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Development of Project-Based E-Instruments Assisted by Digital Learning Platforms to Enhance Student Creativity in Indonesian Language Lessons

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A B S T R A C T

The creativity crisis among elementary school students, especially in the upper grades, has become a serious problem in education. If not addressed immediately, this problem can hamper students' competitiveness before they fully develop their potential. Creativity refers to the ability to generate new ideas and find solutions to any problem. However, many students still struggle with decision-making and innovation. Departing from this problem, this study aims to develop an e-based instrument to enhance student creativity. This e-instrument integrates various learning supports, including teaching modules, worksheets, creativity assessment instruments, and interactive quizzes. This instrument is designed according to the syntax of the Project-Based Learning (PjBL) model and aligns with creativity indicators, enabling students to complete projects without relying on stationery. This study uses the Research and Development (R&D) method with the Nieveen model, which consists of preliminary research, prototyping, summative evaluation, and Systematic Reflection and Documentation Stage. The results show that the e-instrument achieves a high level of validity with an average score of 0.80 (valid category). Its practicality reached 93.41% from teachers and 81.39% from students (both very practical). The N-gain score was 0.61 (moderate). Therefore, the developed E-instrument is valid, practical, and effective in improving student creativity.

1. Introduction

Education plays an important role in preparing generations for the 21st century that requires critical, creative, communicative, and collaborative thinking (Mahmudah et al., 2024; Susiloningsih et al., 2022). These four competencies must be optimally promoted at every level of education and learning, especially in elementary school, which serves as a special stepping stone and the first stage for students to begin building their character and abilities. Among all the competencies used strategically to face global challenges, creativity is one. Creativity is related to a person's ability

to generate new ideas, find solutions, and create innovations that meet the needs of the times (Al-Zahra & Handayani, 2025). Basically, creativity is the process of generating ideas as well as solving problems (Pianda & Rahmiati, 2020). Creativity is necessary because everyone has to adapt to rapid and complex changes in the midst of the emergence of the industrial revolution 4.0. Rassanjani et al. (2021) note that creativity is the basic foundation of innovation in terms of novelty, namely new ideas, methods, or approaches to the work process. Therefore, creativity is not only the ability to think, but also the competence to produce valuable and useful outputs. Low learning participation occurs due to students' creativity that cannot be improved, limited critical thinking skills, and challenges in concept development or problem solving (Tiana & Wahyuni, 2025).

However, in the field, it was observed that students had a low level of creativity. The results of observations in grade IV at SDN 21 Tolomundu Bima City show that students are still not able to come up with new ideas, are less willing to try different things, and are not able to produce original works. The results on the creativity test were categorized as low, with a percentage of 45.99%. This situation becomes even more serious considering that most of the learning process is still traditional and teacher-centered, so that students only become recipients of knowledge with fewer opportunities to test their own ideas. In addition, another factor that hinders students' creativity is the use of assessment instruments that are still conventional. Commonly used instruments are student worksheets (LKPD), written tests, and essay questions that do not provide adequate opportunities to invite more in-depth exploration of ideas. Similarly, the assessments carried out are often subjective and have not made optimal use of digital technology. This condition is in line with the research of Fajira et al. (2025) which states that learning instruments are too lacking in innovation so that students' creativity is hardly improved. Therefore, learning aids need to be made more innovative, more interactive, and adaptive as technology continues to evolve.

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One alternative that can be used to overcome these problems is to develop project-based E-instruments assisted by digital learning platforms. E-instruments are digital-based assessment tools designed to measure learning processes and outcomes more effectively and attractively so that they can increase students' creativity. The use of E-instruments allows students to be more active in the learning process and provide a more interactive learning experience. In order for the implementation of E-instruments to be more optimal, appropriate learning models are needed, one of which is the project-based learning (PjBL) model. The PjBL model emphasizes learning through projects that are relevant to real life so that it is able to improve critical thinking, collaboration, and problem-solving skills (Safina et al., 2026). Several previous studies have shown that the application of the PjBL model is able to increase students' creativity in learning (Oktaviani et al., 2025). In addition, the use of digital learning platforms has also been proven to improve the quality of learning through the provision of flexible and interactive learning resources (Fatimah et al., 2026). In line with this, Atsalisa et al. (2025) argue that the quality of learning from digital platforms can also increase creativity so that it can encourage students' abilities. Canva and wordwall are one of the learning platforms that teachers can use to develop more interesting and innovative

learning instruments. Canva allows teachers to design creative visual-based instruments, while Wordwall provides interactive features to create more varied and fun question forms (Asniarti et al., 2025).

