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DEVELOPMENT OF DIGITAL TEACHING MODULES BASED ON LOCAL WISDOM IN IMPROVING ELEMENTARY STUDENT LITERACY IN MOVER SCHOOL PROGRAM

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Abstract

The purpose of this research is to develop a digital teaching module to improve student literacy. This research uses a type of study known as Research and Development (R&D), which aims to create a new product or improve an existing one. Specifically, this study follows the R&D methodology proposed by Thiagarajan (1974), which outlines the steps of research and development as a 4D model: Definition, Design, Develop, and Disseminate. The subjects of this study are six elementary school principals and six fourth-grade teachers in Palangka Raya City, East Kotawaringin Regency, and Kapuas Regency. To collect the necessary data, the researcher used observations, interviews, documentation, and questionnaires. The feasibility of digital teaching modules based on local wisdom is validated by subject matter experts and media (design) experts. According to the validation results from the validators, the material aspect received a rating of "Very Feasible" with a percentage of 87.6. The media aspect, based on validation by experts, received a rating of "Very Worthy" with a percentage of 80,4%. Based on the results of the trial, it shows more interest and attention to reading learning materials through their respective gadgets, so that the development of digital teaching modules based on local wisdom is able to increase student literacy in the SD/MI Mover School Program.

Keywords Local Wisdom, Student Literacy, Digital Teaching Module, Development.

INTRODUCTION

The progress of the times in the digital era needs to be taken advantage of, such as the development of teaching modules based on local wisdom that aim to improve digital literacy and increase understanding of local culture. Literacy is a fundamental skill that every student must have. However, many elementary school students still face difficulties in understanding the content of the literature used, which affects their reading and writing abilities (Hausknecht et al., 2021;Laila et al., 2021;Salmia et al., 2024;Ermiana et al., 2024), so it is necessary to improve their abilities, especially in using digital technology, so that the habits of students who like digital can be adjusted in learning, which, of course, is also digital-based(Ramdas et al., 2023;Jiménez Sierra et al., 2024). This step is taken to realize more meaningful learning (interesting and interactive), this learning is certainly able to build student motivation and involvement (Sjöberg &Lilja, 2019;Akram et al., 2022). Student involvement in learning is certainly related to the ability to access learning resources (Valverde-Berrocoso et al., 2021;Andoniou, 2024) In this study developed a digital teaching module was developed based on local wisdom.

The development of digital teaching modules based on local wisdom has significant potential to be used as relevant and interesting teaching materials for students. Utilizing teaching modules based on local wisdom can help students understand the material more easily because it is closely related to their daily lives (Munajah et al., 2023). In daily life, students are very necessary to get to know the culture (Putry et al., 2018;Pageh &Permana, 2020;Sani et al., 2021). The use of digital technology in education can increase student engagement and make the learning process more interactive and enjoyable. E-modules based on local wisdom can be a solution to improve students' cultural literacy and critical thinking skills. (Qumillaila et al., 2022;Temirkhanova et al., 2024;Eko Wahyudi et al., 2025). In addition, the use of local wisdom in teaching modules helps students learn new knowledge in the context of their daily lives, which can improve the understanding and application of that knowledge (Sarangapani et al., 2019;Sofyan et al., 2019). The use of digital modules also has implications for improving digital literacy (Reddy et al., 2021;Siswanto et al., 2022;Suwarto et al., 2022;Bansal &Choudhary, 2024).

The Independent Curriculum is implemented in several Driving Elementary Schools from the results of the previous selection. Then, for now, the independent curriculum has been socialized and implemented by all elementary/secondary education units in Indonesia (Mauinda, 2022). Palangka Raya City is represented by SDIT Al Furqan and MIS NU Palangka Raya, as well as East

Kotawaringin Regency by SDN 2 Mentawa Baru and SDIT Arafah, and Kapuas Regency by MIN 1 and SDN 3 Selat as School Mover SD/MI that have implemented the Independent Curriculum because these schools have shown commitment and readiness in implementing more flexible curriculum principles, based on student-centered learning, and provide freedom for teachers to innovate in the learning process. The Merdeka Curriculum emphasizes the development of students' competencies in accordance with their interests and talents, as well as providing space for learning that is more contextual and relevant to the needs of the times. Therefore, these schools were chosen as the driving force in the implementation of the curriculum, as they already have the readiness of infrastructure, human resources, and support from the local government to implement this innovative curriculum change.

