

Development of Luwu Culture Through Interactive Educational Games Based on Android Smartphones by Using Abode Animate CC

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ABSTRACT

The objective of this study is to create educational game applications using Adobe Animate CC and assess the effectiveness and feasibility of interactive educational games on Android smartphones. This research falls under the Research and Development (R&D) category using the Multimedia Development Life Cycle (MLDC) model. The research was carried out on the student population of the Madrasah Ibtidayah Teacher Education study programme at IAIN Palopo for the academic year 2021/2022, which consisted of 87 students. Meanwhile, the trial involved second-semester students who programmed social studies courses Madrasah Ibtidayah/Elementary School, namely a group of 15 students. The data collection methods employed in this study encompassed interviews, observation of validity questionnaires, and practicality questionnaires. The application development process employs the MDLC development paradigm, which encompasses six stages: concept, design, material collection, assembly, testing, and distribution. This study reveals that the utilisation of this application has the potential to enhance students' understanding, particularly in regard to the fundamental aspects of Palopo's culture, as demonstrated by the use of this game. The gaming application was evaluated by experts, who determined that the product's value, as assessed by material specialists, was 94%, indicating that it is suitable for distribution. Media specialists generate a 90% score (very commendable for dissemination). Conversely, the practicality test yielded a 90% (efficient) final score. The practicality test results of 92% indicate a high level of efficiency and are suitable for dissemination.

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1. INTRODUCTION

Indonesia exhibits a multitude of civilizations spanning from Sabang to Merauke, with a wide array of languages, customs, and attire. The presence of these diversities makes Indonesia the country with the highest level of diversity in the world. Hence, it requires a deep affection for its own culture. It is imperative to expose children to culture at an early age, such as by instructing them in the native language

and acquainting them with local products. The Luwu tribe possesses certain characteristics that differentiate it from other ethnic groups. These differences are evident in their cultural work called "sure' La Galigo," where each individual's name serves as a distinct identity that reflects their essence. For instance, in the case of Empress La Patigana, her name "We Lette Sompaa" signifies the worship of lightning (Abidin 2016). The ethnicity is known as Luwu and is derived from the Luwu language and culture.

On one of the online media pages published on March 7, 2019, it was stated that Indonesian cultural values were starting to fade. This was due to a lack of awareness of the high cultural values of love for the country's patriotism (Subaryana 2012). Society has been influenced by foreign cultures, which is more developed than the Western world. With a trend circulating in society, it will cause children, teenagers, and even adults, to follow it without considering the pros and cons of the trend in circulation (Hartanti 2019; Mardhotillah and Rakimahwati 2021).

Technological developments are very rapidly affecting all sectors of human life. Sophisticated technology was created to facilitate human work in this modern era. Humans are very dependent on technology. Smartphones (Gawai) are one of humans' most needed technological products. It can be seen from the 2019 data that around 170.6 million people out of a total of 269.6 million Indonesians already use smartphones. This means that around 63.3% of Indonesia's population uses mobile phones as a primary device (Jamilah 2020). Based on these data, the world of education also uses gadgets as learning media.

Interactive media is classified as constructivist media due to its inclusion of the essential components of learning, including the educational content, students, and the learning process. Heinrich defines interactive media as a compilation of educational resources organised in a single discourse, encompassing various forms of media such as slides, videotapes, pictures, short films, maps, worksheets, recordings, graphs, charts, brochures, natural objects, and models (Tarigan and Siagian 2015). Ramadhani (2013) defines interactive media as the incorporation of digital media into a well-organized digital setting that facilitates interactions between users and the content or information inside the media (Arindiono and Ramadhani 2013).

Educational games are composed of the two words "game" and "education" when seen through the lens of the word elements. A game is an organised form of play that has multiple purposes, including the development of motor nerves and spatial abilities, as well as the provision of amusement and emotional support. Learning one's own identity requires constant observation and study (Fithri and Setiawan 2017). One kind of media that can boost user understanding through engaging media is educational games. Dear Veronica, One definition of an educational game is "an instructional tool that combines the purpose of learning with the enjoyment of playing" (Veronica 2018). According to Haris Febriyanto Ramadhan and Sampe Hotlan Sitorus (2019), educational games are a method of learning that involves engaging in enjoyable activities in order to bring about changes that indicate a high level of self-quality. Furthermore, since the learning activities are integrated into the gameplay, educational games can pique children's attention and encourage them to participate.