However, research integrating project-based E-instruments with digital learning platforms in the context of Indonesian language lessons in elementary schools is still limited. Most previous research has focused only on the use of learning models or media separately, without developing digital assessment instruments that are integrated with project approaches. Therefore, in this study, the researcher contributed to developing project-based E-instruments assisted by a digital learning platform that was systematically designed to enhance students' creativity. Because the products in it provide space for students to explore their ideas and ideas. Indonesian language lessons in elementary schools have an important role in developing students' language skills and creativity. Students are not only required to master listening, speaking, reading, and writing skills, but also to be able to develop ideas, express ideas, and produce creative works (Derana & Huda, 2025; Jhoni et al., 2025). In line with this, Aisah et al. (2025) stated that the success of a learning process depends on how the model applied by teachers and the media used in supporting the learning process, which is able to increase student motivation in doing assignments.

Based on the description above, the purpose of this research is to develop a project-based E-instrument assisted by a digital learning platform that is valid, practical, and effective in increasing students' creativity in Indonesian language lessons in elementary schools. With the existence of this project-based E-instrument developed, the researcher hopes that the learning goals can be achieved, so that the material delivered by the teacher after the learning process can be understood by students well. However, if what has been learned at school is not fully understood by students, they can learn and practice working on the questions independently. Because in the E-instruments that are developed, there are modules, LKPDs, test instruments, and quizzes that can be accessed by them anytime and anywhere they need.

2. Methodology

This research is a type of R&D (Research and Development) research using the Nieeven development model with development stages, namely preliminary research (literature review), prototyping stage (designing design instructions), summative evaluation (summative evaluation), and systematic reflection and documentation (writing the study). Data collection in this study was carried out through observation, tests and documentation. Tests are assessment methods designed and implemented for students at a certain time and place and under conditions that meet certain clear requirements. This research instrument used a material and media expert validation questionnaire, a student and teacher response questionnaire, and a creativity test instrument in the form of a Pre-test and Post-test with a total of 15 questions in the form of a presentation. This research was conducted at an Elementary School in Bima City, West Nusa Tenggara. The

number of students in the product practicality trial was 15 students, and for the effectiveness trial was 18 students. The following is an explanation of the 4 stages of the Nieveen model:

Preliminary Research Stage

At this stage, information was collected by conducting an interview with the homeroom teacher of grade IV, namely Mrs. N, which was related to the characteristics of students and supporting facilities during the learning process and the learning model that was applied. The number of questions is 6 questions. In this first stage, there are three aspects that are analyzed, including problem analysis, student analysis, and needs analysis.

Prototyping Stage

At this stage, the researcher designed the e-instrument development plan. This included the main and supporting products. The main products included the teaching module design, module design, student worksheet design, creativity test instrument design, and KI design. Meanwhile, the supporting products included media and material expert validation questionnaires, teacher and student response questionnaires, and creativity test instruments in the form of pre-tests and post-tests.

Summative Evaluation Stage

In this section, the researcher describes the results of the feasibility study (material and media expert validation questionnaire), practicality (student and teacher response questionnaire), and effectiveness (creativity test instrument) of the learning products developed.

Systematic Reflection and Documentation Stage

At this stage, the entire study is written to support the analysis, then the product that has been developed is registered to obtain Intellectual Property Rights (IPR), at this stage it can be done simultaneously with the previous stages.

3. Results and Discussion

Result

This research produced a project-based E-instrument assisted by a digital learning platform for grade IV elementary school students on narrative text materials, which was developed using the nieveen model and Project-Based Learning. The e-instrument was validated by subject matter experts, media experts, its practicality was tested by teachers and students, and its effectiveness was tested using a creativity test with a total of 15 number questions in the form of descriptions arranged based on creativity indicators and characteristics of grade IV students. So that this development research goes through the preliminary research stage, the

protyping stage, the summative evaluation stage and the systematic reflection and documentation stage. The following is a description of the development results at each stage of development:

Preliminary Research

Based on interviews and observations, several problems were identified among students, teachers, and learning materials. Student creativity remains low, evident in the lack of ability to express ideas, the courage to try new things, and the production of original work. For teachers, learning remains conventional and teacher-centered, with lecture and question-and-answer methods. Teachers also fail to provide students with opportunities to explore and develop ideas independently. Furthermore, the learning materials used are still predominantly printed, such as government-issued worksheets (LKPD), written tests, and repetitive practice questions.

