

DEVELOPMENT OF DIGITAL MODULES IN THE CONTEXT OF BUGIS CULTURE TOWARDS STRENGTHENING CHARACTER EDUCATION AND IMPROVING NUMERACY LITERACY SKILLS

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Received July 29, 2024; Revised November 15, 2024; Accepted November 25, 2024

Abstract:

This study aims to determine procedures for developing digital modules in Bugis cultural context to strengthen character education and improve numeracy literacy skills that are feasible to use. The type of research used is research and development (R&D). The population of this study were fifth-grade students of SD Negeri 296 Lapaukke. The results of this study indicate that the Digital module developed using the ADDIE model through 5 stages, namely, analysis, design, development, implementation, and evaluation. Based on the results of the study, it was found that: (1) The Bugis cultural context digital module is feasible to use in improving students' numeracy literacy. This is evidenced by the calculation results of media experts by 95% (very valid) and material experts by 100% (very valid) obtained a percentage of 97.5% (very valid). The recapitulation results of the student response questionnaire are 100% (very practical). From the recapitulation of student tests, the average score is 78.4% (effective). (2) The development of Bugis cultural context digital modules on strengthening character education and improving students' numeracy literacy skills is very effective. This is evident from the numeracy literacy test results of 21 students who completed or 95% of the total number of students and there was only one student who did not complete or 5% of the total number of students. The conclusion is that the Bugis cultural context digital module is effective in strengthening character education and improving students' numeracy literacy skills.

Keywords: Digital Module, Bugis Culture, Character Education, Numeracy Literacy, Independent Curriculum

PENGEMBANGAN MODUL DIGITAL KONTEKS BUDAYA BUGIS TERHADAP PENGUATAN PENDIDIKAN KARAKTER DAN PENINGKATAN KEMAMPUAN LITERASI NUMERASI

Abstrak:

Penelitian ini bertujuan untuk mengetahui prosedur pengembangan modul digital konteks budaya Bugis terhadap penguatan Pendidikan karakter dan peningkatan kemampuan literasi numerasi yang layak digunakan. Jenis penelitian yang digunakan adalah penelitian dan pengembangan atau research and development (R&D).

Populasi penelitian ini adalah siswa kelas V SD Negeri 296 Lapaukke. Hasil penelitian ini menunjukkan bahwa modul Digital yang dikembangkan menggunakan model ADDIE melalui 5 tahapan yaitu, analisis, perancangan, pengembangan, implementasi, dan evaluasi. Berdasarkan hasil penelitian ditemukan bahwa: (1) Modul digital konteks budaya bugis layak digunakan dalam meningkatkan literasi numerasi siswa. Hal ini dibuktikan dari hasil kalkulasi ahli media sebesar 95% (sangat valid) dan ahli materi sebesar 100% (sangat valid) diperoleh persentase sebesar 97,5% (sangat valid). Hasil rekapitulasi angket respon siswa 100% (sangat praktis). Dari hasil rekapitulasi tes siswa mendapat nilai rata-rata 78,4% (efektif). (2) Pengembangan media etnomatika digital berbasis android terhadap kemampuan literasi numerasi sangat efektif. Hal ini terbukti dari hasil tes literasi numerasi 21 siswa yang tuntas atau 95% dari jumlah keseluruhan siswa dan hanya ada satu siswa yang tidak tuntas atau 5% dari jumlah keseluruhan siswa. Kesimpulannya adalah Modul Digital Konteks Budaya Bugis efektif terhadap penguatan Pendidikan karakter dan peningkatan kemampuan literasi numerasi siswa.

Kata Kunci: Modul Digital, Budaya Bugis, Pendidikan Karakter, Literasi Numerasi, Kurikulum Merdeka

How to Cite: Hardianto, & Makmur., A. (2024). Development of Digital Modules in The Context of Bugis Culture Towards Strengthening Character Education and Improving Numeracy Literacy Skills. *MaPan : Jurnal Matematika dan Pembelajaran*, 12(2), 219-234. <https://doi.org/10.24252/mapan.2024v12n2a2>.