Based on an interview with the head of MIN 2 Palangka Raya City on Wednesday, July 20, 2022, data was obtained that MIN 1 and MIN 2 Palangka Raya City are schools that are pilot projects for the independent curriculum. Furthermore, the researcher and the team carried out community service, which was packaged in technical guidance for the implementation of the independent curriculum for 4 days. However, in practice, teachers still do not fully understand how to prepare teaching modules. Strengthening literacy needs to be considered, in addition to being able to increase weak literacy among students, it can also help the running of independent curriculum policies. On January 11, 2023, the researcher conducted interviews and observations back to MIN 2, based on the results of observations and observations on the teaching modules prepared by teachers, there are still several teaching modules that are not suitable, such as starter questions, connecting the material with Pancasila student profiles, and assessments. In addition to low literacy among students that needs to be improved, the value of local wisdom also needs to be improved. Based on the problems that have been described, the researcher developed a digital teaching module based on local wisdom to improve the digital literacy of MI/SD students.

Based on previous research that examined the development of teaching modules, namely the first, according to Siswanto et al. (2022), this study has shown that integrating digital learning with local wisdom can significantly improve students' problem-solving skills and digital literacy. For example, a study of high school students showed that such integration was both practical and effective, leading to significant improvements in physics problem-solving skills and digital literacy. Second, according to Munajah et al. (2023), the focus of this research is storytelling in digital form to improve the writing skills of elementary school students. Teachers consider this approach important

to improve students' expression through writing. Third, research by (Jung et al., 2024) has a research focus on the COVID-19 Pandemic, which has underlined the need for digital literacy among teachers to support distance education. Strategies to improve teachers' digital literacy include training on digital devices, online content development, and digital teaching methods.

Fourth, by (Rahmawati et al., 2024) A systematic review of digital literacy of secondary school teachers reveals that although most teachers are at the secondary level, there is still a need for continuous evaluation and improvement of digital literacy training programs. Fifth, research (Sismulyasih Sb et al., 2021) The existence of teaching materials based on local wisdom can improve the reading ability of elementary school students. Other studies have found that textbooks that incorporate local wisdom are more effective in improving reading and writing skills compared to materials that do not integrate those elements (Laila et al., 2021).

Based on the elaboration of several previous studies, this study focuses more on the development of digital teaching modules that incorporate the value of local wisdom, with the main goal of improving the literacy of elementary/middle school students, while previous studies are more general or focus on other aspects such as teachers' digital literacy, digital storytelling, or students' reading ability, without the same emphasis on teaching modules based on local wisdom.

METHOD

These studies use a type of research known as Research and Development (R&D), which aims to create new products or improve existing ones. In particular, this study follows the R&D methodology proposed by Thiagarajan (1974), which outlines the steps of research and development as a 4D model: Define, Design, Develop, and Disseminate.

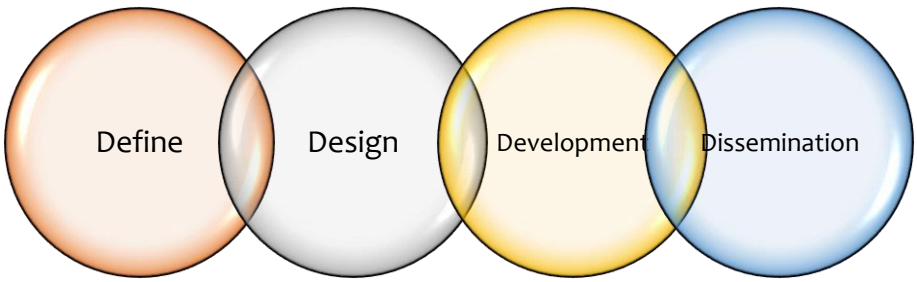

Figure 1. 4D Development Model Flow

Based on the above figure, the development design according to the 4D model can be explained as follows: Define (Definition), which involves activities to determine the developed product along with its specifications. At this stage, researchers conduct research that needs analysis,

curriculum analysis, material analysis, and student characteristics analysis. Then, in the Design phase, the researcher designs products using flowcharts and storyboards. In the Development stage, the researcher creates a validated product until it produces a valid product. The last step is Dissemination, which involves spreading the product that has been developed to places that are on an outside scale.

