

Ethnoconstructivism-Based E-module: Design, Implementation, and Contextualization of Local Wisdom-Based Procedural Text Learning in Elementary Schools

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Received: 06 February 2025

Accepted: 17 February 2025

Published: 18 April 2025

Abstract: Ethnoconstructivism E-module: Design, Implementation, and Contextualization of Local Wisdom-Based Procedural Text Learning in Elementary Schools. **Objectives:**

Limited learning resources, low learning outcomes, and skills in writing procedural texts are among the problems at SDN 04 Randublatung. This research aims to develop, test the feasibility, and evaluate the effectiveness of an ethnoconstructivism-based e-module using Flip PDF Professional, integrated with the local wisdom of Blora, in improving learning outcomes, procedural text writing skills, and their contextualization in digital era learning. **Method:** This research uses the research and development (R&D) method with the ADDIE development design. Data collection was conducted using test (pretest and a posttest) and non-test techniques (observation, interviews, questionnaires, and documentation). **Finding:** The results of this study indicate that the e-modules developed are very feasible to use with a percentage of 92,6% (material experts) and 92% (media experts). The reliability of the multiple-choice questions is 0.87 and the reliability of the essay questions is 0.756, both are declared reliable. The normality test showed a sig > 0,05, indicating normal data distribution. The t-test result showed sig. 0,000 confirms an increase in learning outcome after using e-module. The effectiveness showed with n-Gain of 61,25% (learning outcomes) and 59.07% (writing skills), both in the moderately effective category. Local wisdom, the traditional coconut milk coffee of Blora, is used as a context to explain procedural text material, making it easier for students to relate to new knowledge. **Conclusion:** With the increase in the average, the learning material in the form of a professional flip PDF-based ethnoconstructivism e-module integrated with local Blora wisdom on procedural text material is effectively used in the fourth grade of elementary school.

Keywords: e-module, Ethnokonstructivism, local wisdom, text procedures.

To cite this article:

Afifah, A. N., & Sukasih, N. (2025). Ethnoconstructivism-Based E-module: Design, Implementation, and Contextualization of Local Wisdom-Based Procedural Text Learning in Elementary Schools. *Jurnal Pendidikan Progresif*, 15(1), 331-346. doi: 10.23960/jpp.v15i1.pp331-346.

■ INTRODUCTION

Increasing knowledge and technological advancements have become a significant concern in achieving quality education (Donkoh et al., 2022). Quality education encompasses various aspects, such as learning resources, learning programs, teaching methods, technology integration, teacher professionalism, and

teachers' and students' perspectives on assessment (Thangeda et al., 2016). Quality education demands continuous improvement through systematic and collective evaluation and refinement of systems, practices, and the culture of educational institutions to meet the needs of students and stakeholders (Krooi et al., 2024). In psychology, learning is defined as a process of

change that indicates the subject has understood and can apply the knowledge taught (Donkoh et al., 2022). Therefore, quality education must be realised by an approach that places students at the center of learning, no longer merely as passive recipients of information (Ibrahim, 2016).

The role of teachers becomes crucial in creating meaningful learning experiences (Timm & Barth, 2021). Teachers must use effective methods to increase student interest and engagement in learning, especially by integrating contextual approaches relevant to real life (T. Wahyuni et al., 2018). Understanding the characteristics of students from various physical, moral, social, cultural, emotional, and intellectual aspects serves as a foundation for teachers in designing adaptive learning (Asrial et al., 2019). In addition, competence in curriculum development that integrates cultural values and local wisdom has also become an urgent need so that students can recognize, appreciate, and preserve the culture around them (Affandi & Tantra, 2022). This approach enriches the learning process and strengthens student's identities in social and cultural contexts (Syahrial et al., 2019).

Applying cultural values in education is essential in strengthening intercultural understanding, instilling a sense of tolerance, and preserving cultural identity and heritage (Judijanto et al., 2024). By introducing various traditions and perspectives and emphasizing the importance of cultural preservation, education not only enriches students' knowledge but also fosters respect and pride for cultural diversity amidst the tide of globalization (Wahyuni & Tandon, 2024). Education based on local wisdom becomes an essential instrument in preparing a generation that is adaptive to global changes without losing cultural identity (Lyesmaya et al., 2020).