The Bodo shirt is a loose, short-sleeved shirt with relatively thin, square-shaped fabric with armholes on both sides, and the Tutu' shirt is a long-sleeved button-up shirt. If the two shirts pair, they will be the same color. Each color on the shirt has a different meaning, bright red for children and youth, green for nobles, purple for widows, dark red for married people, white for the host, and black for aged people (Bahfiarti 2016). Bodo and Tutu clothes are usually equipped with a traditional Bugis cloth subordinate Lipa' Sabbe and several supporting accessories such as headbands, necklaces, bracelets, badik, and headbands (Hamid 2022; Rusdi 2022).

The Luwu regional song is a pattern in the form of music and lyrics which are patterned so that the rhythm is beautiful. Regional songs have absorbed regional elements, both in terms of the lyrics and the regional musical instruments used, and then developed and became a culture of certain ethnicities and tribes (Mustajab 2013). Several examples of Luwu folk songs are quite famous and often heard in Luwu society, such as Lembata Tana Luwu, Pande' Tongan tu Nene' ta, and Bunga-Bunganna Masamba. These songs are examples of complex local wisdom, such as in terms of the messages contained in the lyrics, the

language used, to the use of regional musical instruments in the songs. The song entitled "Lembata Tana Luwu" was chosen by the author as a back sound in learning media because of the meaning of introducing the Luwu area in the lyrics.

2. METHODS

This research uses the type of research called R&D (Research and Development) or development research. Sugiono said development research is research that will produce a specific product. (Haryati 2012). The development design used in this study is the MDLC (Multimedia Development Life Cycle) development design, which is a model for developing multimedia learning media that is very suitable for developing learning media in the form of game applications that the author will develop. This development design consists of 6 stages: concept, design, material collecting, assembly, testing, and distribution.

The six stages form a single unit of a rotating wheel so that other researchers can continuously update the resulting development products. This concept is very suitable for developing technology-based learning media, such as game applications because technology will continue to spin and be developed.

The population in this study were 87 students of the Madrasah Ibtidayah Teacher Education study program. Meanwhile, 15 students were the subjects of the trial in semester II who were programming the MI/SD IPS course. This research was conducted for 7 months, from January to July 2022. This research focuses on developing interactive educational game media based on Android smartphones.

The instruments used in this study were observation sheet testing and validation questionnaires. Validation questionnaires were given to 2 people consisting of 1 material expert and 1 media and design expert. Material expert validation indicators include:

Table 1. Material Expert Validation Indicator

No	Aspect	Indicator	Question Item
1.	Learning Design	Purpose	1,2
		Flexibility	3
		Compatibility of the material with the game	4
		Grammar	5
2.	Theory	Content Material	6,7
		Material Wrinkling	8
		Implementation of materials and games	9
		Material Completeness	10
3.	Benefit	Overcome tool limitations	11
		Benefits for lecturers	12
		Benefits for students	13

The data collection technique used in this study is the form of interviews to obtain data about Luwu culture in Luwu land. Observation Sheet for Product Testing interactive educational game media products. The validity questionnaire in the form of a developed questionnaire was collected from the validity of media, design experts, and material experts. The Practicality Questionnaire is developed and collected by students who are programming the MI/SD IPS course.

The data analysis technique used in this study was data analysis of the results of this study in the form of data analysis on the results of product feasibility assessments and the practicality of introducing Luwu culture through interactive educational media games based on android smartphones analyzed descriptively.

The feasibility level of the resulting product is measured using a questionnaire instrument by taking into account suggestions and criticisms from the validator. In the questionnaire used, 4 scores/rating scales have meanings:

Score 1: not feasible

Score 2: quite decent

Score 3: decent

Score 4: very decent

Next, determine the final score, which is a benchmark for the eligibility of the product produced by calculating the average score/percentage of eligibility with the following formula: (I Made Dwika Handikha, Anak Agung Gede Agung 2013)

$$\text{Persentase} = \frac{F}{N} \times 100\%$$

Explanation:

F = The total number of results (\sum [answers x weight of each choice])

N = Total number (number of statements/questions x highest weight)

The answers obtained based on the formula are then interpreted to become qualitative data based on the following table:

Table. 2 Interpretation of Product Validity/Practicality Levels (Andromeda 2020)

Achievement Level (%)	Qualification
80 – 100	Very Valid/Very Practical
60 – 80	Valid/Practical
40 – 60	Valid Enough/Practical Enough
20 – 40	Less Valid / Less Practical
0 – 20	Invalid/Not Practical

This section describes how the research was conducted. The primary materials of this section are (1) research design; (2) population and sample (research objectives); (3) data collection techniques and instrument development; (4) and data analysis techniques. For research that uses tools and materials, it is necessary to write down the specifications of the tools and materials. Tool specifications describe the tools' sophistication, while material specifications describe the types of materials used.