The subject determination technique in this study uses Purposive sampling. The researcher focused on three elementary schools and 3 MI School Movers in Palangka Raya City, East Kotawaringin Regency, and Kapuas Regency. The plan of the research location in Palangka Raya City was represented by SDIT Al Furqan and MIS NU Palangka Raya. East Kotawaringin Regency is SDN 2 Mentawa Baru and SDIT Arafah. Kapuas Regency MIN 1 and SDN 3 Selat. The six elementary schools/MI in terms of facilities are very adequate in computer facilities and support literacy. To collect the necessary data, researchers used a variety of data collection techniques, including tests, questionnaires, observations, interviews, and documentation. After the data is collected, it is analyzed using qualitative and quantitative analysis techniques. These five types of data are processed according to the stages of this research (Define, Design, Development, and Dissemination). The subjects in this study are 6 Principals of Elementary / MI, 6 Grade IV Teachers in Palangka Raya City, East Kotawaringin Regency, and Kapuas Regency. Data mining in this study was carried out by using various data collection techniques.

The data collection method using tests is carried out to obtain data on student learning outcomes related to the teaching modules that have been implemented. The tests used are multiple-choice and limited-description using LMS applications. Data collection through questionnaires was carried out to assess the feasibility of media experts, content experts, and teacher and student responses regarding the development of digital teaching modules based on local wisdom to improve student literacy in elementary schools. Observations were carried out to observe the completeness of KSOP/KOM documents and learning tools for grade IV teachers. By making this observation, the researcher can more easily conduct data mining because he really sees the process directly and can find out the problems that occur when learning development is carried out.

Other data collection was carried out by interview. Interviews are a form of verbal communication that functions as a conversation to gather information. The researcher conducted interviews with 6 grade IV teachers and 6 Principals of Elementary / MI in Palangka Raya City, East Kotawaringin Regency, and Kapuas Regency to obtain information about the implementation of the

independent curriculum and the implementation of student literacy. In carrying out the documentation method, the researcher examined written materials such as curriculum documents, Learning Objective Flowcharts, teaching modules, and the implementation of student literacy. Once the data was collected, the researchers analyzed it using descriptive analysis techniques, which means they aimed to describe the data collected regarding the implementation of an independent curriculum. Reviewing all the information gathered through observations, interviews, and documentation is the first step in analyzing the data collected for this project. The information is then methodically organized to aid in understanding and providing context. Once the data is collected, it is then organized or sorted into specific categories using a four-part process, as described by(Huberman, 1998) Data collection, data reduction, data display, and conclusion image. The results of the validation of material and media experts are calculated using the following formula:

$$\boldsymbol{P = \frac{\sum x}{\sum xi} \times 100\%}$$

Information:

$\boldsymbol{P}$ = Percentage

$\sum \mathbf{x}$ = Score obtained

$\sum \mathbf{xi}$ = Maximum score

The data in this research consists of primary data and secondary data. The primary data in this research are direct interviews with 6 grade IV teachers in East Kotawaringin Regency and Kapuas Regency. At the same time, secondary data is sourced from literature and library books or data from companies related to the problem being studied. The source of this research data is sourced from informants consisting of six Principals of Elementary / MI Schools, East Kotawaringin Regency, and Kapuas Regency.

FINDINGS AND DISCUSSION

Findings

The research was conducted in 3 elementary schools and 3 MI School Movers in Palangka Raya City, East Kotawaringin Regency, and Kapuas Regency. Palangka Raya City is represented by SDN 1 Menteng and MIN 1 Palangka Raya. East Kotawaringin Regency is SDN 2 Mentawa Baru and SDIT Arafah. Kapuas Regency is MIN 1 and SDN 3 Selat. The six elementary schools/MI in terms of facilities are very adequate in computer facilities and support literacy. The results of this

research and development are the development of digital teaching modules based on local wisdom made using Learning Management System (LMS) software to improve student literacy at the elementary/middle school level.