INTRODUCTION

Mathematics is very important to be taught at primary to secondary school levels as a provision in solving all problems faced in society and the state, especially those related to calculations, numbers, and symbols. However, the reality that occurs in the field is that most students who hear the word mathematics immediately scream, indicating that they do not like mathematics subjects. Sophia and Wutsqa (in Afrianingrum & Rahayu, 2021) explain that mathematics not only wants to develop students' mathematical abilities but also participates in growing and developing affective aspects through the mathematics learning process.

Anisa (2014) further explained that the success of the mathematics learning process will produce students who can communicate, understand, and compete in solving various problems faced in everyday life. Thus, it can be concluded that mathematics has a vital role in society, including culture.

Mathematics is a science that is structured like stairs, meaning that the first material must be understood to understand the next material and so on (Hardianto, Baharuddin, & Safitri, 2024). Furthermore, Hardianto and Indah (2023) explained that in studying and understanding mathematics many things must be understood well, starting from procedural understanding to conceptual understanding. One of the six literacies that is very important, especially in mathematics lessons, is numeracy literacy.

Numeracy is generally defined as the ability to apply number concepts and calculation skills in everyday life. Wulandari (2021) stated that the skill that is needed in 21st-century education is numeracy literacy. Furthermore, Anderha and Maskar (2021) stated that numeracy literacy is closely related to student achievement. By having good numeracy skills, we always consider everything before starting work. Numeracy also leads us to everything that must be related to the mind. Numeracy literacy is more interesting when it is connected to the culture around students.

The values of character education, namely: religion, tolerance, creativity, discipline, hard work, democratic, curiosity, independence, national spirit, love for the country, honesty, respect for achievement, friendly/communicative, social care, peace-loving, fondness of reading, responsibility, and environmental care (Kusnoto, 2017). The values mentioned will be more meaningful if combined with the culture of the learners (Safitri, Zainal, Mendila, & Hardianto, 2023).

Culture is defined as everything related to the thoughts, customs, habits, works, and intellect in society from generation to generation. Culture is thoughts, customs, reasons, results, or something that has become a common habit and is therefore difficult to change (KBBI, 2016). Thus, it is clear that culture is closely related to education. This is in line with Azriani, Hasratuddin, and Mujib (2019) opinion that education makes a person cultured because education and culture are tied to one another. Culture is closely related to the field of science, one of which is the field of mathematics.

Bugis culture has so many advice or advice that is a guide in organizing life for generations ranging from children, adolescents, and adults to parents. The philosophies of Bugis culture (*Rebba Sipatokkong*, which means that if they fall, they uphold each other, *Mali Siparappe*, which means that if they drift, they lay each other down, and *Malilu Sipakainge*, which means that if they forget, they remind each other) are expressions that are full of meaning (Sudirman, Ramli, Iskandar, & Huzain, 2024). If the philosophies mentioned are actualized

in the educational environment, then cases that correlate with character (intolerance, bullying, and sexual violence) will no longer be a scourge and common fear. Apart from philosophy, there are also traditional buildings owned by the Bugis tribe.

The *Atakkae* and *Saoraja Lapinceng* traditional houses are two of the many cultural buildings owned by the Bugis tribe. The buildings have geometry-shaped parts, such as squares, rectangles, cubes, blocks, and so on. The building for the world of education should be used as a medium in the learning process, especially in mathematics. However, the fact is that students are less familiar with the philosophy that should be a guide in life and cultural buildings that should be a medium for learning fun math. Perhaps parents and the surrounding environment do not introduce it enough so it has an impact on children and adolescents who forget and do not even recognize their own philosophies and cultural buildings (Safitri, Zainal, Mendila, & Hardianto, 2023).