3. FINDINGS AND DISCUSSION

3.1 Concept

At the concept stage, the authors formulate the problems found in the field and then unite and solve them by pouring them into the application being developed. Mustika, Eka, and Maissy divided the concept stage into 3 analyses (Mustika, Eka Prasetya Adhy Sugara 2018) that are:

3.1.1 Analysis of objectives, namely the determining or the benefits of learning media

Based on the results of interviews with students, it was stated that the material at CPL is the ethnic and cultural diversity of the Indonesian nation, which describes ethnic material in Indonesia and the results of its purchases which tend to be long, sometimes making students feel bored and difficult to understand, this is evidenced with 9 out of 15 students answering bored and difficult when interviewed, it is necessary to develop learning media that attracts students' attention. This is also in line with the interviews conducted with the lecturers of the Social Sciences course, who said, "the hope is that students can understand and be understood and students can be independent and can learn the material on their own."

In addition, based on the results of interviews with the lecturers of the Social Sciences course, who stated that the use of technology-based learning media had not reached its maximum and the lecturers only provided distance learning from videos shared via WhatsApp group conversations

(during the pandemic). However, on average, campus residents already have an Android smartphone but have never used it as a learning medium, especially learning media in the form of game applications. So, the analysis of the objectives obtained is how to use an Android Smartphone as a technology-based learning medium and how to make the material contained in it not seem long and tedious. This is in line with the answers to interviews by the lecturers of the Social Sciences course, who said, "I hope students can quickly understand the material, be independent in learning, and get to know Luwu culture better."

3.1.2 User analysis, namely determining who will use learning media

Based on the results of interviews with the lecturers of the Social Sciences course, it is hoped that there will be technology-based learning media that can be used independently by all students and can reach student purchasing power or can be owned by all students. Therefore, the author decided to distribute the product through the PlayStore app market so that all students and non-students can have it quickly and for free. This is the same as the lecturer's answer for the Social Sciences course: all students respond when learning. However, exciting learning media are still needed and must be easily accessible.

3.1.3 Concept analysis, namely the description of the learning media that will be built

Various answers were obtained based on interviews with 15 students regarding the educational game learning media they wanted/liked. That is, 3 students answered blue and green, 2 students answered they had a quiz, 3 students had pictures, 1 student answered they had a story, 2 students answered they had a video, 2 students answered the same game they played, and 2 students answered the fun one played. Therefore, the author combines all of these answers into the concept of learning media that will be built.

Based on this needs analysis, it can be seen that there is a need to develop learning media based on Android Smartphones that can be quickly and inexpensively reached by students. The application is tailored to the interests and interests of students taken from the completion of student answers.

3.2 Design

The design stage is the stage of realizing what has been found in the concept stage. The author provides solutions to problems or user needs by creating an appropriate design and pouring it into a flowchart to make designing and organizing content easier. The complete flowchart that has been compiled can be seen as follows:

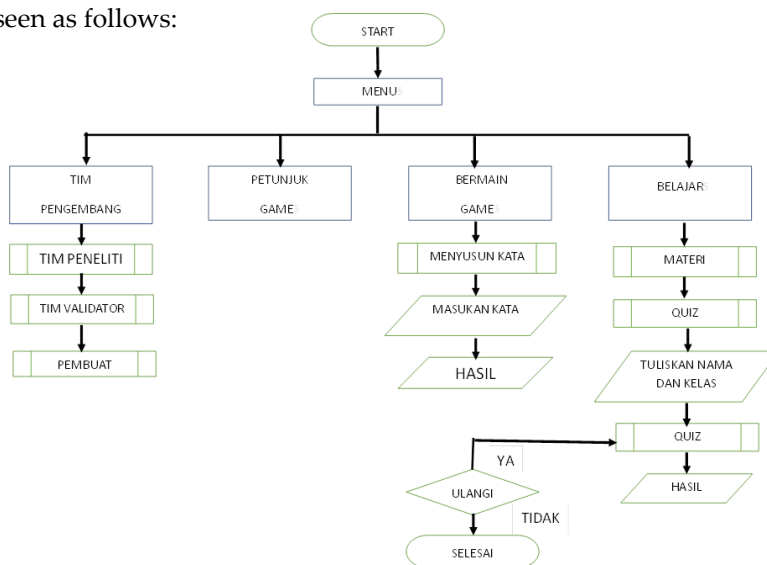


Figure 1. Flowchart

Based on the flowchart, it can be translated into mind mapping as an initial design plan including the following:

3.2.1 Main Menu

The screen's main menu page will display animated screens of two characters, namely the male traditional dress character (left side) and the female traditional dress character (right side). In addition, the game title placed in the top center is a spotlight so that when users run games their main attention is on the title. Do not forget that the author also includes exit/exit buttons at the top right and top left of the screen.

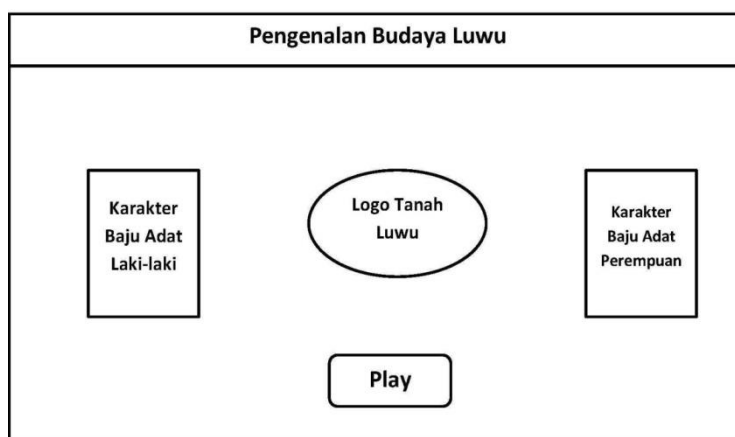


Figure 2. Main Menu Design Page

3.2.2 Options Menu

The options menu is the page that appears when the user presses the start button on the main menu. The options menu contains four advanced menus: the developer team menu, which contains the research team, the validator team, and the game makers. Both game guide menus contain game rules. Before entering the games menu, you first enter the study menu to read the material and answer quizzes. The three study menus contain 9 Luwu cultural materials, a quiz containing 10 multiple choice questions, and the games menu containing two games. In addition, on the right and left in the upper corners of the screen are the logo of the Ministry of Religion (on the left) and the logo of the Palopo State Islamic Institute (on the right). This option menu is also equipped with a return menu (to return to the main menu) at the bottom right of the screen.

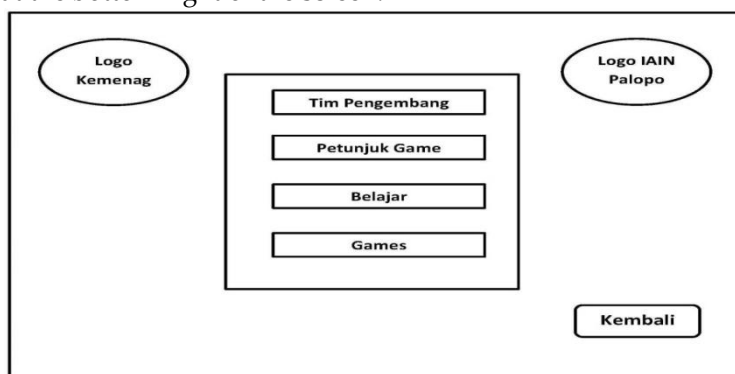


Figure 3. Design Options Menu Page Design

3.2.3 Development Team

The developer team menu contains the research team, validator team, and game creators: the research team, namely Lilis Suryani S.Pd. M.Pd., Ahmiranti, and Sukmawaty, S.Pd., M.Pd., the validator team consisted of 2 people, namely Andi Nila Ferawaty (material expert) and Fadhillah Hazriana ST. Meng (media and design expert), and game makers, namely Deni Suhendra, S.Pd and Mifta Zulfahmi Muassar S.Pd, M.Pd.