In the digital era, technology has become an inseparable element of education (Bansal, 2016; Kainama & Latuserimala, 2022). Technology provides opportunities to enhance

learning effectiveness through more interactive learning media, such as audio-visuals, videos, or digital applications (Shaikh, 2025). Research shows that technology significantly boosts students' interest and motivation, encouraging active participation in classroom activities and making learning more engaging and impactful (Shaikh, 2025). However, the success of technology implementation highly depends on teachers readiness to adopt and utilize digital devices, such as laptops, smartphones, and other supporting software (Juliana et al., 2024; Ningrum et al., 2022). Mastery of technology has become one of the indicators of teacher professionalism that is relevant to the needs of the 21st Century (Sidiq et al., 2021). Technology integration in education must be designed strategically (Bati & Workneh, 2021; Wang & Kabilan, 2024) so that it serves as an aid and a means to enrich the learning experience, facilitate collaboration, and develop critical thinking and problem-solving skills (Tressyalina et al., 2021). The combination of technology and local wisdom in the curriculum can create a more adaptive, contextual, and value-based learning system (Salmia et al., 2024), so that students are proficient in academic aspects and possess a strong cultural identity and readiness to face global challenges.

The constructivist approach becomes important in building active and meaningful learning experiences (Yassin et al., 2019). This approach positions students as active subjects in constructing knowledge through interactions with the environment, peers, and teachers. In this framework, learning facilitates exploration, problem-solving, and reflection so that students can integrate new knowledge with their existing knowledge (Puspitasari & Ary, 2024). The constructivist approach also provides space for students to develop cognitive, affective, and psychomotor competencies in a balanced manner, which is crucial in facing the challenges of a dynamic and complex world (Carlson, 2019).

However, various problems are still found in implementing learning in Indonesia, especially in teaching the Indonesian language in elementary schools. This research identifies teaching procedural text material issues in the fourth grade at SDN 04 Randublatung, Blora, Central Java. Observations and interviews show that students' learning outcomes are still low, the use of learning media is less engaging, and learning resources are limited to students worksheet (LKS) books that lack depth. The dominant lecture method is also challenging, as it fails to enhance students' enthusiasm for understanding the material (Hidayah, 2021). Student's difficulties in writing procedural texts, such as organizing systematic steps and using correct grammar, further emphasize the need for innovation in teaching materials (Gendroyono, 2021).

All four language skills reading, writing, speaking and listening are essential and always taught with the help of technology (Shaikh, 2025). The lack of technology-based teaching materials is one of the factors affecting the low quality of learning (Wollscheid et al., 2016). Research shows learning materials based on local wisdom can improve students' writing skills in Indonesian language learning (Ramdhani et al., 2024). Syahril et al., (2019) found that ethnoconstructivism-based e-modules effectively increase students motivation and interest in learning. The findings of Kumalasari et al., (2023), show that local wisdom-based e-modules improve student learning outcomes with significant N-Gain values. This e-module supports cognitive learning and integrates cultural values relevant to students' lives, such as the local traditions of Blora. This shows that integrating technology into teaching materials has become an urgent need in efforts to improve education quality in the digitalisation era (Ramdhani et al., 2024). Interactive e-modules allow students to involve the senses of hearing and sight. The more senses that are used to receive information, the more

likely the information is remembered and understood (Sidiq et al., 2021).

In the current educational context, the integration of local culture in technology-based learning still faces significant challenges (Wulandari et al., 2022). The available learning resources tend to overlook the local cultural context, resulting in students having limitations in deeply understanding their cultural heritage (Ramdhani et al., 2024). Moreover, although literacy, particularly in the skill of writing procedural texts, is an important aspect of language learning, research on effective strategies to improve this skill is still limited (Sukadari et al., 2023).

The implementation of technology in learning is also not yet optimal (Bati & Workneh, 2021), especially in the context of integrating local culture. The use of technology is often general and non-contextual (Ermiana et al., 2024). Thus, it has not yet been able to provide meaningful and relevant learning experiences for students (Bati & Workneh, 2021). However, technology has great potential as an environmental-based learning aid that can enhance student engagement in understanding the material (Rahma Febriani et al., 2020).

Research that explicitly develops and measures the effectiveness of ethnoconstructivism-based e-modules in procedural text learning is still rarely found. Furthermore, culturally-based learning models that can be replicated in various regions are still limited. This hinders educational innovation based on local wisdom due to the lack of guidelines that can be used by educators in various regions with different cultural characteristics (Tressyalina et al., 2021). Furthermore, the preservation of culture through education has not yet been optimally integrated into the curriculum, resulting in the opportunities to instill cultural values in the learning process not being maximally utilized (Salmia et al., 2024).

This research aims to bridge the gap by developing and evaluating an ethnoconstructivism-

based e-module that integrates Blora's local wisdom into procedural text learning. Designed to enhance students' structural and systematic understanding of procedural texts, this e-module also strengthens the connection between language learning and cultural preservation (Sagala et al., 2024). Additionally, it seeks to create an adaptive learning model that can be replicated in various educational contexts based on local culture (Shaikh, 2025).