Education needs to be comprehensive and integrated so that intelligence and character are in harmony without forgetting culture. A person's intelligence and character are two things that cannot be separated because they are interconnected. Intelligence is not enough without character, and intelligence is not complete without character (Susilawati, Sarifudin, & Muslim, 2021). The urgent problems faced by the world of education today based on initial observations found at SDN 296 Lapaukke is: a) the unavailability of teaching modules that harmonize intelligence, character, and culture, b) culture is slowly forgotten, c) the latest PISA literacy numeracy results place Indonesia 70th out of 81 participating countries with a score of 379 (Kemendikbud, 2019), and d) the rise of various cases that correlate with character that are increasingly concerning, Nadiem Makarim as the ministry of education and culture calls it the three big sins of education (intolerance, bullying, and sexual violence) (Farida, Risqa, Rachmawati, Af'idah, Hidayah, Ni'mah, & Prasetyo, 2024).

Based on the description above, the researcher is interested in raising research that harmonizes intelligence, character, and culture to the improvement of students' numeracy literacy with the title "Development of Digital Modules in The Context of Bugis Culture Towards Strengthening Character Education And Improving Numeracy Literacy Skills".

METHODS

This type of research is R&D (research and development). Sugiyono (in Titiek, 2021) states that R&D (research and revelopment) or research and development is a research method that aims to produce or develop a product and validate it so that the resulting product is suitable for use and dissemination. The product developed in this research is an Android-based ethnomathematics teaching media. This teaching media was created using software and hardware. The hardware used is a laptop or computer. The software used is the Android Studio, Corel Draw, and Canva applications. The instruments used are, 1) media and material validation sheets, 2) student response questionnaires, and 3) numeracy literacy tests.

The research design or procedural model used refers to the stages that have been developed by Raiser and Mollenda (Rachmawati & Rochmawati, 2021), namely the ADDIE model. There are 5 stages of this model, namely: Analysis, Design, Development, Implementation, and evaluation. The ADDIE model is used because it has simple and systematic stages or steps. So, being able to develop or produce a product or media that is suitable for use and dissemination. The stages carried out are: (1) Analysis: in this activity, researchers analyze or collect data related to problems that occur in the learning process such as the curriculum used, the availability of teaching materials, student attitudes, the culture around where students live, students' numeracy literacy skills in geometry material consisting of plane shapes and space shapes. (2) Design: in this activity, what is carried out is preparing teaching materials, designing media, and preparing response questionnaire instruments that will be used to assess the suitability of the media being developed. (3) Development: in this stage, what is carried out is the stage of making or producing media by the design that has been made previously. After that, a validation assessment is carried out by media experts and material experts using a validation sheet. (4) Implementation: After being declared valid by media experts and material experts, the next step was to conduct a trial on class V students at SDN 022 Monto. After testing the product. Next, give a written test to students to find out students' numeracy literacy abilities after testing the product. (5) Evaluation: in this stage what is done is evaluating the product or media that has been developed. In this stage, the evaluation process is carried out by researchers by measuring the assessment of the questionnaire that has been distributed to determine the level of practicality of the product or media that has been developed.

After going through the five stages, namely: analysis, design, development, implementation, and evaluation, the researcher can conclude that the Android-based Ethnomathematics media that has been created and developed meets the appropriate category for use and distribution.

The results obtained from the research instrument will be analyzed to determine the level of achievement of the validity criteria and student learning outcomes and the practicality of the product created and developed, namely android-based ethnomathematics teaching media, and geometry material. The following is the data analysis used in this research, namely:

1. Validity Data Analysis

Validity data analysis aims to determine the suitability of the teaching media created and developed with aspects of the selected material. The validity of the teaching media created and developed is assessed using a validation sheet instrument. The validation sheet used consists of 2, namely the validation sheet for media experts and material experts. Analysis of data from validation of Android-based Ethnomathematics teaching media geometry material is a calculation of the average validator research. Analyzing data obtained from media experts and material experts then tabulating the data. Data tabulation is carried out by the validator by assessing the indicators of the assessment aspects with a checkmark at a score of 4, 3, 2, or 1. The formula used to find the validity test value is:

$$\bar{x} = \frac{\text{Total Score}}{\text{Maksimum Score}} \times 100\% \tag{1}$$

To strengthen the data from the feasibility assessment results, a qualification level of eligibility criteria was developed. The validity test value analysis criteria used are in the table below.