Figure 4. Design of the Developer Team's Menu Page Design

3.2.4 Game Hint

Game instructions are procedures before entering the game menu. Students first enter the study menu. On the learning menu, there are materials and quizzes.



Figure 5. The Design of the Games Manual Menu Page

3.2.5 Learn

The learning menu is the core menu in the Luwu culture introduction educational game. There are two menu options in the learning menu: the material menu and questions.

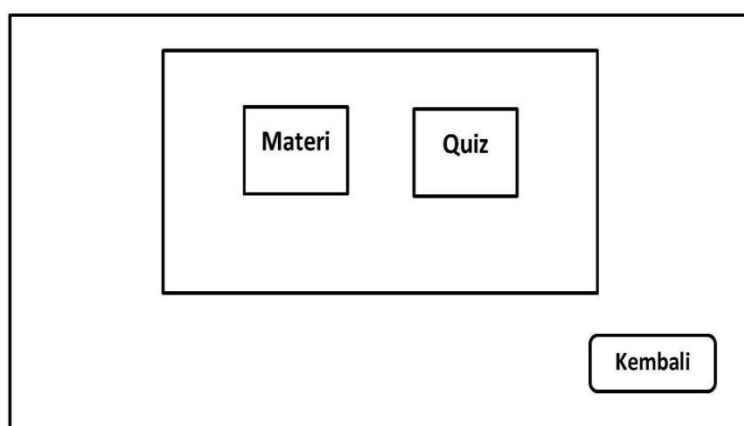


Figure 6. Study Menu Page Design (1)

This menu material is taken from CPL, ethnic and cultural diversity in Indonesia, which is integrated into the local wisdom of the Land of Luwu, where the material menu contains 9 Luwu cultural materials, including an introduction to traditional houses, traditional dances, traditional

clothes, regional songs, special foods, traditional ceremonies, traditional weapons, and musical instruments.

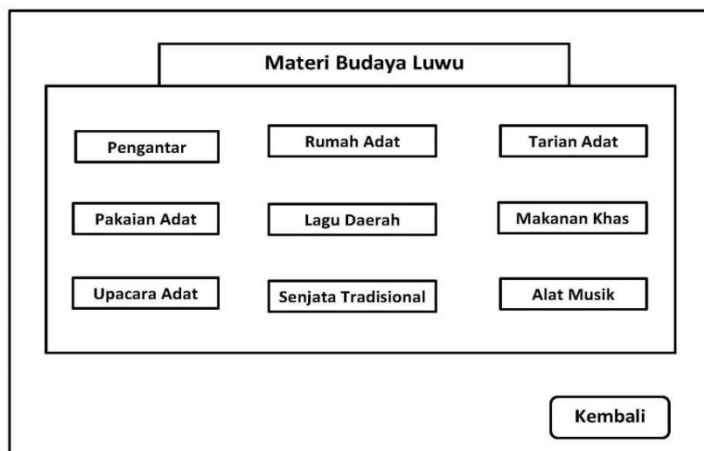


Figure 7. Study Menu Page Design (2)

The quiz consists of 10 multiple-choice questions that are directly relevant to the topic. Each correct answer is worth 10 points. The questions are available on the material menu for students to practise and test their understanding independently.

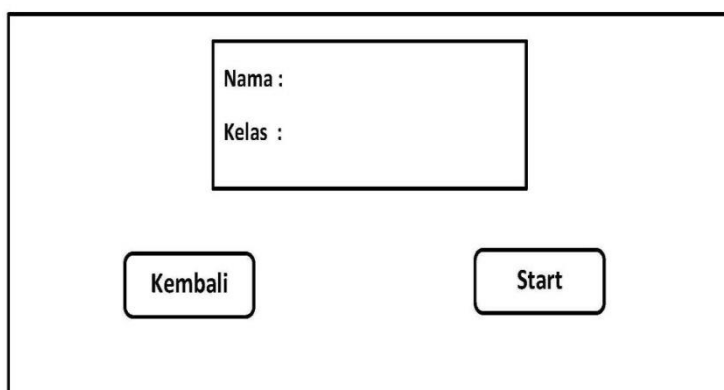


Figure 8. Study Menu Page Design (3)