Definition of Digital Teaching Modules Based on Local Wisdom to Improve the Literacy of MI/Elementary Students (Define)

The digital teaching module based on local wisdom to improve student literacy is a type of electronic teaching material that is systematically packaged to make it easier for students to understand and access learning materials with the characteristics of each school in the area. Some teachers and schools are still not fluent in applying the teaching module. In fact, with this digital teaching module based on local wisdom, students are expected to indirectly enter the natural environment and society, so that the learning process in the classroom becomes meaningful and students are more easily understood, because the learning tends to focus on the area where students live.

The researcher conducted a needs analysis, curriculum analysis was carried out focusing on Learning Flows and Objectives (ATP) and Learning Outcomes (CP), material analysis in accordance with Learning Outcomes (CP) and Learning Goal Flow (ATP), and analysis of student characteristics was carried out by researchers by observing 6 Elementary / MI School Mover, namely 2 Elementary / MI in Palangka Raya City, 2 SD/MI in East Kotawaringin Regency and 2 SD/MI in Kapuas Regency.

Designing Digital Teaching Modules Based on Local Wisdom to Improve the Literacy of MI/Elementary Students (Design)

The design stage of the digital teaching module is based on local wisdom in accordance with the curriculum analysis. The product development design that the researcher carried out was to create a StoryBoard, which can be seen in the following image.

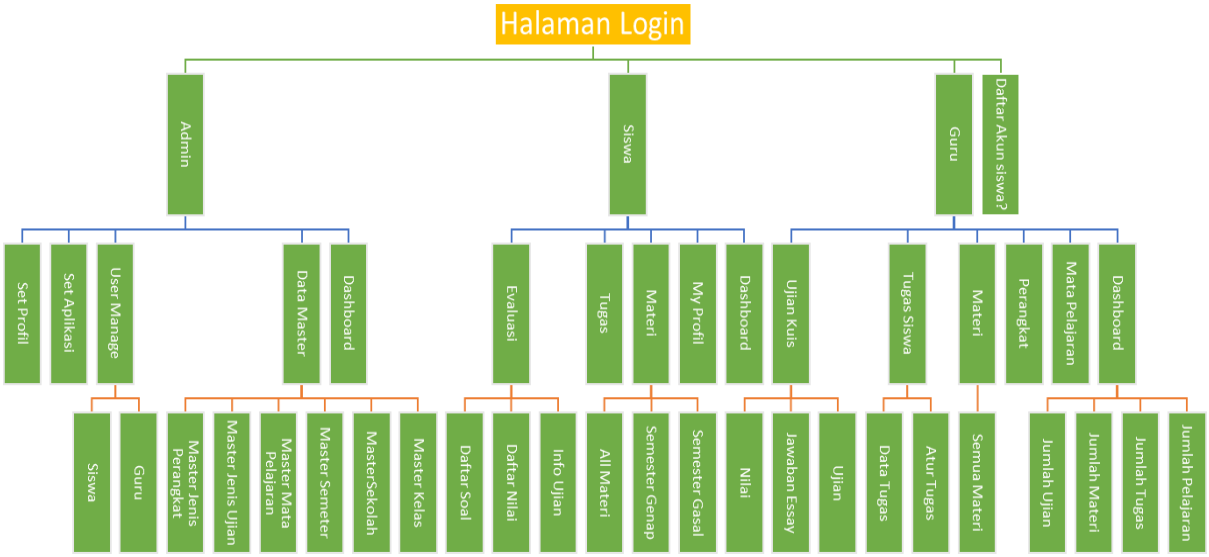

Figure 2. Storyboard Teaching Module Based on Local Wisdom

Development of Digital Teaching Modules Based on Local Wisdom to Improve the Literacy of MI/SD Students (Development)

The development of digital teaching modules based on local wisdom, developed using the Learning Management System (LMS) application, resulted in independent curriculum-based teaching module products. The development of this digital teaching module was conducted using the 4D development model. The development of e-module learning media based on the Learning Management System (LMS) using the ADDIE development model produces learning media that provide easy access to learning materials because they can be accessed anytime and anywhere, so as to support online learning. The following are the results of the development of digital teaching modules based on local wisdom (The complete digital teaching module based on local wisdom can be accessed via the link (https://bahanajardigital.com/).

