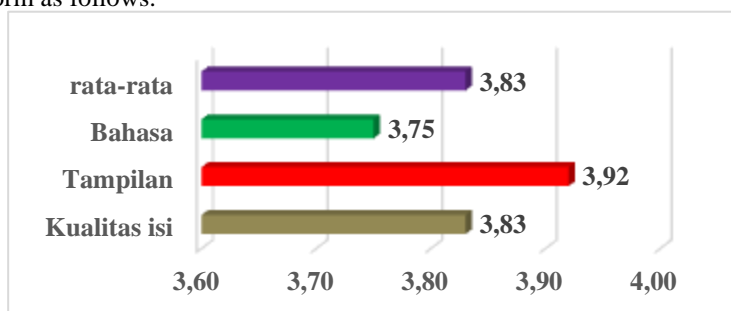
After being validated by media experts and material experts, the 'calistung' application as a learning media for Android-based educational games is then assessed by PAUD IT Cahaya Bunda teachers. Based on the results of the analysis with the results obtained by each expert practitioner, it can be seen in the following table:

**TABLE 1**

INDICATOR	V_(LEARNING PRACTITIONER)	CRITERIA
Indicator	V <sub>learning practitioner</sub>	Criteria
content quality	3,83	Very practical
Appearance	3,92	Very practical
Language	3,75	Very practical
$\Sigma$	11,50	
V <sub>learning practitioner</sub>	3,83	Very practical

Based on the results of expert validation from Learning Practitioners, it was obtained that in the aspect of content quality an average of 3.83 was obtained with very practical criteria, in the display aspect, an average of 3.92 was obtained with very practical criteria, the language aspect of the media obtained an average of 3, 75 with very practical criteria.

The table above shows that the assessment of learning practitioners (teachers) as respondents responded to the 'calistung' application as a learning media for android-based educational games with an average value range of 3.83 Hospital with very practical criteria. This value is in the range of the very positive category. this means that the 'calistung' application as a learning media for android-based educational games developed by researchers has very interesting criteria to be used as a tool in teaching and learning activities on Calistung material. In addition to being in the form of a table, the results of the validation of learning practitioners are also presented in graphical form as follows:



**Figure 2** Diagram of the results of the expert assessment of learning practitioners

According to Krisnawan (2015), games are systems that contain rules that limit player behavior and determine games made by presenting conflicts and interactions that contain artificial intelligence. In the game can contain educational value that may not be realized by the players.

### 4. Conclusion

The results of this study resulted in an Android-based educational game. This game was developed using the ADDIE method which goes through a process of analysis, design, development, implementation, and evaluation. In the feasibility test, this game gets an average validity value of 3.88, an average practicality value of 3.84 and an average practicality value of 3.83. So it can be said that this android-based educational game calistung application is very feasible to be distributed to PAUD IT Cahaya Bunda Ketapang students.

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