

Development of an IPAS E-Module Based on the Contextual Approach for Third-Grade Elementary School Student

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Article history

Submitted: 2026/06/06; Revised: 2026/07/21; Accepted: 2026/08/16

Abstract

The development of Science and Technology (IPTEK) has progressed very rapidly and has a great influence in various fields of life, including in the world of education. This research aimed to develop a contextual approach-based IPAS E-Module for third-grade students at SD Negeri Rejosari that is valid, practical, and effective. This research employed the Research and Development (R&D) method using the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The subjects of this study were third-grade students of SD Negeri Rejosari. Data were collected through questionnaires and tests. The product validation results conducted by experts showed that the E-Module obtained a score of 0.94 from the language expert, 0.94 from the media expert, and 0.81 from the material expert, with an average score of 0.90, indicating that the product was categorized as highly valid. The practicality test, conducted through one-to-one trials, teacher assessments, and small-group trials, yielded an average score of 82%, which was categorized as highly practical. The effectiveness test results, based on the comparison of pretest and posttest scores, showed an N-Gain score of 0.71, which falls into the high category. Therefore, the contextual approach-based IPAS E-Module for third-grade students at SD Negeri Rejosari is considered valid, practical, and effective for use in IPAS learning at the elementary school level.

Keywords

Contextual Approach, E-Module, IPAS.



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1. INTRODUCTION

The development of Science and Technology (IPTEK) has progressed very rapidly and has a great influence in various fields of life, including in the world of education. Mulyani & Haliza (2021) argue that advances in digital technology have encouraged changes in the learning process, where learning activities no longer depend entirely on printed teaching materials, but have begun to shift to the use of digital-based learning media and resources. Digital technology is currently used in education both as a means to access information and as a supporting medium in learning activities.

Husaini (2017) stated that technological developments in the world of education allow educators and students to search and obtain knowledge information quickly through the

internet. The use of technology in learning is one of the efforts of teachers to adapt to the demands of 21st century learning. According to Hilmi & Hasaniyah (2023), technology-based learning media is a means of delivering learning materials by utilizing digital resources to support teaching and learning activities.

However, the reality on the ground shows that there is a real *gap* between these ideal demands and the real conditions in schools. Based on a preliminary study at SD Negeri Rejosari, the learning process of science in grade III was found to be monotonous because it was dominated by the use of text-intensive conventional textbooks. Interactive digital learning media has not been utilized optimally, so learning does not involve the activeness of students independently. As a result, the majority of students consider social studies to be a difficult and boring subject. The impact of the limitations of this innovative media is reflected in the low learning outcomes of students, where 53% of students have not been able to achieve the set Learning Goal Achievement Criteria (KKTP) (70), with an average class score of only 63.15.

Empirically, research gaps have also been found in various previous studies. The development of IPAS e-modules in elementary schools is still dominated by research in grades IV and V, while research focusing on grade III students is still relatively limited. This can be seen from various research on the development of IPAS e-modules conducted on grade IV elementary school students (Putra & Rahmi, 2023). Meanwhile, grade III students are still in the concrete operational stage, so learning requires visual-rich media and provides a learning experience that is close to real life so that concepts are easier to understand (Rahmayanti, 2025). In addition, many of the digital teaching materials developed are still general so they do not fully accommodate the potential of the local environment as a context for learning IPAS.

This condition emphasizes the need for alternative solutions in the form of developing teaching materials that are innovative, adaptive to technology, but still grounded to the reality of students. The use of appropriate digital learning media has been shown to be positively correlated with improving learning outcomes and student motivation (Arisanti et al., 2020). One promising solution is the development of e-modules based on a contextual approach. E-modules not only function as a digital learning resource, but also as an interactive multimedia media that integrates text, images, and video (Rohmah et al., 2022). The contextual approach in the e-module will help students relate the IPAS material to their real-life experiences (Mashudi & Azzahro, 2020).

The novelty of this research lies in the structural integration between the characteristics of the contextual approach that is adjusted to the local wisdom of the environment around SD Negeri Rejosari into an interactive e-module specially designed for grade III elementary school students. This e-module combines visualisation videos of local natural/social phenomena, child-friendly self-paced interactive evaluation features, and student daily project-based activity guides. In line with recent research, the use of contextual digital teaching materials has been proven to be effective in triggering focus, attracting attention, and boosting student learning completeness in the basic transition phase (Rukman & Samsudin, 2025).