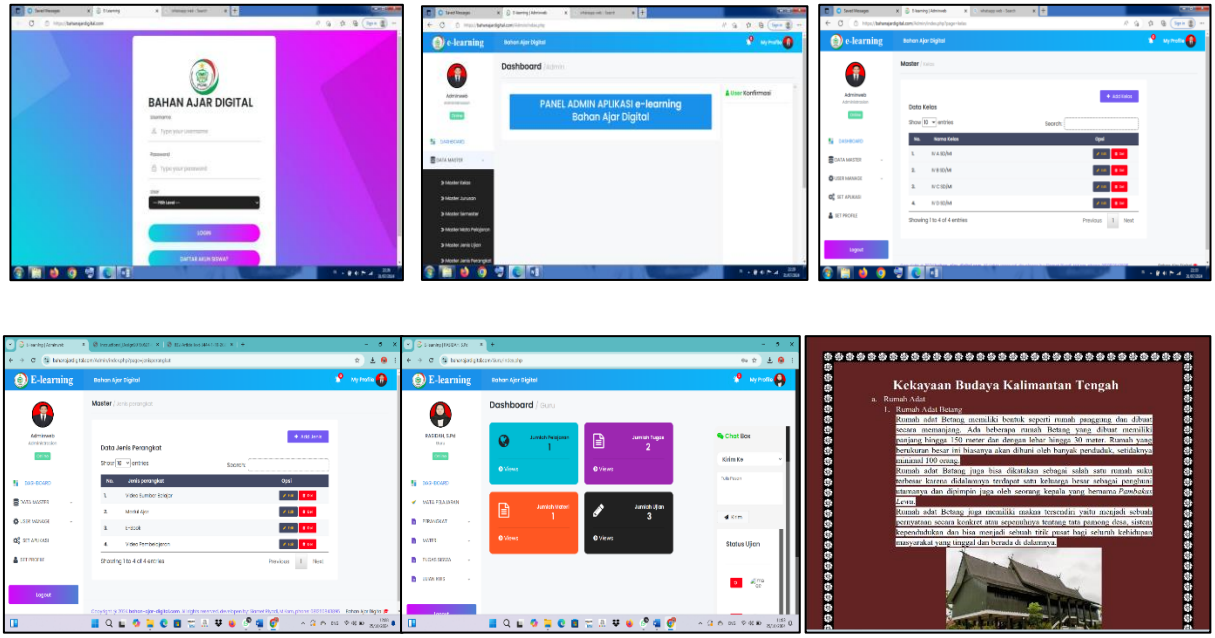

Figure 3. Initial Appearance of Digital Teaching Modules Based on Local Wisdom

At the development stage, it aims to produce a digital teaching module product based on local wisdom that has been revised and said to be feasible based on the results of validation by material experts and media experts. A material expert consists of one person who has the ability to prepare the material so that it is feasible to validate the material that has been developed. The media expert (design) consists of one person who has the ability in learning media so that it will provide valid validation of the digital-based teaching module products that have been developed. Subject Matter Expert Validation;

Table 1. Average Material Expert Vaidasi

Material Aspects	Subject Matter I	Material Expert II	Average Score	Information
Eligibility Aspects of Content	91,6%	93,75	92,6%	
Aspects of Presentation	84,3%	84,3%	84,3%	Highly Worth It
Eligibility Contextual Feasibility Aspects	83,3%	88,8%	86,1%	
Average Number of Material Aspects			87,6%	

The validation of material experts in this study uses three aspects, including the feasibility aspect of content, the feasibility aspect of presentation, and the aspect of contextual feasibility, which consists of 29 assessment items in total on material validation. The assessment category used in the study was "Very Feasible" for the acquisition of a score percentage of 76 - 100%. The category is "Feasible" if the percentage of score obtained is 51 – 75%. The "Less Feasible" category for the acquisition of a score percentage of 26 – 50% and the category "Not Feasible" for the acquisition of a score of 0 – 25% (Arikunto, 2010). Validation of subject matter experts is carried out once. The results of the overall material expert validation calculation reached 87.6%, which was included in the "Very Feasible" category.