The use of digital instruments is still very limited, and assessments of student creativity tend to be based on teacher intuition. Learning resources and media are also monotonous and less interactive. The needs analysis revealed that the teaching materials used are textbooks and worksheets, which are still in printed form. While the curriculum uses the independent learning curriculum, the teaching models and resources are still ineffective in teaching the independent learning curriculum and are less effective in enhancing student creativity. Literature analysis and previous research revealed several relevant studies, including: Research by Izzah et al. (2024) entitled web-based evaluation instruments in indonesian language lessons in elementary schools shows that the use of the quizizz application effectively improves student learning outcomes from an average of 45.7 to 86.15. Furthermore, Putri et al. (2024) entitled the development of interactive e-LKPD assisted by wizer.me on the material of my country, Indonesia, is able to improve student learning outcomes with an average N-Gain of 0.7 with high criteria.

In addition, research by Supriyadi et al. (2026) entitled integration of indonesian language learning management through digital platforms: classroom management innovation in the industrial revolution 4.0 era shows that the integration of digital platforms has great potential in learning, although it still requires system support such as teacher training and curriculum development. Based on this study, the development of project-based E-instruments assisted by digital learning platforms is considered capable of improving students' creativity, especially in narrative text material.

Prototyping Stage

The development planning for this E-instrument consists of main products and supporting products. The main products designed include: 1) teaching modules, 2) modules, 3) LKPD, 4) Pre-Test and Post-Test and, 5) quizzes in the form of multiple choice questions and word matching. The supporting products designed at this stage consist of a feasibility questionnaire in the form of a media and material expert validation questionnaire, practicality namely student and teacher response

questionnaires, and effectiveness between creative texts in the form of Pre-test and Post-test. The main product design can be seen in Figure 1.

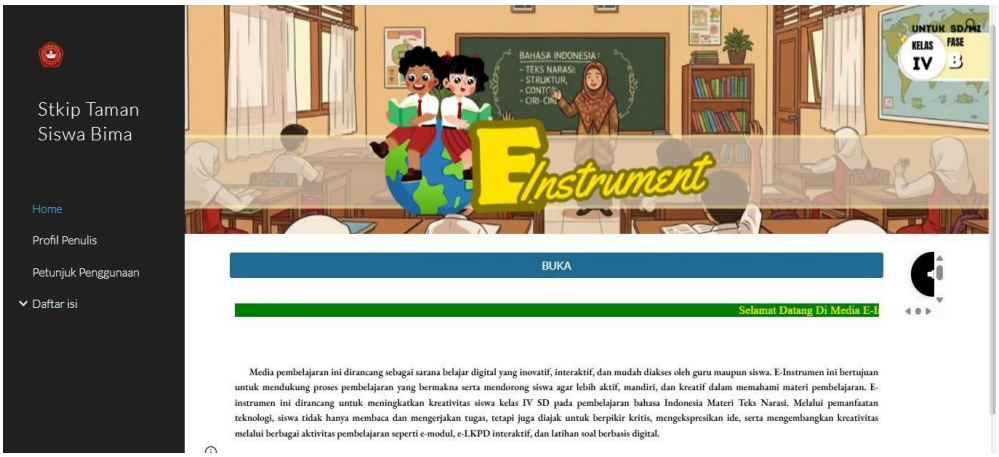

Figure 1. E-instrument Main Display

This E-instrument product contains several teaching materials in digital form that can be used by teachers and students in helping the learning process, including; Teaching modules, modules, LKPD, creativity tests, and there are quizzes. However, in the main section there is a brief description of the E-instrument developed. The following is an explanation of each product developed:

Teaching Modules

The teaching module developed in this study complies with a series of regulations and standards established by the Ministry of Culture, Research, and Technology (Kemendikbudristek). Its development was updated based on the research variables examined. In the developed teaching module, the researcher adapted the syntax of the Project-Based Learning (PjBL) model, a learning model that directly emphasizes student activeness by encouraging them to create projects in which they are more dominant (Noviati, 2021). This model is a highly innovative learning model for teachers to implement and is suitable for enhancing student creativity. The appearance of the developed teaching module is presented in Figure 2.