Therefore, this study aims to develop, test the feasibility, and test the effectiveness of products in the form of Contextual Approach-Based Science E-Modules in Grade III Students of SD Negeri Rejosari. Through this research, it is hoped that digital learning media can be produced that is not only feasible and visually appealing, but also empirically effective in improving the quality of the process and learning outcomes of IPAS in the elementary school realm.

2. METHODS

This research uses the ADDIE development model developed by Robert Maribe Branch. According to Branch (2009:20) the ADDIE model is a learning product development paradigm consisting of five main stages, namely *analyze*, *design*, *develop*, *implement*, and *evaluate*, which is used as a systematic framework in designing effective learning. Rachma et al., (2023) The ADDIE Model is one of the instructional development models that is widely used in the education sector because it provides systematic stages in designing, developing, and evaluating learning programs.

In addition, Syahid et al., (2024) explained that the ADDIE model consists of five stages, namely *Analysis*, *Design*, *Development*, *Implementation*, and *Evaluation*. This model emphasizes the process of developing learning that is carried out systematically. Each stage has a different function, ranging from analyzing the needs of students, designing learning strategies and materials, developing products, implementing them in the learning process, to conducting evaluations as a basis for product improvement. According to Slamet (2022), the ADDIE model is one of the development models commonly used in R&D research, especially for developing learning media or teaching materials. The test subjects in this study were grade III students of SD Negeri Rejosari which amounted to 19 students, as well as grade III homeroom teachers as practitioner experts. The procedure for developing the IPAS e-module based on this contextual approach is carried out through five systematic stages as follows:



Figure 1. Stages of ADDIE Development Model

The Analysis stage is carried out through observation and interview activities. The analysis includes three aspects, namely *need analysis*, performance analysis, and material analysis. The results of the analysis show that teachers need teaching materials that are more interesting and interactive, learning is still dominated by lecture methods so that students tend

to be passive, and the material chosen is IPAS Chapter 5 *Me and My Environment* Topic C *Natural and Artificial Appearances in My Area* because it is in accordance with the environment around the students. According to Latip (2022), the analysis stage aims to identify the needs, characteristics of students, and learning problems as the basis for product development.

The Design stage is carried out by compiling an *e-module blueprint* which includes identity, introduction, instructions for use, introduction, reading materials, learning activities, evaluation quizzes, and closing. The e-module is designed with a display that suits the characteristics of grade III elementary school students and is developed in a web-based digital format so that it can be accessed through *smartphones* and laptops. According to Laili (2019), the design stage is the process of compiling the structure, appearance, and flow of learning media as a guideline at the development stage.



Figure 2. E-Module Display Design

The Development stage is carried out by realizing the design of the e-module into a ready-to-use product. Development was carried out using the Canva application to design the appearance of the e-module, the Heyzine platform to turn the e-module into an interactive flipbook, and the Wordwall application to create interesting practice questions. According to Silitonga et al. (2022), the development stage is the process of producing e-modules in accordance with the design that has been made, then validated by experts to ensure that the product meets the feasibility aspect before being tested. In line with that, Tarigan (2025) stated that at the *development* stage, the preparation of learning products is carried out systematically followed by expert validation so that the products developed meet the feasibility criteria before being used in learning.

Furthermore, the e-modules that have been developed are validated by subject matter experts, media experts, and linguists to assess the feasibility of the product. The validation results are used as a basis for revising and improving the e-module in accordance with the criticism and suggestions given. After that, individual trials (*one to one*) and small group trials were carried out to determine the level of practicality and attractiveness of the e-module.

The implementation stage is carried out after the e-module is declared valid and practical. At this stage, the e-module was tested on 19 third grade students of SD Negeri Rejosari

through *field testing*. According to Cahyadi (2019), the implementation *stage* is the process of applying learning products to students to determine the feasibility of use and obtaining data on the practicality and effectiveness of the product. In line with that, Lovenia et al. (2023) explained that the implementation stage aims to apply e-modules to real learning so that the success of the product in supporting the learning process of students can be known. The effectiveness of e-modules is measured through a comparison of pretest and posttest results which are analyzed using N-Gain values to determine the improvement in student learning outcomes after using e-modules.

At the evaluation stage, an assessment of the implementation results is carried out to determine the feasibility and effectiveness of the e-modules developed. The evaluation was carried out by analyzing student learning outcomes as well as the responses of teachers and students to the use of e-modules. The results of the evaluation are used as a basis for making improvements and improvements to the product so that the e-modules developed meet the criteria of valid, practical, and effective.