Media Expert Validation

Table 2. Media Expert Validation Results 1

Media Member 1	Media Member 2	Overall Results	Information
88,8%	81,25%	80,4%	Highly Worth It

The validation of media experts (design) in this study uses two aspects that are assessment indicators, namely software engineering and visual communication, with a total of 16 assessment items. The software engineering aspect consists of the feasibility of the teaching module in terms of the ease of materials; Easy to store, easy to use, and easy to maintain. Meanwhile, in the aspect of visual communication, the feasibility of the teaching module is realized if it meets several aspects, namely communicative (language is easy to understand and effective). Furthermore, judging from the appearance of the teaching module, which is manifested in the typography of the writing (type and size of selected letters), the images or icons presented, the suitability of the images that support the material, layout settings, color composition, and color selection compatibility.

The assessment category used in the study was "Very Feasible" for the acquisition of a score percentage of 76 - 100%. The category is "Feasible" if the percentage of score obtained is 51 – 75%. The "Less Feasible" category for the acquisition of a score percentage of 26 – 50% and the category "Not Feasible" for the acquisition of a score of 0 – 25% (Arikunto, 2010). The results of the calculation of the validation of the overall media experts reached 80.4%, so the digital teaching module based on local wisdom was categorized as "Very Feasible".

The finished validated product is tested at one of the MIs in Palangka Raya. The trial process was accompanied directly by the homeroom teacher of grade IV, namely Mrs. Rasidah. Researchers. The students seemed enthusiastic about using this digital teaching module. The students had previously been instructed by the teacher to bring a device in the form of a cellphone or laptop. Based on the results of the trial, it shows more interest and attention to reading learning materials through their respective gadgets. This is inversely proportional to the situation where teachers give instructions to read learning materials only through textbooks. Based on this reality, it proves that students today tend not to be able to separate from their cellphones or gadgets. Therefore, the use of gadgets should be used in learning as an educational medium so that they can have an impact on increasing learning motivation in students. After students have read and understood the learning material, students will be directed to work on multiple-choice questions or quizzes. After taking the quiz, students can see their quiz scores in their respective accounts. In addition to being able to see their own scores in each student's account, they can see the 10 people who obtained the highest score on the leaderboard. Meanwhile, to find out all students' scores in the class, it can only be seen on the teacher's account.

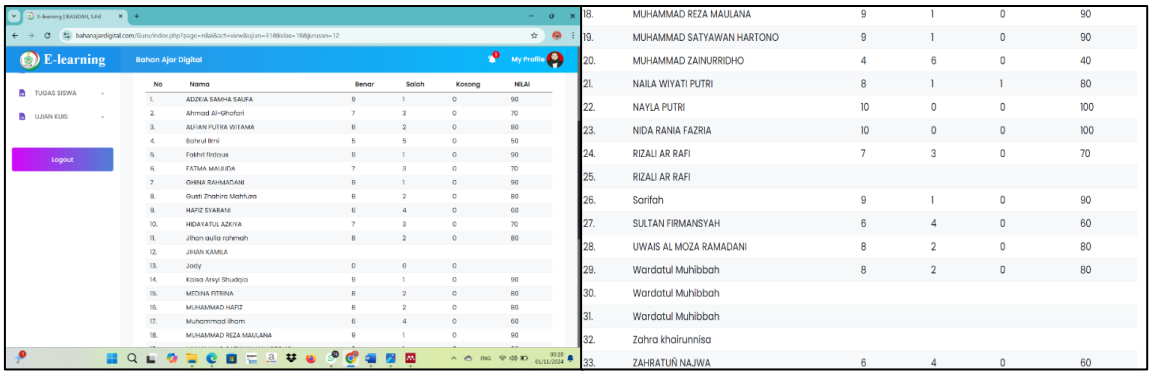

Figure 4. Student Score Data After Taking the Quiz

Data in the form of student grades can be accessed through the teacher's account. The scores obtained by students who did Multiple Choice (PG) questions were, on average, quite good. Thus, the digital teaching module based on local wisdom can show the progress of student learning shown through exam results from the data stored in this digital teaching module, so it can be said that this teaching module performs the functions of the LMS well.

