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Development of Smart Apps Creator Interactive Multimedia Using a Problem-Based Learning Model in Indonesian Language Learning in Elementary Schools

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ABSTRACT

21st-century education requires students to possess critical, collaborative, and creative thinking skills, as well as the ability to optimally utilize information technology. However, classroom practice still shows limited use of technology, and the learning media employed have not actively engaged students. This study aims to develop interactive multimedia using Smart Apps Creator with a Problem-Based Learning (PBL) model that is valid and practical for teaching Indonesian in elementary schools. This study uses the research and development method (Research and Development) using the ADDIE model. Data were collected through observation, interviews, validation sheets, questionnaires, and tests, then analyzed to determine validity and practicality. The results show that content validity reached 95.31%, language validity 98.43%, and media validity 85.52%, all categorized as highly valid. Practicality scores were 97.08% from students and 94.44% from teachers, both categorized as highly practical. Therefore, the Smart Apps Creator interactive multimedia with a Problem-Based Learning model is considered highly valid and practical, making it feasible for use in Indonesian language learning in elementary schools.

1. Introduction

Education in the era of the Industrial Revolution 4.0 plays an important role in preparing a generation that is ready to face technological advances that continue to develop, and dynamic. Education no longer only focuses on academic aspects, but also on developing 21st-century skills, namely critical thinking, creativity, collaboration, and digital literacy (Yusuf, 2023). This is in line with the opinion of Frydenberg & Ando (as cited in Sabaruddin, 2022) which states that 21st century learning is learning that applies critical thinking skills, knowledge, and digital literacy skills, information literacy, media literacy, and mastering information and communication technology, with the aim of producing graduates who are ready to compete in the era of globalization.

Effectively integrating technology in learning is an important aspect in facing challenges and optimizing learning potential in the digital era (Subroto et al., 2023). In this context, technology is considered a tool that can improve the quality of teaching and learning, expand access to educational content, and encourage active engagement of learners (Yusuf, 2023). Educators are required to use technology in teaching and learning activities. This is included in Permendikbud No. 22 of 2016 concerning the primary and secondary education process which has currently been updated to Permendiknas No. 16 of 2022, one of which is the principle of learning that utilizes technology and communication efficiently and effectively (Junita & Bahri, 2024).

One way to utilize technology in the learning process is through the use of innovative learning media. Media is a tool that can be used as an introduction to a message in a lesson, so that its existence is easier to understand and can motivate students in learning (Syafira & Ahmad, 2023). Learning media not only serves as a teaching tool, but also as a means to improve interaction between educators and students (Astuti et al., 2024). In the context of an independent curriculum, effective learning media can be tailored to the characteristics and needs of students, thereby creating a more meaningful learning experience (Dwi et al., 2022).

Based on the results of observations and interviews at SDN 12 Pisang, SDN 04 Pisang and SDN 03 Binuang, the author obtained information, namely: (1) Learning media is classical; (2) The media used is in the form of pictures, and learning videos are used only at certain times. This certainly has an impact on students' focus and interest in learning in the learning process in the classroom, especially Indonesian subjects; (3) The learning media used has not involved students, namely students only pay attention to the media, without any interaction in it. This causes them to be less enthusiastic and feel bored, so the learning process becomes less effective and interesting; (4) The learning method used is the lecture and question and answer method, so that the learning activities that occur are still teacher-centered, not in accordance with the expectations of the independent curriculum, which requires a student-centered learning process (Cholilah et al., 2023).

Seeing the inequality between expectations and reality in the implementation of Indonesian learning in grade IV, the researcher is interested in proposing development research as a solution. The proposed solution is the use of interactive multimedia. The researcher proposed this interactive multimedia, as students at that developmental stage tend to understand the material more effectively through engaging and active learning experiences. (Jannah & Zen, 2023). Interactive multimedia such as images, videos, and simulations can help explain abstract concepts more concretely, so that learners will be able to easily understand learning (Widiasanti et al., 2023).

Interactive multimedia can be designed, one of which is using *the Smart Apps Creator* (SAC) application. However, to further improve the quality of the design and visualization of the material, the author proposes a combination with the Canva application, so this study will use Smart Apps Creator as the main tool in the development of interactive multimedia that can facilitate the needs of Indonesian

learning in grade IV of elementary school, while Canva is used as a supporting application to beautify the visual appearance of learning media, so as to produce media that is not only interactive but also aesthetically appealing. In order to maximize the potential of this media, it is important to implement the right learning model, one of which is *the Problem-Based Learning* (PBL) Model. In this study, Smart Apps Creator and Canva not only acted as interactive learning media, but were also integrated with PBL to support the troubleshooting stages. Through this application, students can access problems in the form of interactive multimedia, collect information independently, and develop solutions in a more interesting and exploratory way.