The ethnoconstructivist approach addresses learning limitations by incorporating local cultural elements into technology-based education, fostering meaningful learning experiences that connect new knowledge with students' familiar values and cultural practices (Ermiana et al., 2024). In Indonesian language learning, integrating ethnoconstructivism-based e-modules enhances students' comprehension of procedural texts by linking teaching materials with relevant cultural contexts (Misriani et al., 2023). This study seeks: (1) Analyze how ethnoconstructivism-based e-modules can improve learning outcomes and procedural text-writing skills. (2) Identify the challenges and opportunities in integrating local wisdom into procedural text learning. (3) Assess the effectiveness of ethnoconstructivism-based e-modules in elementary school learning.

■ **METHOD**

Participants

This research focuses on the fourth-grade students of SDN 04 Randublatung, with an extension of the sample to SDN Wulung 4 to address the limitation in the number of students. SDN Wulung 4 was chosen because it has similar characteristics, such as curriculum, socio-economic background, and teaching methods, so the research results remain relevant to the initial focus. The research sample consists of 36 students, with 19 students from SDN 04 Randublatung and 17 students from SDN Wulung 4. The characteristics of the respondents include

variations in academic ability, level of understanding of the material, and response to teaching methods. Data from both schools were analyzed in aggregate without differentiating the results based on the school of origin. The students were divided into small groups of 6 students and large groups of 30 students. This research was conducted in the even semester of the 2024/2025 academic year.

Research Design and Procedures

This research uses the R&D (research and development) method. To obtain specific product results, a needs analysis research is used to test the effectiveness of the product so that it can function in the broader community (Sugiyono, 2019). The development model that will be applied in this research is the ADDIE model. According to (Branch, 2009), the ADDIE development model is carried out through five steps: Analyze, Design, Develop, Implement, and Evaluate.

The research procedure follows the stages of the ADDIE model. The first stage is the analysis of problems and potential, conducted through interviews and observations with teachers and fourth-grade students at SDN 04 Randublatung which was conducted in two learning sessions that lasted 70 minutes. The criteria for selecting students are based on active engagement in learning and the diversity of levels of understanding of the concepts being studied. Data is recorded using observation sheets that include indicators of concentration, participation, interaction, material understanding, independence, and interest in learning. In addition, the observation results are recorded in the form of field notes and analyzed qualitatively to identify emerging patterns. Based on the analysis, a prototype was developed to address identified problems and potentials. It was then refined into an initial product, tested for feasibility, and implemented with 36 students using a one-group pretest-posttest design to assess effectiveness.

The final stage involves evaluating the product for suitability, sustainability, and quality improvement.

Instrument

The instruments used in this study include non-test instruments include observation and interview instruments, teacher and student needs questionnaires, expert feasibility validation questionnaires, student worksheets, and teacher and student response questionnaires and test instruments include pretests and posttests, which encompass cognitive learning outcome tests and procedural text writing skill tests. The material feasibility aspects consist of indicators: the completeness of components, material relevance, material presentation, stimuli, appropriateness of the approach used, and the language used. Meanwhile, the media feasibility consists of indicators: font usage and size, layout and arrangement, illustrations, and display design.

The test instruments are given to students individually to assess their writing skills and learning outcome in procedural texts. The cognitive learning outcome test included 30 multiple-choice questions, with 25 valid and 5 invalid after validation at the 5% level. The reliability result was 0.87, confirming the instrument's reliability. Multiple-choice questions covered understanding, characteristics, types, structure analysis, and evaluation of procedural texts. Essay questions required students to compose procedural texts based on Blora's local wisdom, evaluated on text structure, imperative words, effective language, and title relevance. The rubric validation showed item validity item 1 at 0.684, item 2 at 0.726, item 3 at 0.796, and item 4 at 0.831, with a reliability score of 0.756 at a 5% significance level, confirming its reliability.

Data Analysis

The data analysis used is initial data analysis and final data analysis. The initial data analysis was conducted descriptively, including analysing

needs questionnaires, feasibility tests by expert validators, and response questionnaires from teachers and students. The needs assessment questionnaires for teachers and students help develop the e-module product based on the ethnoconstructivism approach using Flip PDF Professional, integrated with local wisdom. The results of the analysis of the needs of teachers and students include modules integrated with technology, the use of colours and images that are attractive and contextual to students' lives, content linked to the local wisdom typical of Blora, and the language used in Indonesian. A One Group Pretest-Posttest design was used to measure the impact of the intervention using the ethnoconstructivism e-module based on Flip PDF Professional integrated with the local wisdom of Blora. The sample is given a pretest first, then treated, and finally given a posttest.