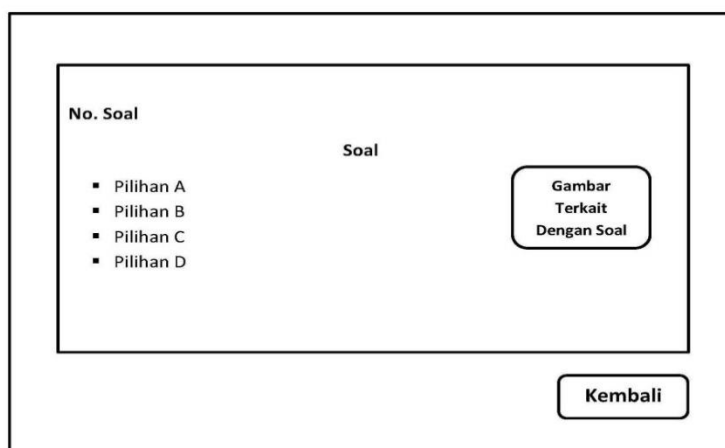


Figure 9. Study Menu Page Design (4)

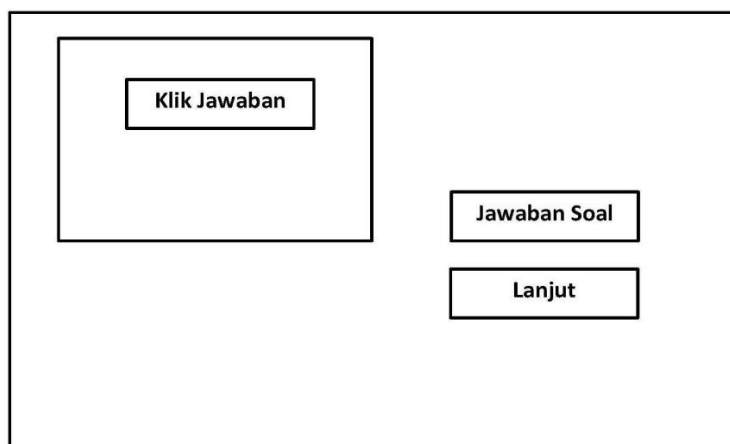


Figure 10. Study Menu Page Design (5)

3.3 Game

The game menu is the core menu in the Luwu culture introduction game. In the play menu, 2 simple games are equipped with Tara and Tenri as characters.

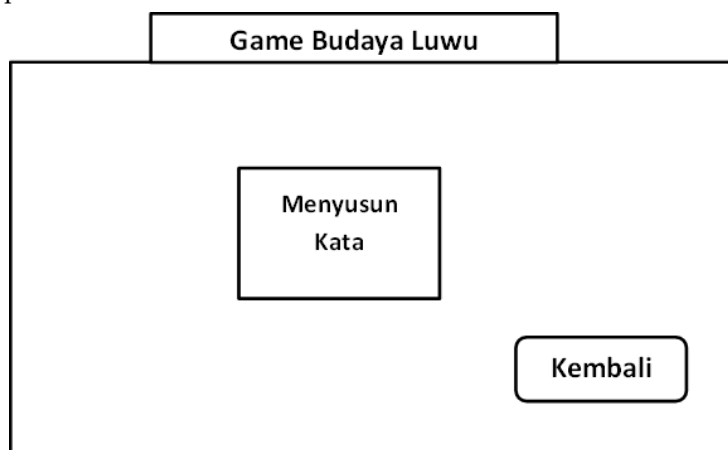


Figure 11. Design of The Games Menu Page

This game is named arrange words. This game aims to arrange words with the pictures provided, and then at the bottom, there is a box to enter letters so that they become one word. The process of designing the required images uses application assistance/tools. The applications used by the author are Adobe Animate, Adobe Flash, and Action Script 3. The steps for making a game are as follows:



Figure 12. Display of Adobe Animate CC



Figure 13. Display of the Adobe Animate Interface



Figure 14. Making Application Buttons

3.4 Blackbox testing results

The results of tests conducted by the author can be seen in the following table:

Table 5. Table of Blackbox Testing Results

Parameter	Result	Explanation
Compatibility	It can be used on various types of hardware	The test is performed on the device Redmi Note 8 (RAM 4 GB), Realme 5 (RAM 4 GB), Samsung Galaxy J2 Prime (RAM 1,5 GB), dan Samsung Galaxy J3 (RAM 1,5 GB)
Sensitivity/according to command	Works fine	-
Navigator key	Works fine	-
Sounds and sound effects	Works fine	-