Previous research related to the development of interactive multimedia based *Smart Apps Creator* has been done by Syadida & Erita, (2022) with the title *Interactive Multimedia Development Using the Smart Apps Creator Application in Integrated Thematic Learning for Grade IV Elementary School*". Then the research conducted by Jaiz et al., (2022) with the title *"Development of Interactive Multimedia Based on Smart Apps Creator in Elementary Thematic Learning"*. As well as research conducted by Aziz et al., (2024) with the title *"Development of Interactive Multimedia in Social Studies Learning in Grade I Elementary School"*.

The three researchers above, developed interactive multimedia based on Smart Apps Creator in the form of products consisting of audio-visual media and visual media, in social studies, and thematic learning. Meanwhile, the author developed the *Smart Apps Creator interactive multimedia using the Problem Based Learning model* and in the form of a product consisting of audio-visual media, visual media, and accompanied by interactive quiz in Indonesian learning. This study aims to test the validity and practicality of *Smart Apps Creator interactive multimedia using the Problem Based Learning model* in Indonesian learning in elementary schools.

2. Methodology

This type of research is developmental research (Research and Development). Development research is a stage in developing a new product or improving a product that previously existed (Rustamana et al., 2024). Maghfirah et al., (2022) mention development research is a research method used to produce a certain product, and test the effectiveness of the product. In this study, the author used the ADDIE model of ADDIE development, which was developed by Dick and Carey including analysis, design, development, implementation, and evaluation (Ahyar et al., 2023). The data collection techniques in this study were carried out through observation, interviews, validation sheets, questionnaires and tests. The data analysis techniques used are data analysis, validity, and practicality.

There are two types of data that will be used in the research, namely qualitative data and quantitative data. The first data was obtained from the results of smart apps creator's interactive multimedia validation request by material, language, and media expert validators. Meanwhile, the second data was obtained from the results of the smart apps creator interactive multimedia practicality test for 1 teacher and 20 grade

IV students of SDN 12 Pisang. The data obtained from the validation results and practicality of learning media will be analyzed through the application of the Likert scale. Referring to the validation and practicality sheets, the scoring in each category can be observed in Table 1.

Table 1. List of Scoring Validity and Practicality of Learning Media

Score	Category
4	Excellent
3	Good
2	Pretty Good
1	Not Good

Source: Modification (Riduwan & Sunarto, 2015)

The overall results of the scores obtained from the previous data collection phase, derived from the validity and practicality questionnaires, were analyzed and converted into percentage values to determine the feasibility of the developed product. This process aimed to identify how well the learning media met the validity and practicality criteria. Each score was calculated and interpreted objectively based on established classification intervals. Higher percentages indicate that the media meets the expected standards, while lower percentages suggest the need for improvement. The formula used for this calculation is presented below, while the categories of validity and practicality are shown in Table 2 and Table 3.

$$NP = \frac{S}{MS} \times 100\%$$

Information:

- NP = Percent value searched
 S = Score
 MS = Maximum score
 100 = Fixed value

Table 2. Categories of Learning Media Validity

Interval	Category
86-100%	Highly Valid
76-85%	Valid
60-75%	Quite Valid
55-59%	Less Valid
00-54%	Invalid

Source: Modification (Purwanto, 2013)

Table 3. Categories of Learning Media Practicality

Interval	Category
86-100%	Very Practical
76-85%	Practical
60-75%	Quite Practical
55-59%	Less Practical
00-54%	Impractical

Source: Modification (Purwanto, 2013)

3. Results and Discussion

Analysis Stage

The analysis stage is carried out to identify the needs underlying the development of interactive multimedia. According to Azis et al., (2025) Analysis is an important first step in the development of learning media because from this analysis we can identify needs, determine the direction and scope of the material, competencies to be achieved, and the right learning strategies according to the needs of students. As well as conditions or obstacles that may be faced. This stage also helps researchers understand students' learning characteristics and classroom contexts, which are essential in selecting appropriate media elements and features. Furthermore, the results of this analysis serve as a reference in designing learning activities that are relevant, engaging, and aligned with curriculum objectives.

First, the curriculum analysis, the curriculum used at SDN 12 Pisang, SDN 04 Pisang and SDN 03 Binuang is an independent curriculum. At the curriculum analysis stage, the researcher takes several steps, namely: (1) Determining Learning Outcomes (2) Analyzing and developing Learning Outcomes to set Learning Goals, so that students can achieve the target in Indonesian lessons after using the developed product, covering aspects of attitudes, knowledge, and skills (3) Understanding the learning materials that are already contained in the Independent Curriculum teaching guidebook; and (4) Compiling the teaching module for Indonesian Language Learning grade IV Elementary School Chapter V "Exchange or pay".