The final data test was conducted through a normality test, Paired Sample T-test, and N-gain test. The normality test was used to determine whether the data were normally distributed. The Paired Sample T-test was used to analyze the differences between pretest and posttest scores. The N-gain test was used to measure the effectiveness of the learning process by analyzing the improvement in students' scores from pretest to posttest. Additionally, the scores obtained from the pretest and posttest were analyzed descriptively by calculating the percentage of student learning mastery.

■ RESULT AND DISCUSSION

Design and Implementation of Ethnoconstructivism E-Module Based on Local Wisdom of Blora

Analysis Stage

The researcher conducted an initial study in the fourth grade of SDN 04 Randublatung through interviews, observations, and questionnaires to identify learning needs. The results of interviews with teachers and students indicate that students' learning outcomes on

procedural text material are still low, and students have difficulty composing procedural texts due to the limited reading materials used by students, namely LKS, which only contain a small amount

of material on procedural texts. In addition, the exercises in the LKS are limited to following procedures, which do not emphasize the development of skills in writing procedural texts.

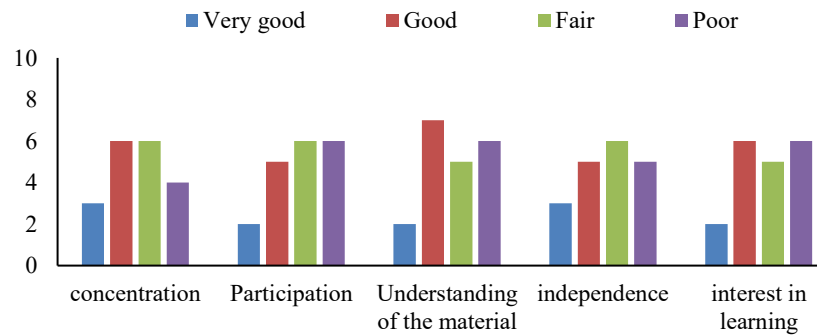


Figure 1. Observation result analisis

The results of the initial observation show that the majority of students are quite engaged in learning. However, there is still room for improvement, especially in enhancing material comprehension and students' interest in learning.

Based on survey data, both teachers and students need more focused and in-depth teaching materials to help students understand and compose procedural texts. Teachers also emphasize the need for teaching materials to motivate students, present contextual examples, and actively engage students in learning. As a solution, the researchers designed a product in the form of an e-module created using Flip PDF Professional software. This e-module integrates a constructivist approach based on the local wisdom of the Blora region, presents broader and more in-depth material, provides various examples of procedural texts, and offers exercises to improve students' writing skills. The development of this product also takes into account the availability of resources, including simple technological devices available at schools.

Design Stage

Based on the analysis, the researcher designed a prototype of teaching materials in the form of an ethnoconstructivism-based e-module that integrates the local wisdom of Blora. The initial step is to determine specific learning

objectives to meet the needs of teachers and students, namely to improve learning outcomes and the ability to write procedural texts. The design phase includes determining the material, learning activities, supporting media, and creating a wireframe of the ethnoconstructivism-based e-module to ensure a systematic and easily understandable structure.

Develop Stage

At the development stage, researchers prepare teaching materials by developing content according to the plan. E-modules based on ethnoconstructivism began to be created by integrating text, images, audio, and video, focusing on procedural text materials based on local wisdom, such as Blora coconut coffee. The initial design used Canva with A5 paper size, then exported to PDF and processed with Flip PDF Professional. The development includes additional features such as the application logo, table of contents, navigation buttons, zoom, image and video pop-ups, and interactive quizzes. The final result is exported in exe and HTML formats for easy use without the internet.

The results of developing the ethnoconstructivism e-module based on Flip PDF Professional are as follows https://drive.google.com/file/d/1xzR8wxnK5AG537oxmO9lpMe1L_9dNemW/view?usp=drive_link