The teaching module above contains several contents that will be a guideline for teachers in teaching so that the learning process runs according to plan. The content of the teaching modules developed is; a) general information that includes the identity and context of the initial learning, b) Pancasila student profiles, c) facilities and infrastructure, d) core competencies, in this section there are CP, ATP, TP, criteria for achieving learning objectives, elements, and triggering questions. e) Learning activities, in this activity there were three meetings held in the first meeting, namely observing images, the second meeting planning the narrative text, and the third meeting making and presentation of the project. In this teaching module, there are also assessments or assessments, enrichment and remedial, as well as reflections for students and teachers

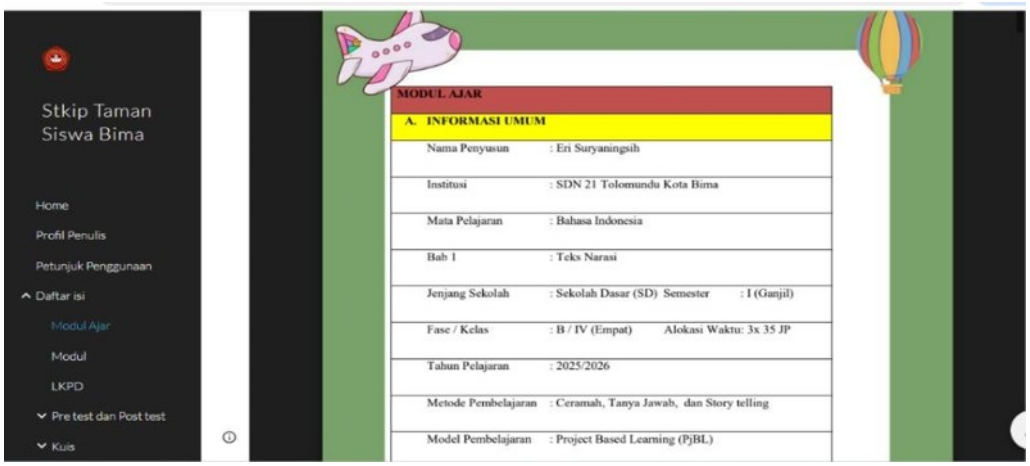

Figure 2. Teaching Module Display Design

Modules

Modules are teaching materials developed to facilitate teachers, especially students, in the independent learning process (Harahap & Fauzi, 2017). So that both students and teachers can access them at home or outside of school. As time goes by and changes become increasingly complex, students easily become bored in learning a material, so that with the existence of modules that have been developed, it can increase student learning motivation so that in the learning process, they do not use teaching materials that are only in printed form such as textbooks and LKS. This module is designed based on the PjBL model, so that students actively participate in the learning process. The appearance of the developed module is shown in Figure 3.

Figure 3. Module Cover Display

The image above is a display of the module cover that was developed, the first page is the cover, the next page contains a triggering question that encourages students to start thinking, and the next is material about narrative texts, as teaching materials for teachers and students. But in addition to that, on the final page of the module

there is a glossary that makes it easier for students to understand the terms of the words they have just heard

LKPD

According to Sarman et al. (2023) LKPD is a worksheet that students work on using digital devices systematically and continuously within a specified timeframe. The following is a display of LKPD, which can be seen in Figure 4.