Table 1. Validity Categories in The Validity Analysis Of The Products Being Developed

Score Interval	Validity Criteria
0 - 55	Invalid
56 - 75	Quite Valid
76 - 85	Valid
86 - 100	Very Valid

Source: Titiek (2021)

Analyzing the validity of products that have been created and developed. Product validity is determined by calculating the total average value and then matching it with table 2. The validity category in the validity analysis of the teaching media product being developed is said to be feasible if the minimum category achieved is valid criteria.

2. Practicality Data Analysis

Analyzing the data obtained from the student response questionnaire and then tabulating the data. The data tabulation is filled in by students by filling in statements on the indicators of the assessment aspects with a tick mark at a score of 4, 3, 2, or 1. Student response questionnaire calculated using the formula.

$$\bar{x} = \frac{\text{Total Score}}{\text{Maksimum Score}} \times 100\% \tag{2}$$

Table 2. Practicality Criteria for Student Responses

Score Interval	Practicality Criteria
0 - 20	impractical
21 - 40	Less Practical
41 - 60	Quite Practical
61 - 80	Practical
81 - 100	Very Practical

Source: Titiek (2021)

3. Effectiveness of Data Analysis

This effectiveness data analysis is to see the effectiveness of the media created by giving students a numeracy literacy test to see students' numeracy literacy abilities after using learning media, then calculating the students' test results using the following formula.

$$\bar{x} = \frac{\text{Total Score}}{\text{Maksimum Score}} \times 100\% \tag{3}$$

It is said to be effective if the learning results are perfect when they reach more than the maximum completeness criteria score, namely 70 with a classical completeness percentage $\geq 75\%$.

Table 3. Media Effectiveness Level Criteria

Score (%)	Categories
81 - 100	Very Effective
61 - 80	Effective
41 - 60	Less Effective
21 - 40	Ineffective
0 - 20	Very Ineffective

Source : Afrianingrum and Rahayu (2021)

RESULTS AND DISCUSSION

This research uses the type of research and development or R & D (research and development). The product developed is a digital module with bugis cultural context to strengthen character education and increase numerative literacy ability. The development model used is the ADDIE model. This model has five stages, namely analysis, design, development, implementation, and evaluation. The stages of the ADDIE model research and development procedure are as follows.

1. Analysis

The first stage in this research is the analysis stage. At this stage what is done is to analyze or collect data related to problems that occur in learning, such as curriculum analysis which includes material, analysis of student characteristics, and analysis of the availability of teaching materials. The results obtained at this stage are as follows: 1) Curriculum analysis: This curriculum analysis is to find out what curriculum is applied at SDN 296 Lapaukke, especially in class V. The purpose of this curriculum analysis is that the curriculum is one of the important things that needs to be known first because the curriculum is a set of rules as a guide for implementing learning to achieve higher-quality education. The results obtained by researchers at SDN 296 Lapaukke show that the curriculum currently applied, especially in grade V, is the 2013 curriculum, 2) Analysis of student characteristics: The purpose of analyzing student characteristics is to find out how the nature or character of students during the learning process, regarding the results of the introduction it can be stated that the characteristics or character of students during learning can be said to be lack of enthusiasm and boredom which can affect student learning outcomes, so a learning media is needed that can help the learning process become more enjoyable and arouse the enthusiasm of students, 3)

Analysis of teaching material availability: Learning media plays a vital role in the learning process because it can make learning more enjoyable and help teachers convey information and help students understand what the teacher is teaching. Analysis of the availability of teaching materials found that the learning process at SDN 296 Lapaukke has not been maximized because it lacks the use of more varied modules, especially digital modules.