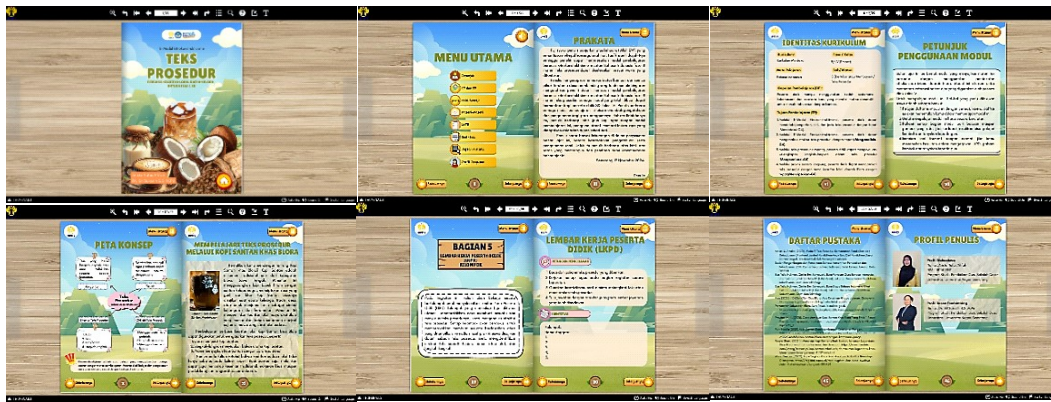


Figure 2. Results of the development of ethno-constructivism e-module based on professional flip PDF integrated with local wisdom

After the initial version of the ethnoconstructivism-based e-module was completed, the researchers conducted a validation test. Validation is conducted to identify and correct technical and content errors.

Table 1. result of expert validation

Validator Type	Result of Validation	Criteria
Material expert	92.6%	Very Feasible
Media expert	92%	Very Feasible

Based on table 1, material expert validation reached 92.6% with a very feasible category. Then, media expert validation reached 92%, with a very feasible category. The result of validation by material and media experts shows that the ethnoconstructivism-based e-module using Flip PDF Professional, integrated with local wisdom, is very suitable for procedural text learning.

Initial testing was conducted on six students of various achievement levels with pretest, LKPD, evaluation, and posttest related to procedural texts. The test results were analyzed to assess understanding, learning suitability, and the effectiveness of the ethnoconstructivism e-module in improving learning outcomes and

writing skills. Student feedback is used to refine the e-module before it is widely implemented.

Implementation Stage

Large group trials aim to ensure that a larger target audience can effectively use the media or learning product, evaluate its success in a more realistic context, and observe its impact on learning outcomes (Ellianawati et al., 2024). Over three sessions, the ethnoconstructivism-based e-module was implemented on local wisdom for procedural text material in the fourth-grade class. The meetings were designed as follows: the first meeting consisted of a pretest, the second meeting included the learning process using the local wisdom-based ethnoconstructivism e-module, LKPD, and evaluation, and the third meeting consisted of a posttest.

Evaluation Stage

The evaluation stage aims to assess the effectiveness of the Blora local wisdom-based Flip PDF e-module in achieving learning objectives. Achievements are assessed through learning outcome tests and procedural text writing skills. Feedback from teachers and students was collected through questionnaires and then analyzed descriptively. The evaluation results serve as the basis for refining the e-module to

make it more relevant and enhance student understanding.

The effectiveness of the ethnoconstructivism e-module based on Flip PDF Professional integrated with the local wisdom of Blora

To identify the effectiveness of the ethnoconstructivism e-module based on the local wisdom of Blora using Flip PDF Professional, the obtained data were analyzed using the normality test, t-test, and N-gain test. The results of the normality are presented in the table below.

Based on Table 2, show that the learning outcomes pretest and posttest both have a significance value of 0.505. For procedural text writing skills, the pretest has a significance value of 0.466, and the posttest is 0.820. The data are normally distributed.

The paired sample t-test analyses significant differences in learning outcomes and procedural text-writing skills before and after the treatment. The test results are presented in the following table:

Table 2. Normality test result for small group learning

Aspect	Test Type	Sig. Saphiro Wilk	Criteria
Learning Outcomes	Pretest	0.505	Normally distributed
	Posttest	0.505	Normally distributed
Skills in writing procedural texts	Pretest	0.466	Normally distributed
	Posttest	0.820	Normally distributed

Table 3. Paired sample t-test results of small group learning

Aspect	Test Type	Sig. (2-tailed)	Criteria
Learning Outcomes	Pretest-Posttest	0.001	There is a significant difference.
Skills in writing procedural texts	Pretest-Posttest	0.006	There is a significant difference.

Table 3 shows a significant difference between pretest and posttest scores. The learning outcomes of procedural texts have a sig. (2-tailed) value of 0.001, while procedural text writing skills have a value of 0.006, both indicating significant improvement. This confirms that the ethnoconstructivism-based e-module using Flip PDF Professional with Blora’s local wisdom effectively enhances students’ learning outcomes

and writing skills. This aligns with the research Ermiana et al., (2024), which found a significant difference between the pretest and posttest using media-oriented towards local wisdom.