3.4.1 Expert Validation Results

After making sure the application is functioning smoothly and correctly, the application is ready to be given to 2 experts for further testing. The results of product testing from the two experts are:

1) Material Expert

Validation of material experts was carried out by filling out a questionnaire with 4 rating scales, namely Strongly Agree (SS), Agree (S), Less Agree (KS), and Disagree (TS). In addition, the author also

provides notes and suggestions columns to enable expert lecturers to provide explicit written criticism and suggestions. The material expert assessment questionnaire contains 3 aspects and 11 assessment indicators in line with the realm of assessment in terms of material. The material expert provides brief notes on several aspects of the assessment: The presentation of the material is written in a short but clear and easy-to-understand way, especially in the use of regional languages in tana Luwu. The results of the assessment percentage from material experts get a score of 94% with very valid product qualifications. This means cultural introduction media products can be distributed or continued at the next stage.

2) Media and Design Expert

The media and design expert assessment questionnaire contains 3 aspects and 14 indicators with 23 statements in media and design that must be assessed. At this stage, media and design experts suggest an improvement: In the future, if the application is developed using more modern software, for example, MIT Inventor. From the results of the questionnaire testing obtained from media experts and learning design applications introducing Luwu culture through interactive educational games developed by the authors, a feasibility percentage value of 90% is included in the very valid product qualifications. That is, from the point of view of media experts and the design of the resulting learning media products can be used.

3.4.2 Practicality Test

The practicality test was then carried out after the product was declared feasible by the three experts who had assessed it. The result that of all students who conducted a practicality test on fifteen respondents, one respondent got results in the practical category, and fourteen respondents got results in the efficient category. The total number obtained a score of 1184 out of a total maximum score of 1320 and a result of 90%, which is included in the practical category. The results indicate that the resulting product is feasible/fit for use and dissemination. Meanwhile, the results of the questionnaire containing 7 aspects and 14 indicators with a total of 22 statements obtained a feasibility percentage value of 92% which is included in very valid product qualifications. That is, aspects and indicators of the resulting learning media can be used.

Distribution

Distribution is the product dissemination stage assessed in the previous stage and received a proper category. The product of introducing Luwu culture through an interactive game based on an android smartphone is still being distributed within the IAIN Palopo campus, especially in the Madrasah Ibtidaiyah Teacher Education study program, Faculty of Tarbiyah and Teacher Training IAIN Palopo. The application is stored on Google Drive, and students can download it via the link <https://bit.ly/BudayaLuwuApk>.

Discussion

The Process of Developing an Introduction to Luwu Culture Through the Media of Interactive Educational Games Based on Android Smartphones

The application for introducing Luwu culture through an interactive educational game based on an Android smartphone was developed using the R&D (Research & Development) research method and the MDLC (Multimedia Development Life Cycle) development model by Luther Sutopo. The MDLC development model consists of 6 steps, namely concept, which includes requirements analysis, design, material collecting, assembly, testing, and distribution. The MDLC development model is used because it aligns with the learning media being developed, namely multimedia. In addition, the flow in the MDLC model is in the form of rotation in line with the nature of information technology which is constantly being updated.

The first step taken in application development is Concept/requirements analysis. Concept/needs analysis is divided into 3: objective analysis, user analysis, and concept analysis. The three results of the analysis are translated, and conclusions are drawn so that they can become the initial

concept of the product to be made. Analysis of the objectives obtained is to create learning media that can make students understand the material. The objective analysis contains the determination or benefits of the product, namely developing learning media in the form of an Android smartphone-based game application that aims to attract students' attention, provide new experiences in using technology-based learning media, and make students understand the material contained therein.

Finally, the concept analysis contains a description of the product to be developed, such as the material loaded, the type of game loaded, the menus and submenus in it, the appearance, and so on that are contained in the product being made. The analysis of the concept of learning media that will be built will contain material "tribal and cultural diversity of the Indonesian people," which integrates Luwu culture realized in the form of game applications whose type of appearance is finalized from the results of the needs analysis. Like, colorful and has quizzes, pictures, storylines, videos, the same games they play, and fun games to play. The results of the analysis are in line with research (Astatin and Nurcahyo 2016) that learning media can influence the success of the competencies. This is reinforced by Akmaliah that game applications are entertaining media that attract attention. The concept display that will be used meets the requirements of multimedia learning media (Wuryandari and Akmaliah 2016). Among them are colorful, exciting characters and sounds that can please the heart (I Made Dwika Handikha, Anak Agung Gede Agung 2013).