Dissemination of Digital Teaching Modules Based on Local Wisdom to Improve Literacy of Elementary/MI Students

The deployment of digital teaching modules based on local wisdom was implemented in several schools, namely the 6 SD/MI School Mover in Palangka Raya City, East Kotawaringin Regency, and Kapuas Regency. The plan of the research location in Palangka Raya City was represented by SDIT Al Furqan and MIS NU Palangka Raya. East Kotawaringin Regency is SDN 2 Mentawa Baru and SDIT Arafah. Kapuas Regency MIN 1 and SDN 3 Selat.

Discussion

The development of digital teaching modules based on local wisdom is able to increase student literacy in the SD/MI Mover School Program. Teaching modules that integrate local wisdom can improve students' writing and reading skills. The use of texts that are appropriate to the student's level of difficulty and based on local wisdom has been proven to be effective in improving the early reading skills of elementary school students (Sismulyasih Sb et al., 2021;Laila et al., 2021;Eko Wahyudi et al., 2025). Digital teaching modules that incorporate local wisdom can improve students' digital literacy. Studies show that digital learning integrated with local wisdom can significantly improve students' digital literacy skills (Siswanto et al., 2022;Munajah et al., 2023;Syahfitri &Muntahanah, 2024). So that the use of interactive digital media based on local wisdom can also improve students' critical thinking disposition, which is an important part of digital literacy.

The use of digital teaching modules based on local wisdom can increase student involvement and motivation in the learning process. Students tend to be more interested and motivated when learning materials are relevant to their culture and environment (Nasrudin et al., 2019; Bulkani et al., 2022; Girdzijauskienė et al., 2022). Teaching modules that incorporate local elements can make learning more contextual and meaningful for students, thereby improving their learning outcomes (Mudjid et al., 2022). Teaching modules can include various media such as texts, images, videos, and animations that contain elements of local wisdom to make learning more interesting and interactive(Widiaty et al., 2018). The use of technology such as e-modules and digital learning platforms can facilitate access and distribution of learning materials based on local wisdom(Widianto et al., 2020; Eko Wahyudi et al., 2025). The integration of technology in learning allows students to learn independently and develop their digital literacy skills(Amrita et al., 2020; Suwarto et al., 2022). So that the development of digital teaching modules based on local wisdom is an

effective strategy to improve student literacy in the SD/MI Mover School Program. Integrating local elements in digital learning, students not only improve their literacy skills but also become more engaged and motivated in the learning process. Proper implementation and continuous evaluation will ensure this teaching module provides maximum benefits to students. The development of digital teaching modules that incorporate local wisdom is an effective strategy to improve literacy among students in elementary schools (SD/MI Mover School Program. Increasing digital literacy based on local wisdom has been proven to significantly improve students' reading skills, so teachers consider this method important to improve students' abilities (Abiddin et al., 2022; Munajah et al., 2023; Asmayawati et al., 2024).

The validation results for the materials and media showed that they were very feasible and suitable for educational use, with the validation of subject matter experts reaching a percentage of 87.6% and the validation of the media reaching 80.4%. These findings are supported by several studies that consistently report a high percentage of validation and categorize materials and media as very good or very feasible (Hidayati et al., 2020; Br Sitepu et al., 2021; Setiawaty et al., 2022;Annuryadi et al., 2023). Research has shown that digital learning integrated with local wisdom is effective in improving a wide range of literacy skills. For example, significant improvements in physics problem-solving skills and digital literacy were observed when local wisdom was incorporated into learning materials (Siswanto et al., 2022). The use of local policy-based textbooks has also been found to be more effective than traditional teaching materials in improving students' reading and writing skills (Laila et al., 2021).

CONCLUSION

Digital teaching modules based on local wisdom have been developed to improve student literacy by incorporating the unique characteristics of each school. The development of this module uses the Four-D research model, which consists of four stages: define, design, development, and dissemination. At the definition stage, a needs and curriculum analysis is carried out with a focus on learning objectives and learning outcomes, as well as an analysis of student characteristics through observation. The design stage includes creating flowcharts, storyboards, and validation instruments. In the development stage, the modules are tested and validated by material and media experts with very suitable results (87.6% for the material and 80.4% for the media). In the dissemination stage, the modules were disseminated to schools in Palangka Raya City, East

Kotawaringin Regency, and Kapuas Regency.

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