The analysis of the effectiveness of using the ethnoconstructivism e-module based on Flip PDF Professional integrated with local wisdom from Blora was conducted using the N-gain test with the result bellow:

Table 4. N-Gain test result of small group learning

Aspect	Average Pretest	Average posttest	Average different	Max. Score	N-Gain		Criteria
					Score	(%)	
Learning Outcomes	66.67	86.67	20	100	0.617	61.7	Quite effective
Writing skills procedural texts	62.5	84.37	21.87	100	0.563	56.3	Quite effective

Table 4 shows that the learning outcomes obtained an N-gain score of 0.617 in the quite effective category. The skill of writing procedural texts obtained an N-gain score of 0.563 in the quite effective category. Based on the N-gain scores in the small group, the ethnoconstructivism e-module based on Flip PDF Professional is quite effective in improving learning outcomes and

procedural text writing skills. This aligns with the research Kumalasari et al., (2023), has a significant influence on students' learning outcomes.

Next, the product is tested on a larger group was tested using the same test as the small group test. Here are the results of the normality test for the large group:

Table 5. Normality test result for large group learning

Aspect	Test Type	Sig. Saphiro Wilk	Criteria
Learning Outcomes	Pretest	0.113	Normally distributed
	Posttest	0.079	Normally distributed
Skills in writing procedural texts	Pretest	0.153	Normally distributed
	Posttest	0.096	Normally distributed

Table 5 shows that in the learning outcomes aspect, the pretest has a significance value of 0.113 and the posttest 0.079, indicating normal distribution. Similarly, for procedural text writing skills, the pretest has a significance value of 0.153 and the posttest 0.096, confirming that the data are normally distributed.

The results of the paired sample t-test can be seen in the table below.

Table 6 shows that the paired sample t-test indicates a significant difference between pretest and posttest scores. The sig. (2-tailed) value of 0.000 for both learning outcomes and procedural text writing skills confirms that the

Table 6. Paired sample t-test results for large group learning

Aspect	Test Type	Sig. (2-tailed)	Criteria
Learning Outcomes	Pretest_posttest	0.000	There is a significant difference.
Skills in writing procedural texts	Pretest-Posttest	0.000	There is a significant difference.

ethnoconstructivism-based e-module using Flip PDF Professional with Blora's local wisdom effectively improves both aspects. These findings align with the research by (Fatimah et al., 2023),

which indicating a difference in learning outcomes before and after the use of the interactive e-module. The N-gain results are presented in the table below.

Table 7. N-Gain test of large group learning outcomes

Aspect	Average Pretest	Average posttest	Average different	Max. Score	N-Gain		Criteria
					Score	(%)	
Learning Outcomes	62.53	84.93	22.40	100	0.6125	61.25	Quite effective
Writing skills procedural texts	61.04	85.83	24.79	100	0.5907	59.07	Quite effective

Table 7 shows that the learning outcomes obtained an N-gain score of 61.25% in the quite effective category. The skill of writing procedural texts obtained N-gain score of 59.07% in the quite effective category. Based on the N-Gain score, the ethnoconstructivism-based e-module using Flip PDF Professional is quite effective in improving the learning outcomes and procedural text-writing skills. This result is supported by research Asmah et al., (2022), which shows that

local wisdom-based e-modules supported by flipbook applications can improve student learning outcomes with an effectiveness percentage of 84.08%.

The results of the response questionnaire from teachers and students are presented in the following figure:

Figure 3 shows the results of analysing the teacher and student response questionnaire to the e-module. Average teacher rating of 98.8% in

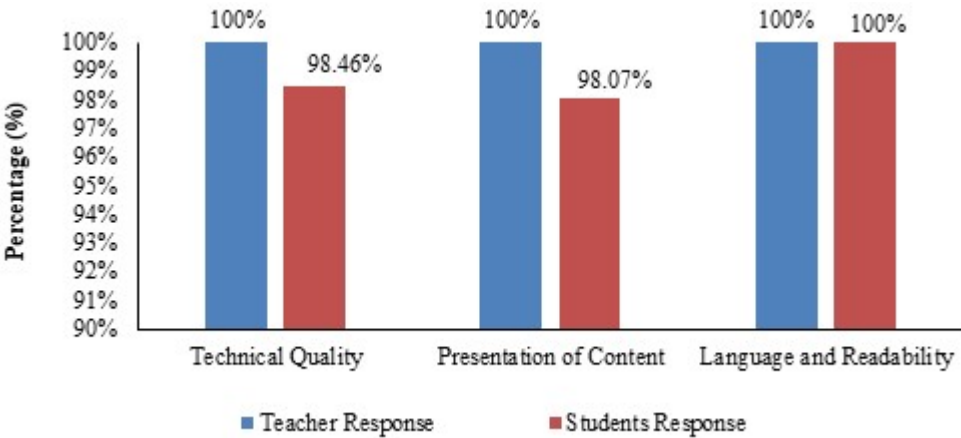


Figure 3. Teacher and student responses

the very feasible category. An average student rating of 98.8% as very feasible category. The average score of the students' assessment falls into the very feasible category.