2. Design

At this stage is the design in making digital modules. The designs made are as follows: a) Digital module design: the digital module design is as follows: cover, general information, and LKPD, and b) Research instrument design: Instrument of validity, Instrument of practicality, and instrument of effectiveness.



Figure 1. Cover



Figure 2. General information, and LKPD

3. Development

In the initial and final analysis of product development, data presentation is carried out to explain the data from the evaluation of media experts and material experts who act as validators of the products made. The details are as follows.

1) Media expert validation

Researchers consulted with media experts before conducting field trials of the digital modules made. Digital modules are given to media experts to be validated as a stage in product development to determine whether or not digital modules are suitable for field trials. The results by media experts are as follows.

Table 4. Media expert validation results

No	Statement	Assessment
1	Suitability of digital modules with research objectives	4
2	The main menu and buttons work well	4
3	The design of the digital module is attractive	3
4	Clarity of instructions for using the digital module	3
5	Clarity of purpose of the digital module	4
6	The possibility of digital modules being completed	4
7	The suitability of the language used in the digital module with Indonesian language rules	4
8	Digital module sentences do not contain double meanings	4
9	Sentences in the digital module use simple language for students, easy to understand and use language that students are familiar with	4
10	Color suitability of the display	4
Total score		38
Final percentage value		95 %

Based on table 4 above, obtaining validation results from media experts is with a score of 38, the value of 38 is obtained from the assessment given by the media expert validator, and then the score from the media expert validator is recapitulated into a final percentage value with an average value of 95%

(very valid). Based on the validation results from the media expert validator, the Digital module is declared very valid and feasible for field testing.

2) Content expert validation

Consulting with content experts before conducting field trials on the content in the Digital module that was made. The results by the content expert are as follows.

Table 5. Content expert validation results

No	Statement	Assessment
1	Suitability of digital modules with geometry topics	4
2	The material in the digital module follows the syllabus	4
3	Suitability of digital modules with learning tools	4
4	Clarity of material in the digital module	4
5	Clarity of problem-solving	4
6	Clarity of purpose of the material, example questions, and evaluation	4
7	The probability of the problem being solved	4
8	The suitability of the language used in the question with Indonesian language rules	4
9	Question sentences do not contain multiple meanings	4
10	The formulation of question sentences uses language that is simple for students, easy to understand, and uses language that students are familiar	4
Total score		40
Final percentage value		100 %

Based on table 5 above, the validation results from the content expert were obtained with a score of 40, the value of 40 was obtained from the assessment given by the content expert validator, and then the score from the expert validator was recapitulated into a final percentage value with an average value of 100% (very valid). A learning media can be said to be very valid if it has a percentage value in the value range of 80% - 100%.

Based on table 4 and table 5 above, the calculation results from media experts of 95% (very valid) and content experts of 100% (very valid) obtained a percentage of 97.5% (very valid).

4. Implementation

At this stage, the digital module design that has been made is applied after improvements have been made from the input of media experts and material experts. At this stage, grade V students at SDN 296 Lapaukke are the subject of product tests conducted by researchers. During the trial, the researcher explained the material in the digital module and also explained how to use the digital module that had been made. After that, the researcher gave numeracy literacy test questions to students to see the effectiveness of the digital module that had been made. The results of the student test are presented in table 6.

Table 6. Recapitulation of Student Learning Outcomes

Effectiveness	Percentage	Criteria
Students	78,4%	Effective

Based on table 6 above, it can be seen that the average value obtained is 78.4% with effective criteria. During the last trial, researchers again explained the use of digital modules to students. Furthermore, the researcher gave a student response questionnaire and also explained how to fill out the questionnaire. Questionnaires are given to students to see the practicality of the digital modules that have been made. The results of student responses can be seen in the following table.

Table 7. Recapitulation of Students' Response Results

Feasibility	Percentage	Criteria
Students	100%	Very Practical

Based on table 7 above shows the results of student responses by having an average percentage value of 100% with a very practical category.