The data obtained was analyzed to determine the quality of the e-modules developed based on aspects of validity, practicality, and effectiveness. Data analysis was carried out using three analysis techniques, namely validity test with the Aiken's V formula, practicality test with the percentage formula, and effectiveness test with the N-Gain formula. The validity test aims to determine the feasibility level of the e-module based on the assessment of validators consisting of linguists, media experts, and material experts. The validity analysis uses Aiken's V formula as follows.

$$V = \frac{\sum s}{[n(c-1)]} \text{ (Retnawati, 2016:18)}$$

Description:

s = r-lo

lo= The lowest validation score score (in this case = 1).

c = Highest validation score score (in this case 5).

r = The score given by an assessor.

n = Number of Assessors.

The practicality test aims to determine the level of practicality of using e-modules based on the responses of teachers and students. The data was analyzed using the following percentage formula.

$$P = (Riduwan, 2015:15) \frac{F}{N} \times 100\%$$

Description:

P = Percentage of practicality

F = Total score obtained

N = Score maximum

The effectiveness test aims to determine the improvement of student learning outcomes after using the e-module. The analysis was carried out by calculating the N-Gain value based on the results of the pretest and posttest using the following formula.

$$$$

$$g) = \frac{(skor\ posttest) - (skor\ pretest)}{(skor\ maksimal) - (skor\ pretest)} \text{ (Lastrijanah et al., 2017:93)}$$

The N-Gain value obtained is then interpreted into the low, medium, or high categories according to the criteria that have been set.

3. RESULTS AND DISCUSSION

The validity test of the social studies teaching module based on *Contextual Teaching and Learning* (CTL) was carried out by three expert validators. The results of the assessment are calculated using Aiken's formula with the following data:

Table 1. Results of the Expert Validation Recapitulation (Aiken's V Index)

No.	Validation Components	Index Score V	Klasifikasi
1.	Linguist Validation	0,94	Very valid
2.	Media Expert Validation	0,94	Very valid
3.	Subject Matter Expert Validation	0, 81	Very valid
Total		2,69	Very valid
Average		0,90	

Based on the data in Table 1, the average value of the validity index was 0.90 ($V > 0.80$), which is included in the very valid category. These results show that the IPAS e-module based on a contextual approach meets the eligibility criteria so that it is suitable for use in the learning process.

The practicality of the e-module is assessed based on the teacher's response to the ease of use of the product and the student's response to the readability and ease of use of the e-module. The results of the analysis of the percentage of practicality questionnaires are presented in a concise manner in Table 2.

Table 2. Results of the Module Practicality Questionnaire Recapitulation

No.	Practicality Test Level	Percentage of Practicality	Criteria
1.	Teacher response questionnaire	86%	Very Practical
2.	Individual trials (<i>one to one</i>)	76%	Practical
3.	Small <i>group trials</i>	85%	Very Compact
Total average		82%	Very Practical

Based on Table 2, based on the results of the recapitulation of teacher and student assessments, a level of practicality of 82% was obtained with the category "Very Practical". Thus, it can be concluded that the IPAS e-module based on a contextual approach is very practical to use in the learning process.

The effectiveness test was measured quantitatively through a comparison of the scores of students' cognitive learning outcomes before (*pretest*) and after (*posttest*) the implementation of the module in grade IV. The following are the results of the effectiveness test in Table 3:

Table 3. Results of Pretest and Posttest Classical Completeness Analysis

No.	Learning Outcome Measurement	Average score	N-Gain Value	Klasifikasi
1.	<i>Pretest</i>	43,95	0,71	Height
2.	<i>Posttest</i>	83,42		

Based on the data in Table 3, students' learning outcomes showed an improvement after using the social studies e-module based on a contextual approach. The results of the *pre-test* and *post-test analysis* resulted in an N-Gain value of 0.71 ($g > 0.7$), which is included in the high category. These results show that the IPAS e-module based on a contextual approach is effectively used in improving student learning outcomes in the third grade of science learning at SD Negeri Rejosari. The visualization of improving student learning outcomes is presented in the form of a bar diagram in Figure 1.