Contextualization of ethnoconstructivism-based e-module learning using Flip PDF Professional integrated with local wisdom of Blora

Local wisdom of Blora, such as coconut coffee is integrated as a learning context. This provides a learning experience close to the student's daily lives, especially in learning procedural texts. Students are invited to practice making coconut milk coffee. Next, the students were asked to write a procedural text based on their experiences. This approach allows students to directly understand the concept of procedural texts while also strengthening the connection between the learning material and local culture. Through this process, learning becomes more

meaningful because students not only read theory but also experience and reflect on the procedural stages they perform themselves (Sarnoko., et al 2024).

Through the ethnoconstructivist approach, students are invited to build new knowledge based on their experiences and culture so that learning is not only cognitive but also emotional and social (Ermiana et al., 2024). This e-module is a strategic innovation combining modern technology with preserving traditional culture (Alwi et al., 2024). With an effective and efficient design, this e-module becomes a sustainable and meaningful learning tool, supporting education relevant to students' needs while strengthening their cultural identity.

Discussion

This research shows that the Blora local wisdom-based e-module effectively improves students' understanding of procedural texts, as

reflected in the significant increase in pretest and posttest scores which can be seen in the following table.

The improvement in learning outcomes and writing skills before and after using an ethnoconstructivism-based e-module, based on

Table 8. Comparison of learning outcomes before and after the use of the E-Module

Group	Aspect	\bar{x} Pretest	Std. dev	\bar{x} Posttest	Std. dev	improvement
Small Group	Learning outcomes	66.67	13.064	86.67	5.514	61.7%
	Writing skills	62.5	11.858	84.37	6.555	56.3%
Large Group	Learning outcomes	62.53	12.136	84.93	7.254	61.25%
	Writing skills	61.04	12.89	85.83	8.358	59.07%

n-gain results, shows that the integration of local wisdom in learning provides a context closer to students' lives, making it easier for them to understand and apply the concept of procedural texts. These findings align with the research results of (Ramdhani et al., 2024), where the use of locally-based teaching materials positively impacts the quality of learning, such as improving concentration and interest, as well as creating a conducive learning environment. The research by Tressyalina et al., (2021) reinforces the findings of this study that implementing local

wisdom in interactive e-books can help students understand texts more easily because local wisdom is very close to the students' lives. Supiatman et al., (2023) further strengthen that learning by internalizing cultural values makes it easier for students to understand and improve learning outcomes because it is relevant to the environment and learning context. Learning that is relevant to the local context has been proven effective in facilitating more engaging and meaningful learning for students (Ramdhani et al., 2024).

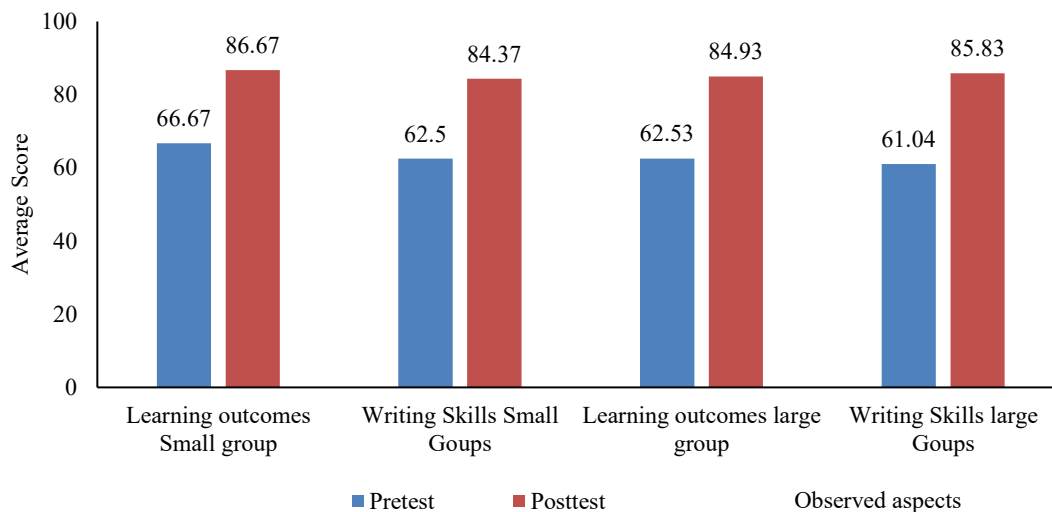


Figure 4. improvement in learning outcomes and writing skills

Figure 4 confirms that the improvement in learning outcomes and procedural text writing skills occurs consistently on a small and large scale, indicating that the effectiveness of this e-module does not depend on class size. This is