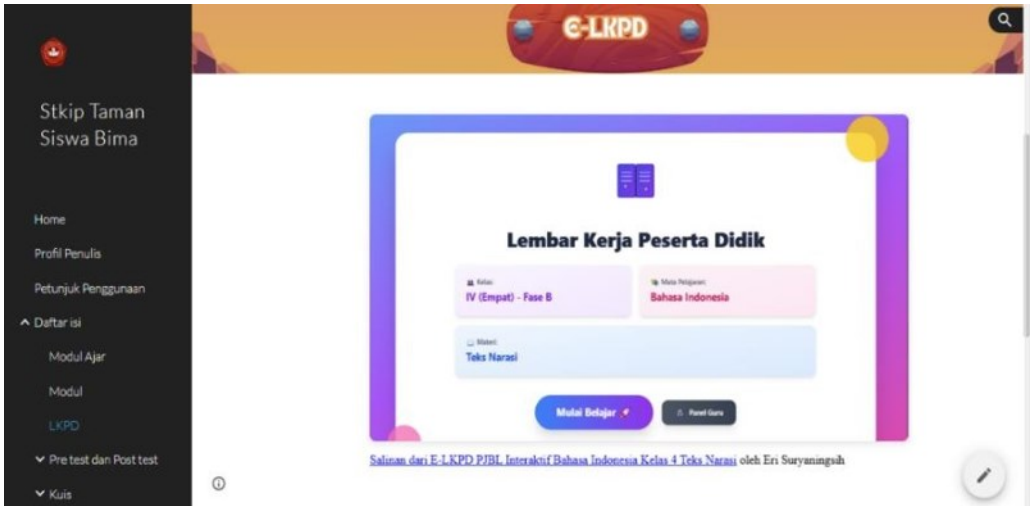

Figure 4. E-LKPD Cover Display

Some of the contents of this LKPD consist of; Cover On this cover there are two panels, namely for students and teachers. For the student panel, there are learning objectives, learning outcomes, learning objectives, learning objectives, materials, and several description questions, multiple choices, word matching and projects that will be worked on in making narrative stories that are adjusted to the PjBL syntax and guided by creativity indicators. In this section there are 7 stages including; 1) basic questions, 2) sorting pictures, 3) planning, 4) creating projects, 5) evaluating, 6) presenting, 7) reflection. Meanwhile, on the teacher's panel, every answer from students at each stage is available. In the stage of planning the project, students will be asked to fill in the columns provided, in this column students can plan the title of the narrative text story, who are the characters in it, how the time and place of the story occurs, the plot used, and the code. So that in the fourth stage, students will immediately write in their entirety and arranged in one existing filling column.

Pre-Test and Post-Test

The pre-test and post-test developed are creativity test questions 15 numbers are adjusted to 4 indicators of creativity, including: fluency, flexibility, originality, and elaboration which refers to the cognitive level of students, namely from C4-C6, in addition to that these pre-test and post-test questions are prepared based on narrative text material, taking into account the syntax of the PjBL model. Pre-test design drawings and post-test can be seen in Figures 5 and 6.