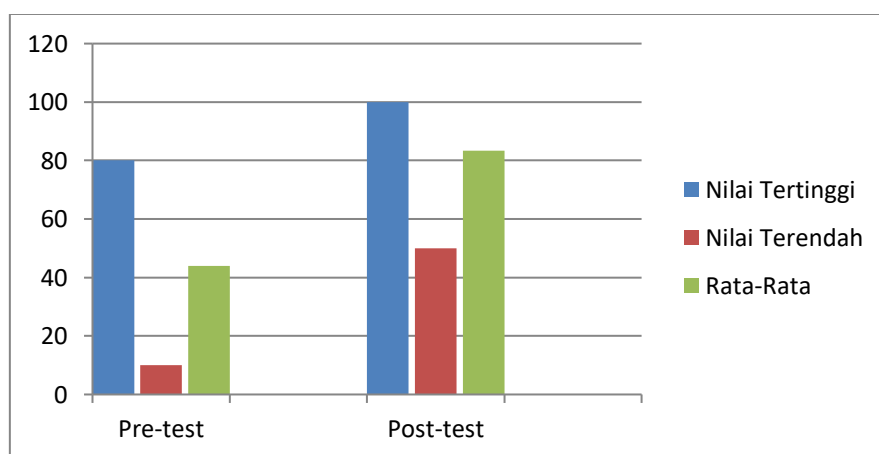


Figure 2. Diagram Pretest and Posttest Results

Discussion

This development research shows that the application of the ADDIE model has succeeded in producing an IPAS e-module based on a contextual approach that meets three product quality criteria, namely valid, practical, and effective. The results were obtained through the Analysis, Design, Development, Implementation, and Evaluation stages which were carried out systematically so as to produce e-modules that are in accordance with the characteristics and needs of grade III students of SD Negeri Rejosari.

Based on the results of the validity test, the e-module obtained an Aiken's V score of 0.94 from linguists, 0.94 from media experts, and 0.81 from material experts. The three values are

in the category of very valid, which shows that the e-module has met the aspects of language, material presentation, and media display. The use of communicative language, materials that are appropriate to learning outcomes, and attractive and easy-to-use e-module designs are factors that support the high level of product validity. The results of this study are in line with previous research which stated that teaching materials based on a contextual approach are able to improve the quality of learning because the material is presented in accordance with the experience and real environment of students.

The practicality aspect showed that the e-module obtained a percentage of 86% in the teacher's response with the very practical category, 76% in the one-to-one trial with the practical category, and 85% in the small group trial with the very practical category. These results show that e-modules are easy to use in the learning process, both by teachers and students. Attractive display, simple navigation, easy-to-understand language, and systematic presentation of materials make it easier for students to participate in learning activities independently. This shows that e-modules are not only feasible to use, but also able to support the learning process to be more effective and efficient.

Based on the results of the effectiveness test, the e-module obtained an N-Gain value of 0.71 which is included in the high category. These results show that the use of e-modules based on a contextual approach is able to improve the learning outcomes of third grade students of SD Negeri Rejosari. The improvement in learning outcomes occurs because the material is presented by associating the learning concept with situations that are close to students' daily lives so that it makes it easier for them to understand the material being studied. In addition, the learning activities contained in the e-module encourage students to observe, discuss, and complete assignments based on real experiences so that learning becomes more meaningful.

The improvement in learning outcomes is inseparable from the application of components in a contextual approach that are integrated into the e-module. Through observing the surrounding environment, discussing, doing exercises, and reflecting, students get the opportunity to build understanding based on their own learning experiences. Learning is no longer teacher-centered, but actively involves students in the process of discovering concepts. Thus, the IPAS e-module based on the contextual approach developed has proven to be valid, practical, and effective so that it is suitable for use as teaching material in science learning in grade III of elementary school.

4. CONCLUSION

Based on the results of research and development of IPAS e-modules based on a contextual approach in third grade students of SD Negeri Rejosari, it can be concluded that the e-module developed was declared very valid with an Aiken's V score of 0.94 from linguists, 0.94 from media experts, and 0.81 from material experts. E-modules have also proven to be practical in learning with a teacher response percentage of 86% (very practical), *one-to-one* trials of 76% (practical), and *small group trials* of 85% (very practical). In addition, the e-module was declared effective in improving student learning outcomes with an N-Gain score of 0.71 which is included in the high category. Thus, the IPAS e-module based on a contextual approach is

suitable to be used as one of the teaching materials to support the learning process of IPAS in grade III of elementary school.

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