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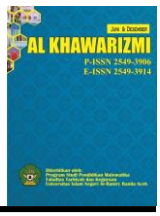

DEVELOPMENT OF A LITERACY AND NUMERATION LEARNING MODULE BASED ON LOCAL WISDOM, PROJECT BASED LEARNING, AND TRI-N TO INCREASE STUDENT INDEPENDENCE

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Abstract

Students' numeracy literacy abilities are still categorized as very low, this occurs due to a lack of teaching materials that are able to support increasing these abilities. One of the teaching materials that can support improving students' numeracy literacy skills is the use of literacy and numeracy modules. This development research aims to determine the feasibility of developing a numeracy literacy module based on local wisdom in Purworejo based on Project Based Learning and the teachings of Ki Hajar Dewantara Tri N (Niteni, Niroke, Nambahi) based on the assessment of experts and to determine the level of practicality of developing a numeracy literacy module applied in learning . This development research adopts the ADDIE model approach. Participants in this research were 29 students in class III at SDN Girigondo. The findings from this research indicate that (1) the module that has been developed has very high validity in accordance with the established criteria with an average of 3.9 on a Likeart scale based on assessments from three validators, namely material experts, media experts and language experts; (2) Students showed a positive response to the module developed with an acceptance rate of 97%, which indicates that the module meets the criteria very well in the learning context. Meanwhile, teacher responses to the module were also very positive with an acceptance rate of 100%, which confirms that this module is effective and suitable for use in the learning process.

INTRODUCTION

The education system in Indonesia always experiences developments every year. This aims to strengthen and improve the ongoing education system. One of the developments in education is that in 2021 the Minister of Education and Culture issued a new policy, namely the National Assessment (AN). Quoted from the Ministry of Education and Culture's website, the National Assessment in 2021 consists of three parts, namely the Minimum Competency Assessment (AKM), Character Survey, and Learning Environment Survey. AKM is an assessment of the basic competencies needed by students to be able to increase their own capacity and participate positively in society. There are two fundamental competencies measured by AKM, namely, reading literacy and numeracy literacy.

Numeracy literacy or also known as mathematical literacy is the ability to apply mathematical concepts and skills to solve various practical problems in everyday life, such as at school, at home, in the playground, in social life, and as a citizen (Kemendikbud, 2017). Numeracy literacy is important for students, because numeracy literacy emphasizes students' ability to implement mathematical knowledge in solving various problems that exist in their daily lives (Ernia N. & Mahmudah M. 2023)

Facts on the ground show that the literacy and numeracy skills of Indonesian students are still very low. This fact is supported by the results of the 2021 Program for International Student Assessment (PISA) survey, which ranked Indonesia 62nd out of 70 countries in terms of public literacy (Literacy, 2022). Besides According to research by Central Connecticut State University in the World's Most Literate Nations Ranking, Indonesia is ranked 60th out of 61 countries in terms of interest in reading, below Thailand (59th) and above Botswana (61st). This low rating is likely due to a lack of emphasis on the importance of literacy and numeracy skills in the basic education system in Indonesia. So there is a need for new teaching materials that are able to stimulate students' interest in literacy and numeracy.

Students' numeracy literacy is influenced by the level of students' ability to understand concepts. The process of applying concepts is closely related to numeracy literacy. Numeracy literacy requires an understanding of mathematical concepts because these concepts will be applied to everyday life problems. So, if students do not understand or misunderstand the mathematical concepts given, what happens is that students do not know what concepts need to be applied to solve the problems that occur. For this reason, it is necessary to strengthen students' understanding of mathematical concepts first as a basis for strengthening their numeracy literacy (Badi'ah dkk. 2020)

Numeracy literacy skills as a provision for the younger generation to face the challenges of life in the 21st century must be possessed by every individual at any level of education, starting from elementary school, middle school, high school, and high school/university education. Students studying at universities/universities, as the final gateway that leads them to the world of work, should have good numeracy literacy skills. Therefore, the education that students receive in higher education should make it easier for them to develop numeracy literacy skills. The reason is, higher education is the last level of education for students before actually entering the world of work (Fevi dkk. 2023)