The material collecting stage is the advanced stage of the design stage. Material collecting is finding and collecting materials from various sources that the author cannot design to complete development needs. Some of the elements collected by the author at the material collecting stage are accompaniment music, sound effects, font types, images/backgrounds, and tools/assistant applications. After the things needed have been collected using design and material collecting. Next is releasing or merging these elements into a complete application. At this stage, the author uses Adobe Animate, Adobe Flash, and Action Script 3 applications.

The validity of introducing Luwu culture through interactive educational games media based on Android smartphones

After successfully making an application that can be used, the testing stage will be carried out as a product evaluation stage that is made whether it is feasible to proceed to the next stage, namely distribution. This stage is carried out by 2 validators, namely, 1 expert in the media and design field and 1 expert in learning materials.

Material experts contain 3 aspects of assessment with a scale of 1-4. The final percentage of product value obtained from the material expert is 94% with the category of proper distribution. Media and design experts contain 3 aspects with the same scale and produce a percentage value of 90%, which is also included in the category suitable for distribution. If the two percentage values from the results of the product assessment are averaged, it will produce a final percentage value of 92%. These results are in line with the interpretation table written by I Made Dwika Handikha (2013). A product is categorized as proper/good if it obtains a percentage of 80-89%.

The final step of the MDLC development model series is distribution, which is the stage of product dissemination to users. This stage is still distributed within the scope of the IAIN Palopo campus, especially in the Madrasah Ibtidaiyah Teacher Education study program, Faculty of Tarbiyah, and Teacher Training IAIN Palopo. These six steps succeeded in developing a product with 3 menu options as the main menu in the application. The first menu is the development team which contains the research team, validator team, and game makers. The second menu instructions for using the game. The third menu, playing games, contains 2 simple mini-games called composing words and matching pictures. The fourth menu, learning, contains 8 Luwu cultural materials and 10 multiple-choice questions.

Practical product introduction to Luwu culture through interactive educational media games based on Android smartphones

Fifteen students conducted the results of the practicality test as respondents: one respondent obtained results in the practical category, and fourteen respondents obtained results in the convenient category. The percentage of the final score obtained from the results of the practicality test based on students is 90% which is in the convenient category. While the percentage of the final score obtained from the practicality test results based on 7 aspects and 14 indicators is 92% which is in the convenient category. Based on the results of the testing carried out by experts and the results of the practicality test, it can be concluded that the Luwu culture introduction application product through interactive educational game media based on an Android smartphone that has been developed has received a very appropriate category and can be widely disseminated.

4. CONCLUSION

The application development process uses the MDLC (Multimedia Development Life Cycle) development model, which consists of 6 stages: concept, design, material collecting, assembly, testing, and distribution. The concept is the initial stage of data collection from the research location or needs analysis. Design is the stage of making elements that writers will use in development, such as plot/storyboard, characters, symbols, images, and narration or dubbing. Collecting material is the stage of searching and collecting the elements needed in the development process but cannot be made by the author, such as musical accompaniment, sound effects, font types, images/backgrounds, and application tools/auxiliaries. Assembly is the stage of combining and building applications into usable applications. Testing is the stage of evaluating the feasibility of the product so that it can be widely disseminated. Distribution is the dissemination stage with the help of the app market. These six stages produce a ready-to-use BERLARI game application product.

Feasibility was assessed by 2 experts, namely material experts, media experts, and design experts. The final percentage of product value obtained from material experts is 94%, with a very feasible distribution category. Media and design experts contain 3 aspects with the same scale and produce a percentage value of 90%, which is also included in the very feasible category for distribution. Fifteen student respondents conducted the practicality test obtained: one respondent obtained results in the practical category, and fourteen respondents obtained results in the efficient category. The percentage of the final score obtained from the results of the practicality test based on students was 90% who were in the efficient category. While the percentage of the final score obtained from the results of the practicality test based on 7 aspects and 14 indicators is 92% which is in the efficient category and can be disseminated.

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