further reinforced by social constructivism theory, which emphasizes that learning in a relevant cultural context can enhance students' cognitive and affective engagement, positively impacting their learning outcomes (Hassan, 2023).

Additionally, the research findings (Asrial et al., 2019) explain that this improvement is supported by the ethnoconstructivism approach, which emphasizes the importance of local cultural context in learning. This is supported by Rumble et al., (2018), who state that students who learn in a familiar environment are more emotionally and cognitively engaged, enhancing their understanding. (Sagala et al., 2024) reaffirm the findings of this study, stating that incorporating local wisdom into the education curriculum can create immersive learning experiences, instill a sense of cultural ownership, promote holistic education, and foster a deeper appreciation for cultural diversity and heritage. Contrary to the findings, although constructivism is capable of improving student learning outcomes, more intense interaction between students and teachers, as well as the availability of adequate resources, remain crucial factors in maximizing the benefits of constructivism in learning (Ugwuzor, 2020).

Implementing this e-module also received positive feedback from teachers, who felt that this e-module made teaching easier despite facing challenges such as limited access to technology and the time required to adapt the material to existing local wisdom. This research aligns with (Elihami et al., 2024) that the challenges faced in terms of technology reflect the fundamental phenomenon of limited access to educational resources, which remains an issue in several areas. This challenge is reinforced by (Syahrial et al., 2020), who highlights that many teachers have been unable to optimally implement ethnoconstructivist-based learning due to a lack of understanding and pedagogical competence. As a result, students' cultural backgrounds have not been fully integrated into the learning process. The difficulties teachers face in integrating local wisdom into learning are supported by research (Jingga & Sujadi, 2020) that shows teachers recognize the importance of integrating knowledge and local wisdom in mathematics, but

their understanding and application are still limited. The lack of knowledge about local wisdom becomes the main obstacle, making integration with science even more difficult. Moreover, the lack of cross-disciplinary discussions highlights the need to focus on integration subjects. However, (Kainama & Latuserimala, 2022) found that teachers who are accustomed to technology more easily accept e-modules as innovative learning media.

Observation of implementing the ethnoconstructivism e-module shows that integrating local wisdom in learning increases student engagement. Students were more enthusiastic in discussions, practices, and culture-based tasks, such as composing procedural texts for making Blora's signature coconut milk coffee. These findings align with the socio-cultural motivation theory, which states that culture-based learning can enhance students' sense of belonging and engagement (Hassan, 2023). These findings are also supported by the research of (Syahrial et al., 2021), which shows that the use of ethnoconstructivism learning modules in education enhances students' conceptual understanding and critical thinking skills. Moreover, in line with (Harefa, 2024), integrating culture into learning enhances conceptual understanding and learning motivation and strengthens students' connections with their social environment.

The results of this study affirm that ethnoconstructivism-based e-modules are an effective and relevant learning innovation, not only improving learning outcomes but also instilling local cultural values. With continuous development, this e-module can become an integral part of technology and culture-based education in Indonesia.

■ CONCLUSION

The ethnoconstructivism e-module based on Flip PDF Professional with local wisdom from Blora is an effective and relevant learning innovation. This module connects the material with

local culture, making learning more meaningful and supporting cultural preservation. The challenges faced in the implementation of ethnoconstructivism-based e-modules such as limited access to technology and the time required to adapt the materials to existing local wisdom. The normality test showed a $\text{sig} > 0,05$, indicating normal data distribution. The t-test result showed $\text{sig. } 0,000$ confirms an increase in learning outcome after using e-module. The trial showed an improvement in learning outcomes and procedural text writing skills, with an N-Gain of 61.25% in the learning outcomes aspect and 59.07% in the writing skills aspect, both categorized as quite effective. The responses from teachers and students were also very positive, with an average teacher rating of 100% in the very feasible category and an average student rating of 98.8%. Thus, this e-module becomes an innovative and sustainable solution for learning Indonesian language procedural text material.

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