Literacy and numeracy are the most important basic skills to be developed at primary school level. The literacy learning model is a learning approach that prioritizes the use of language skills in the learning process. This model focuses on language skills, such as

reading, writing, speaking and listening, as the main basis for its implementation. Meanwhile, numeracy is the ability to think and understand using mathematics to solve problems and being able to explain how to use mathematics to other people. These two abilities need to be possessed and mastered by students because they are the basic competencies that students need to learn (Wahyu dkk, 2023)

One of the teaching materials that can be used to improve students' literacy and numeracy skills is a module. Based on an analysis of the needs of several elementary schools in Purworejo Regency, Pituruh District, innovation is needed to improve the literacy and numeracy skills of elementary school students. This solution includes the development of a module aimed at stimulating students to develop literacy and numeracy skills. The reason for choosing this literacy and numeracy module is because this module is a learning concept that helps teachers connect lesson material with situations in everyday life through interesting reading material. It is also hoped that the use of this literacy and numeracy learning module can make students more active and increase students' interest in reading so that reading can become a habit. By using this module, it is hoped that student learning outcomes will become more meaningful. The learning process in this module is designed to take place naturally, where students are involved in reading, understanding and experiencing the material, not just receiving knowledge transfer from teacher to student. In literacy learning, the main goal is for students to be able to discover, understand and construct their own knowledge. With the right strategies and approaches, it is hoped that students will achieve good and in-depth learning outcomes.

Module development can be carried out with various materials for its substantive content, for example by including local local wisdom content. Nowadays, with the development of globalization, students are less interested in studying local culture in their region, students are more interested in foreign culture rather than studying the culture of their respective regions. The decline in students' knowledge of local culture in their area and the low literacy and numeracy skills of students also occur in Purworejo Regency. The results of discussions and observations carried out by researchers at SDN Girigondo confirmed that children need stimulation so that they can achieve an adequate literacy level. From discussions with teachers, it was also revealed that schools face challenges in providing facilities that enable children to develop their literacy and numeracy skills. Researchers observed that in practice the literacy movement had not been fully implemented in the school due to a lack of references or teaching materials available. This is a note for us to answer or resolve the problems experienced at the school.

Purworejo has a lot of local wisdom potential which is important to learn so that it remains sustainable. According to data from the Purworejo Regency Education and Culture Office, local wisdom owned by Purworejo includes the Panjang Ilang tradition during Merti Desa, Pelasan during the month of Ramadan, Ingkungan during the months of Shawwal and Rabiul Awal, the typical Purworejo dances, the Ndolalak dance and the Cing Po Ling dance, Then Purworejo also has the tourist attractions of Jatimalang Beach, Seplawan Cave, Curug Putri, Geger Menjangan Imam Puro Tomb, and many more cultural sites that have legendary stories that are rarely known by students. Purworejo also has special foods, namely clorot, lompong cake, jipang, gebleg, and gembus. Girigondo Elementary School, which is located in Pituruh District, is an area with coconut plantations, so in this area a lot of food is produced from coconut, such as coconut sugar, Jipang, and Nata de Coco.

The use of modules that utilize the local culture of the Purworejo area will be able to improve students' literacy and numeracy skills as well as enable students to study the local culture of their area so that this culture remains sustainable. In developing this module, this research also developed a learning module based on Project Based Learning, which is an innovative learning model that can encourage students to be actively involved and think creatively in searching, exploring, discovering and solving their own problems so that they can understand the material they are studying. The aim of this development is to produce Project Based Learning-based learning modules that can help students be independent. Modules are said to be helpful if they meet the criteria of being valid, practical and effective. The validity aspect is measured from the results of instrument validation carried out by the validator. The practical aspect is measured from the implementation of the module in learning, students actively work on the module. The effectiveness aspect is measured from learning completeness, student activities, and student responses to the module.