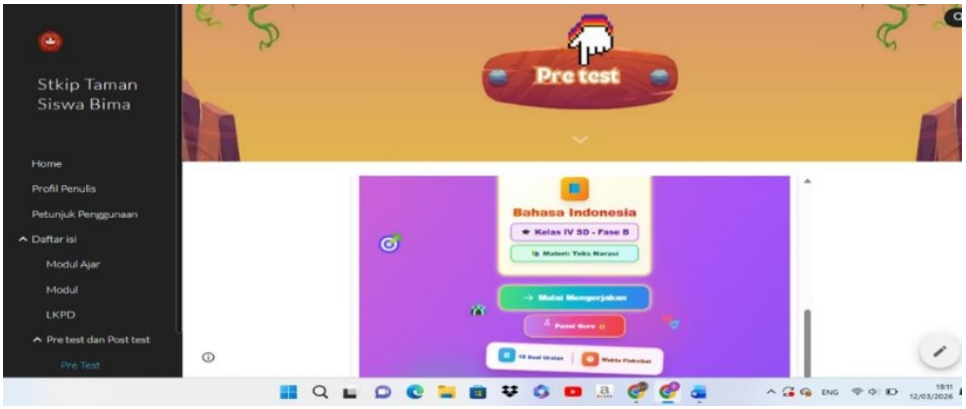

Figure 5. Pre-test product design

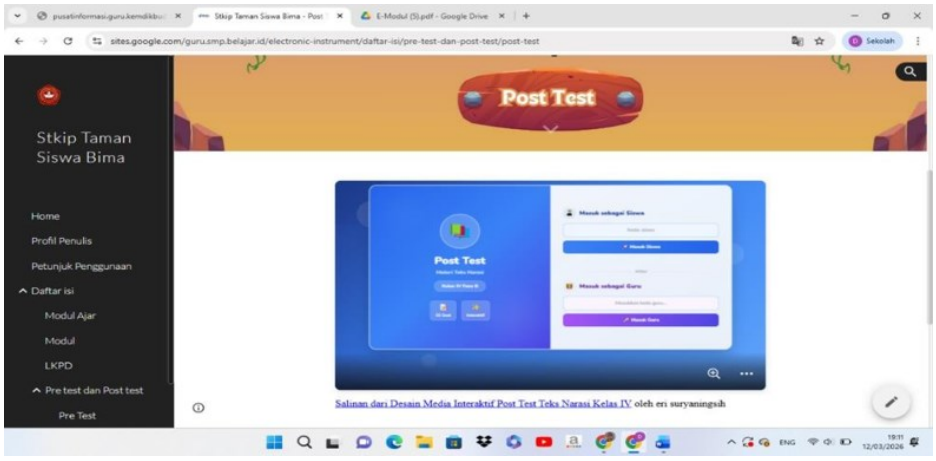

Figure 6. Post-test Product Design

The Pre-test and Post-test products have similarities with LKPD because they both have panels for students and teachers, but for the Pre-test and Post-test there are 15 creativity test questions. After students click on the top panel, they will be continued to the next page, namely, work instructions, after the sheet students will be directed to fill in their data to proceed to each question up to question No. 15. In each question, the indicators of creativity and cognitive level of students are not made in a structured manner, but are made randomly.

Quiz

A quiz is a form of game or mind exercise in which students (as individuals or in teams) attempt to answer questions correctly (Sar'an et al., 2025). The quizzes designed in this study were multiple-choice and word-matching quizzes, with questions relevant to the narrative text. The quizzes were administered after the teacher delivered the material. Therefore, although the study did not explicitly explain mindfulness, meaningfulness, and joy, it implicitly applied these three principles of in-depth learning, aiming to make learning more enjoyable and enjoyable for students. The design of the multiple-choice and word-matching quizzes can be seen in Figures 7 and 8.

Figure 7. Multiple Choice Quiz Design

Figure 8. Word Match Quiz Design

In the media (figures 7 and 8) it is made slightly different from other products, in this quiz the questions given are only a few questions, while in the LKPD and creativity test instruments there are many questions. When students want to take the quiz, they must click the start button to get them to start right away in the question. For the questions in the quiz in the form of basic questions, examples of multiple-choice questions are; 1) Narrative text is a type of text that is often used in children's storybooks. The main objectives of a narrative text are: a. explain the steps of doing something in order, b. describe the state of a place in detail, c. narrate an event or experience in sequence from beginning to end, d. present data and facts scientifically. In the question, students will be asked to click on the answer they consider correct so that they will automatically switch to the next question. It is similar to the word matching question, but what distinguishes it in this word matching question is that students will be asked to shift each word to be connected to the right word.

Summative Evaluation Stage

At this stage, the researcher outlines the results of the feasibility study, practicality, and effectiveness of the project-based E-instrument assisted by the digital learning platform developed. This section describes the results of the feasibility study, practicality and effectiveness of the developed learning tools.

The feasibility test is carried out through an assessment given by media experts and material experts on the products that have been developed, namely project-based E-instruments that have been developed by the researcher. In the E-instrument, there are teaching modules, modules, LKPD, Pre-test and Post test, as well as quizzes. In addition, a feasibility test is also carried out on the material contained in the E-instrument whether the material is in accordance with ATP, TP, and CP. The practicality of E-instruments is determined by the user, namely teachers and students. Thus, an analysis of the level of practicality is carried out on the data from the assessment of teacher responses and responses from students. Another aspect that shows the quality of the E-instruments developed in this study is the effectiveness of E-instruments when implemented in learning activities. The effectiveness was assessed using a test instrument with a total of 15 description number questions.

Expert Validation Results

The validation process is carried out by two experts, namely material experts and media experts, to determine the feasibility level of the developed product. The validation results in the analysis are based on the results of validation to the two validators, the following are the results of each validator:

Subject Matter Expert Validation Test

In the process of analyzing product validation data, the score was determined using a likert scale with five scales consisting of: not good (value 1), not good (value 2), good enough (value 3), good (4), and very good (value 5). The formula used is to use the Content validity (V) formula, as seen in Tables 1 and 2.

Table 1. Material Validation Results Data

Assessment Aspects	Content validity	Criteria
Content eligibility	0,78	Valid
Aspects of presentation eligibility	0,77	Valid
Language eligibility aspects	0,63	Valid
Project Based Aspects Learning	0,81	Very valid
Average	**0,74**	**Valid**

Based on the results of data analysis in the table above, it can be seen that the average score from the subject matter expert is 0.74. It can be said that according to the expert assessment of the material material of the product developed is declared to meet valid criteria. Several inputs and suggestions from material experts have been received by researchers as revision material to make E-instruments better.