5. Evaluation

After completing the implementation stage of the digital module, this fifth stage is the final stage of developing the digital module that has been made. At this stage, the researcher evaluates the entire series of research.

The series of five stages of the ADDIE model, namely analysis, design, development, implementation, and evaluation, obtained data on validity,

practicality, and effectiveness so that it can be concluded that the digital modules that have been made meet the feasible category.

The module created is a Digital module in the context of Bugis culture with geometry material, namely plane figures and solid figures by utilizing the cultural buildings of the Kedatuan Luwu Traditional House and the Old Jami Mosque of Palopo City. Utilizing the surrounding buildings as a tool in providing understanding to students can have a significant impact. This is in line with the opinion put forward by Muzaini, Rahayuningsih, Ikram, and Nasiruddin (2023) that using the surrounding buildings as a learning medium can help students' understanding of geometry. The use of digital modules can foster student enthusiasm for learning so that it has an impact on improving student learning outcomes.

Based on the calculation results from media experts of 95% (very valid) and material experts of 100% (very valid), a percentage of 97.5% (very valid) is obtained. Thus, it can be concluded that the digital module in the context of Bugis culture towards strengthening character education and improving the numeracy literacy skills of grade V students at SDN 296 Lapaukke can be declared very valid for testing. This is in line with the opinion of Wulandari (2021) who says that a learning media can be said to be very valid if it has a percentage value of 80% - 100%.

The practicality of the digital module that has been made can be seen in the student response questionnaire. The results obtained from the recapitulation of the student response questionnaire, namely 100%, can be said to be very very practical. This is in line with the opinion of Winda, Sunardin, and Hardianto (2023) who say that the value of 81-100% is categorized as very practical.

The level of effectiveness of the learning media can be seen by giving numeracy literacy test questions to students after conducting trials. From the results of the recapitulation of the numeracy literacy test, students got an average score of 78.4% with effective criteria. This is in line with Safitri, Zainal, Mendila, and Hardianto (2023) which says that the value of 81-100% is categorized as very effective.

Based on data on the validity, practicality, and effectiveness of digital modules in the context of Bugis culture towards strengthening character education and improving numeracy literacy skills that have been created and developed, it can be concluded that digital modules are suitable for use and can be tested. This is in line with the opinion of Safitri, Zainal, Mendila, and

Hardianto (2023) who argue that the media is said to be feasible if it meets the three indicators, namely valid, practical, and effective. It was further explained that a feasible module that can improve students' numeracy literacy skills, is also expected to improve students' mathematical reasoning and critical thinking skills (Farida, Risqa, Rachmawati, Af'idah, Hidayah, Ni'mah, & Prasetyo, 2024; Hardianto, Baharuddin, & Safitri,, 2024).

CONCLUSION

Based on the results of the research and discussion of the development of digital modules on Strengthening Character Education And Improving Students' Numeracy Literacy skills, several things can be concluded, as follows. The development of digital modules on strengthening character education and improving students' numeracy literacy skill is feasible to use and test. This is evidenced by the calculation results of media experts by 95% (very valid) and material experts by 100% (very valid) obtained a percentage of 97.5% (very valid). The results of the student response questionnaire recapitulation of 100% can be said to be very practical. From the results of the recapitulation of student numeracy literacy tests, the average score is 78.4% with effective criteria.

Digital module development in improving numeracy literacy skills is very effective. This is evident from the numeracy literacy test results as many as 21 students are complete or 95% of the total number of students and there is only 1 student who is not complete or 5% of the total number of students.

ACKNOWLEDGMENT

Our deepest gratitude goes to DRTPM Dikti and Cokroaminoto Palopo University for sponsoring this research. In addition, we would also like to thank SDN 296 Lapaukke as a partner in organizing this research, so that it can run smoothly without missing anything. Acknowledgment is optional. The author/s is encouraged to acknowledge any parties that give a contribution to the research.

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