Module components that are adapted to the Project Based Learning syntax include: First Introduction, consisting of the module title, foreword, table of contents, instructions for managing learning with the module, instructions for using the module for students, a brief description of the material, Learning Achievements, benefits of the module. The second content consists of learning activities, learning indicators, learning objectives, presentation time, opening problems, prerequisite knowledge, problems with presentation that can help students understand the material, consolidation. The final three parts consist of a competency test, answer key, feedback and follow-up (Triantoro, M. 2022)

The advantages of this PjBL-based E-module are that it is attractively designed, according to the characteristics of an independent curriculum (independence and digitalization), equipped with practice questions, can be accessed anywhere, uses simple language, and is project-based so that it trains independence and provides opportunities to understand the material in depth. The aim of this research is to create electronic modules based on Project Based Learning for elementary school students. The novelty contained in this development research includes the content of the subjects selected in the E-module as well as the research model applied (Antari, PL, Widiana, IW., & Wibawa, IMC . 2023).

The learning theory that underlies Project Based Learning is constructivist theory. Knowledge is sought, explored, discovered and built, not something that is ready-made. Therefore, a learning climate is needed that can teach students to be actively involved in carrying out learning activities such as thinking creatively in searching, exploring, discovering and building the concepts and material being studied, including solving problems. The syntax of Project Based Learning is: 1) Opening the lesson with a challenging question, 2) Planning the project, 3) Developing an activity schedule, 4) Supervising the progress of the project, 5) Assessment of the product produced, 6) Evaluation (Triantoro, M. 2022)

Learning prepared by institutions must be dynamic, innovative and show uniqueness and accommodate multiculturalism, especially if the institution is general-based. The learning carried out must be able to answer the challenges and problems that occur in society. Learning that carries the concept of Ki Hajar Dewantara regarding Tri N (*Niteni, Nirokke, Nambahi*) is appropriate for students, especially children, in achieving learning goals. Children are not limited to seeing (*niteni*) what the teacher says, but children can also imitate (*nirokke*), to increase and hone their knowledge and skills, then later children can

develop their own (*Nambahi*). However, in reality, many educational institutions, especially elementary schools, have not prepared learning plans, especially those that demonstrate multiculturalism with the Tri N concept (Lestari & Sunarto. 2023).

Learning independence is a willingness to learn that comes from within the student, so that in their efforts to achieve learning goals students can control their learning based on their own considerations, decisions and responsibilities, be active individually or not depend on others. Learning independence is very important in the student's learning process. Problems that can occur due to low learning independence include decreased student learning achievement, lack of student responsibility and dependence on other people in making decisions and doing school assignments. There is another opinion which says that independence is a condition where an individual has the initiative to learn, sets learning goals and learning strategies and evaluates or reflects himself in his learning activities (Afriyola, F., Rahmi, Delyana H. 2020)

Previous research findings show that E-modules based on Project Based Learning (PjBL) have the advantages of improving learning outcomes, increasing creativity, increasing student learning motivation, training collaboration and critical thinking (Salma Huwaida Nisrina et al., 2021; Oksa & Soenarto, 2020; Siregar & Harahap, 2020). The advantages of this PjBL-based E-module are that it is attractively designed, according to the characteristics of an independent curriculum (independence and digitalization), equipped with practice questions, can be accessed anywhere, uses simple language, and is project-based so that it trains independence and provides opportunities to understand the material in depth. The aim of this research is to create an electronic module based on Project Based Learning for fourth grade elementary school students. The novelty contained in this development research includes the subject content selected in the E-module as well as the research model applied. It is hoped that this research can contribute to the development of science, especially science and science learning at elementary school level.

With similar research, researchers have taken the initiative to combine Project based Learning and Tri N (*Niteni, Niroke, and Nambahi*) in developing local wisdom-based literacy and numeracy modules that are developed to make it easier for students to access them. In general, literacy learning modules are the same as other learning modules in that they want students to be more active in teaching and learning activities, so that homeroom teachers can assess their students' understanding well. Apart from this, this research activity is also an innovation and evaluation material for class teachers, so that they are more creative and confident in trying various learning models other than traditional models which tend to be monotonous and boring for students and can be accessed by students anywhere.

This research aims to develop teaching materials whose products are in the form of modules with substantial content utilizing Purworejo local wisdom and equipped with project based learning and Tri N (Niteni, Niroke, and Nambahi) to facilitate access to increase students' independent abilities.