Media Expert Validation

Based on the table above, from the assessment aspect, an average score of 0.86 was obtained, which has met the criteria, namely very valid or suitable for use without revision. Thus, overall, the score results obtained are 0.80 with a valid category, so

that the developed E-instruments are suitable for use. This is in line with previous research by Muslimah et al. (2021) which states that a product with an average score of 0.80 can be said to have good expert consideration and proven to meet valid criteria. Furthermore, the development product can be empirically tested to students to test the effectiveness and practicality of the developed product.

Table 2. Media Validation Results Data

Assessment Aspects	Content validity	Criteria
Display	0,87	Very valid
Content Aspect	0,86	Very valid
Linguistic aspects	0,87	Very valid
Average	**0,86**	**Very valid**

Practicality Test

The practicality of E-instruments is determined by the results of teacher and student responses. Analysis of the level of practicality was carried out on the data from the assessment of teacher responses and responses from students using the scoring percentage formula. The results of these responses can be seen in Tables 3 and 4.

Table 3. Practicality Data on Teacher Response Results

Aspects	Percentage gain	Remarks
ATP	92%	Very practical
Modules	95%	Very practical
Aspects of E-instruments	86.66%	Very practical
Aspects of PjBl	100%	Very practical
Quantity	**373,66%**	
Average	**93,41%**	**Very practical**

From the table above, it can be said that from the results of the teacher's assessment as a whole, the assessment aspect at each meeting has met the minimum practical criteria. The average percentage of teacher response results obtained was 93.41% with the category of very practical to use. As stated in previous research by Sulastri et al. (2025) the percentage with the acquisition of teacher responses of 81-100 can be said to be very practical so that it is easy to use in learning and suitable for application in the classroom.

Table 4. Data on the Results of Student Responses

Description	Value
Number of Students	15
Total Score	1.343%
Average	81,39%
Percentage	1.220,88%
Categories	Very Practical

Referring to the table above, the information obtained shows that the level of practicality based on student responses, both overall and in each aspect, is in the very practical category with an average score of 81.39%. This refers to the practicality criterion which states that the value range of 81%–100% is in the

category of very practical, so that the product developed is declared easy to use and suitable for application in learning and learning (Hayati & Nuriyah, 2023). Furthermore, the implementation of project-based learning E-instruments is indicated by the results of observations made by the homeroom teacher of grade IV in each implementation of learning carried out using project-based E-instruments presented in Table 5.

Table 5. Learning Implementation Results Data

Meetings	% Average
First	100%
Second	100%
Third	100%
Average	**100%**
Criteria	**Highly implemented**

The table above explains that the learning steps using project-based E-instruments showed an average percentage of 100% with the category of being very implemented. This criterion refers to the implementation category which states that the percentage of 81%–100% is included in the category of very good or very well implemented (Fitriana et al., 2023). So that the results of the learning implementation show that with project-based E-instruments assisted by digital learning platforms are carried out very well.

Effectiveness Test

The effectiveness test was analyzed from the results of a large-scale trial test using the N-gain formula and assessed according to the N-gain assessment criteria. The results of the creativity test analysis by 15 students can be seen in Table 6.

Table 6. Acquisition of N-gain from the Creativity Test

Data	Spost-spre	Smax-spre	N-gain	Categories
Creativity test	21,55	35,33	0,61	Medium

Referring to the table above, it is known that the average N-gain value from the creativity test is 0.61 which is in the medium category. These results indicate that the implementation of project-based E-instruments assisted by digital learning platforms is effective in increasing students' creativity in Indonesian language lessons. This finding is also in line with research by Irawan et al. (2026) which shows that the N-gain value of around 0.61 is in the medium category and reflects a significant increase in learning outcomes.

Systematic Reflection and Documentation Stage

In the Systematic Reflection and Documentation stage, the researcher writes the overall results of the research study, the research results are made in the form of scientific papers and published. In addition, the developed products are registered

to obtain Intellectual Property Rights (IPR), in order to protect the originality of the products that have been developed.

4. Conclusion

Based on the results of the research, it can be concluded that the Project-Based E-instrument media assisted by the Digital Learning Platform developed has a very good level of validity, practicality, and effectiveness so that it is suitable for use in Indonesian language lessons in grade IV elementary school. This e-instrument has met the eligibility criteria from material and media experts, and is considered easy to use and attractive by teachers and students. The implementation of media at SD 21 Tolomundu, Bima City, shows that the use of project-based E-instrument media can increase students' creativity. So that this media can be used as an alternative innovative learning media that is effective to create Indonesian lessons that are more meaningful, interesting, and in accordance with the characteristics of elementary school students.

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