RESEARCH METHODS

This research uses a Research & Development (R&D) research approach. Sukmadinata (2015) defines development research as a process or step to create new products or improve existing products, with clear responsibilities. Another opinion from Borg and Gall quoted in the work of Sukmadinata (2015) states that development research

is a process used to develop and validate educational products. This research and development research aims to identify practical problems in the field and produce new knowledge through the application of methods. The focus of development research is to provide improvements or improvements in the field of education. Sugiyono (2019) also explains that research and development is a research method used to produce certain products and test the effectiveness of the products that have been developed.

Types of research

The development model used in this research is the ADDIE model. The ADDIE model is a research model design that is used to develop complete learning products with steps that are simple and easy to learn (Asad, Hassan and Sherwani, 2014). The ADDIE model includes five steps: (1) analyze; (2) design; (3) develop; (4) implementation; and (5) evaluate. The stages in this research are divided into 2 stages, namely the literacy module creation stage (analyze, design, and develop) and the implementation and evaluation stages (testing the practicality of the literacy module (Sugiyono, 2019).

Time and Place of

Research activities were carried out in March – June 2024. The research location was at SD Negeri Girigondo, Pituruh District, Purworejo Regency, with research subjects being Grade III students.

Procedure

In the first stage, researchers analyzed the local wisdom found in Purworejo Regency, which could be in the form of artifacts, cultural products, monuments, cultural heritage and so on. After conducting literature studies and collecting materials in the form of cultural products in Purworejo Regency, the module design was then designed to suit the theme and curriculum (prototype 1/blue print). Next, the module is developed based on the design. The result of the development is then called prototype 2. After the module is developed, the next stage is to test the quality of the module. The feasibility of the module is based on the assessment of language, material and media experts. The results of the three experts' assessments were averaged and concluded based on predetermined criteria. Practicality testing is carried out by paying attention to student and teacher responses to the application of the module in learning. To collect data about the level of practicality, researchers used a questionnaire provided in the form of a Google Form.

Data Sources, Instruments, and Data Collection

In this research, data collection techniques include several methods, namely interviews, questionnaires, observations, as well as pretest and posttest questions. To see the process of improving literacy and numeracy skills in schools, researchers conducted interviews with teachers as a source of information. The data collection technique was carried out through questionnaires when validated by three experts, namely media experts, language experts and material experts, and in field trials questionnaires were filled out by students. Observations are used to obtain an overview of activities to improve literacy and

numeracy skills using the module products developed. Meanwhile, the pretest and posttest questions are used to determine the effectiveness of literacy and numeracy module products in improving students' literacy and numeracy skills as well as local wisdom in their area.

Data analysis technique

In this research, data collection techniques include several methods, namely interviews, questionnaires, observations, as well as pretest and posttest questions. To see the process of improving literacy and numeracy skills in schools, researchers conducted interviews with teachers as a source of information. The data collection technique was carried out through questionnaires when validated by three experts, namely media experts, language experts and material experts, and in field trials questionnaires were filled out by students. Observations are used to obtain an overview of activities to improve literacy and numeracy skills using the module products developed. Meanwhile, the pretest and posttest questions are used to determine the effectiveness of literacy and numeracy module products in improving students' literacy and numeracy skills as well as local wisdom in their area.

The instruments used for data collection were module validation sheets for media experts, language experts and material experts, teacher and student response questionnaires. This instrument must be validated by experts. The module feasibility data analysis technique uses a Likert scale. The scores obtained are then converted into values on a scale of four. Feasibility of module development results from the material, language and media aspects, from data in the form of scores converted into qualitative data with a four scale. The reference for changing the score to a four scale is as follows.

Table 1
Criteria for average expert validation results

No.	Average value	Classification
1.	1,00 < x ≤ 1,75	Not feasible
2.	1,75 < x ≤ 2,50	Not worth it
3.	2,50 < x ≤ 3,25	Worthy
4.	3,25 < x ≤ 4,00	Very Worth It

A module is said to be feasible if the average score reaches the appropriate or very appropriate criteria. To measure its practicality, students' and teachers' responses after implementing the developed media were observed through the use of a questionnaire. These responses were evaluated using a Likert scale for answers to the teacher response questionnaire. Next, analyze the teacher's response calculations using a predetermined formula.

$$Mark = \frac{Total\ score\ obtained}{Maximum\ score} \times 100\%$$

After that, the results obtained are changed or converted into the criteria set out in Table 2 as follows:

Table 2
Criteria for average expert validation results

No.	Percentage of student and teacher responses	Classification
1.	20 < R ≤ 40	Not enough
2.	40 < R ≤ 60	Enough
3.	60 < R ≤ 80	Good
4.	80 < R ≤ 100	Very good

Teacher and student response indicators are considered positive if their responses fall into the good or very good category.

RESEARCH RESULTS AND DISCUSSION

Research result

The development of a numeracy literacy module based on Purworejo local wisdom, Project Based Learning and Tri N (Niteni, Niroke, Nambahi) for elementary school students has been validated to measure the feasibility of the module developed through suggestions and assessments from experts in three fields, namely language experts and media experts. , and material experts. Validation by these three experts is used to determine the appropriateness of the presentation and the appropriateness of the module content. To measure the level of practicality of using the module, this product has been tested on class III students at SDN Girigondo to find out the practicality of the module being developed. Apart from being tested on students, the module was also given to class teachers to get responses and the answers were written on a questionnaire that had been given by the researcher.

Module Feasibility Test Results

The module developed has gone through a feasibility/validation testing process by experts. The results of expert input are then revised and consulted continuously before being tested in schools. Once feasible, the module is tested to obtain practicality data, in detail the results of the validator assessment are as follows.

Table 3
Results of the validator assessment of the module

No.	Rated aspect	Media	Material Validator	Language
1.	Content Eligibility	4,0	3,4	4,0
2.	Feasibility of Presentation	3,9	3,8	3,9
3.	Average		3,9	
4.	Criteria		Very Worth It	

Based on the assessments of the three validators, the average rating is 3.9. Thus, it can be concluded that the numeracy literacy module based on local wisdom in Purworejo, Project Based Learning and Tri N (Niteni, Niroke, Nambahi) is in the very feasible category. Module Practicality Test Results After the module has been validated by experts, namely material experts, language experts and media experts and there are no revisions, the next step is to test the product using a small scale. A small-scale trial was carried out on class III students at SDN Girigondo with a total of 29 students, conducted face-to-face. After testing the product, students and teachers were asked to fill out a response questionnaire provided by researchers to find out how practical the Purworejo local wisdom-based numeracy literacy module is for elementary school students. The following are the results of student responses:

Table 4
Recapitulation of the results of class III student responses

No	Rated aspect	Feeling		Percentage	
		Like	Dislike	positive	Negative
1	How do you feel about :				
a	Material in the module	29		100%	
b	Purworejo culture as learning material	28	1	96,6%	3,4%
c	The image presented	29		100%	
d	Project Based Learning Guide	28	1	96,6%	3,4%
e	Tri N Guide	28	1	96,6%	3,4%
f	Technology in the module	29		100%	
No	**Rated aspect**	**New thing**	**Not new**		
2	What do you think about:				
a	Subject matter	28	1	96,6%	3,4%
b	Literacy module	27	2	93,1%	6,9%
c	Technology in modules	29			
d	How to study on the module	27	2	93,1%	6,9%
No	**Rated aspect**	**Interested**	**Not interested**		
3	Are you interested in following the learning presented in the module?	27	2	93,1%	6,9%
No	**Rated aspect**	**Yes**	**No**		
4	Your opinion about the numeracy literacy module				
a	Can you understand the material in the module?	27	2	93,1%	6,9%
b	Are you interested in the appearance (writing, illustrations, images and image layout) contained in the module?	28	1	96,6%	3,4%

From the results of student responses, an average of 97% gave positive responses and only 3% gave negative responses to the module, which means the module developed met the "very good" criteria.

Table 5
Recapitulation of Class III Teacher Response Results

No.	Rated aspect	Interesting	Not attractive
1.	What do you think you with :		
a	Material content in the module	✓	
b	Content of Purworejo local wisdom in the module	✓	
c	Linkage of modules to themes	✓	
d	Evaluation of the module with cultural aspects of each meeting	✓	
No	**Rated aspect**	**New**	**Old**
2.	What do you think about		
a	Material content in the module	✓	
b	Content of Purworejo local wisdom in the module	✓	
c	Linkage of modules to themes	✓	
d	Evaluation of the module with cultural aspects of each meeting	✓	
No	**Rated aspect**	**Interested**	**Not interested**
3.	Are you interested in teaching numeracy literacy modules based on local wisdom, Project Based Learning and Tri N?	✓	
No	**Rated aspect**	**Yes**	**No**
4.	Your opinion about Student Books and Teacher Books		
a	Did you find it easy to use this module?	✓	
b	Is it easy for you to teach this module to students?	✓	
c	Are you interested in the appearance (writing, illustrations, images and location of images) contained in the module?	✓	

Meanwhile, the results of the teacher's response show that all components of the question submitted gave a positive response, namely 100%

DISCUSSION

This research was conducted because there was a problem in elementary schools, namely the low literacy and numeracy skills of elementary school students. This problem occurs due to a lack of teaching materials that support increasing student literacy and numeracy. One of the teaching materials that can be used to increase students' interest in literacy and numeracy is the use of modules. Local wisdom in the region can also be

integrated into modules to make it easier for students to learn while fostering a love of regional culture for elementary school students. To make it easier for students to use it, product developers will also include project based learning and Tri N which can make students feel more enthusiastic about learning because its use can be accessed anytime and anywhere.

To implement this module, testing is required first so that the module can be declared feasible and practical to use. The tests applied in this research include feasibility tests and module practicality tests. The module can be used if it meets the product feasibility and practicality criteria. The feasibility test was carried out by testing the module with three experts, namely media experts, material experts and language experts. This module has received the criteria for being very suitable for use as evidenced by table 2.1. The average response from experts is 3.9, which means that the module is very suitable for use. After being declared feasible, it is necessary to carry out a practical test which is carried out through student and teacher responses through a questionnaire that has been given by the researcher.

Based on the results of student responses, 97% of them gave positive responses to the module, while only 3% gave negative responses, indicating that the module met the "very good" criteria. Apart from that, the results of the teacher's responses showed that all components of the questions asked received 100% positive responses. Thus, it can be concluded that the module developed is very practical for use in learning and meets the "very good" criteria.

Based on the student and teacher response questionnaire, it can be concluded that the Purworejo local wisdom-based numeracy literacy module for elementary school students developed for class III students at SDN Girigondo is very interesting and can help convey the material in the numeracy literacy module. The material presented in the Purworejo local wisdom-based numeracy literacy module is also arranged systematically so that students can easily understand the material, thus increasing students' interest in increasing literacy about the local culture of the Purworejo area.

CONCLUSION

The numeracy literacy skills of elementary school students are still in the low category. One of the teaching materials that can support student learning activities to make them more meaningful is a module. In this development research, the teaching materials developed are numeracy literacy modules based on Purworejo local wisdom, Project Based Learning and Tri N for elementary school students using research procedures and the ADDIE model development model which has 5 stages, namely: Analysis, Design, Development, Implementation and Evaluation. The feasibility of the Purworejo local wisdom-based numeracy literacy module was assessed by three validators. The level of validity of the Purworejo local wisdom-based numeracy literacy module is based on three experts, namely material, language and media experts. The average score from the three experts is in the "very valid" category. The digital literacy module based on local Purworejo culture was tested by students and teachers to measure its level of practicality. Based on the results of the recapitulation of student responses, a percentage of 97% positive responses was obtained, and the module met the "very good" criteria. Meanwhile, the results of teacher

responses reached a percentage of 100% positive responses, which also met the "very good" criteria.

The suggestion for teachers in this development is that teachers can utilize appropriate learning resources to facilitate literacy and numeracy activities, one of which is by using modules. For students, the advice given is that students should always hone their literacy and numeracy skills because these skills are very important to learn later. For other researchers, this research can be used as a reference for developing other teaching materials that can facilitate elementary school students' literacy and numeracy activities.

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