Second, the analysis of student needs, the analysis of the needs carried out by the researcher is by conducting observations and interviews and distributing questionnaires to students at SDN 12 Pisang, SDN 04 Pisang, and SDN 03 Binuang related to Indonesian learning media in grade IV. The results of the analysis of learning media needs that the researcher found, namely: (1) Students experience difficulties in learning Indonesian (2) Students get bored easily if they only learn by listening to lectures from teachers, they are more interested if learning uses interactive multimedia (pictures, voices, videos, and quizzes). (3) Children, class IV tend to have shorter attention spans.

Third, the analysis of teacher needs, based on the results of observations in the three schools, the author obtained information, namely (a) Classical learning media. (b) The media used is in the form of pictures, and learning videos are used only at certain times. (c) The learning media used has not involved students, namely students only pay attention to the media, without any interaction in it. Then, based on the results of the interview, in the learning process, educators have used learning media, but it depends on the conditions and learning materials. And based on the results of the teacher needs questionnaire, the results were obtained that the learning media used, especially in Indonesian learning, was not effective and was not in accordance with the needs of the curriculum and the characteristics of students.

Design Stage

The main objective of this stage is to compile an interactive multimedia design using the *Problem Based Learning* which is in accordance with the needs of grade IV students in Indonesian learning. The principles of interactive learning design are applied, such as the use of texts, images, learning videos and interactive quizzes as an initial evaluation. The use of these elements aims to attract students' attention, increase understanding, and facilitate active involvement in the learning process. This is in line with the multimedia learning theory of the Mayer (2024) , which emphasizes that learning is more effective when text and images are presented in an integrated manner (*multimedia principle*), when audio is used to convey a narrative rather than written text (*modality principle*), and when irrelevant information is omitted (*coherence principle*).

The first step is the creation of product flowcharts and storyboards, which serve as the blueprint for the multimedia. The second step involves the selection of media and development tools, namely the Smart Apps Creator and Canva applications. Third, PBL-based materials and activities are designed to align with the curriculum and learning objectives. At this stage, the design process produces the initial appearance and navigation layout of the interactive multimedia. The layout is carefully adjusted to meet the learning objectives and suit the characteristics of fourth-grade students. This ensures that the multimedia is easy to use, visually engaging, and supports active learning. Additional features such as interactive quizzes, animations, and feedback mechanisms are incorporated to enhance student engagement. The following shows what Smart Apps Creator and Canva interactive multimedia look like, which can be seen in Figures 1, 2, 3, and 4.

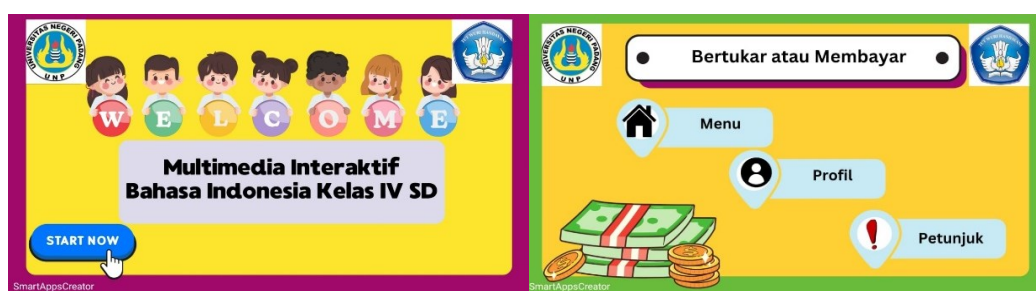


Figure 1. Interactive Multimedia Home View and Main Menu

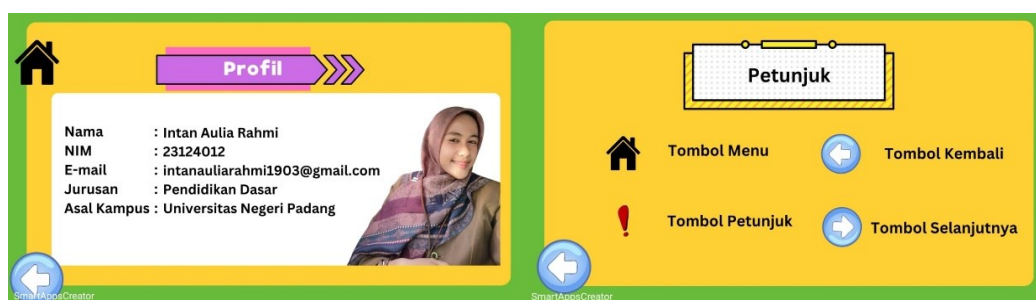


Figure 2. Profile View and Interactive Multimedia usage Instructions

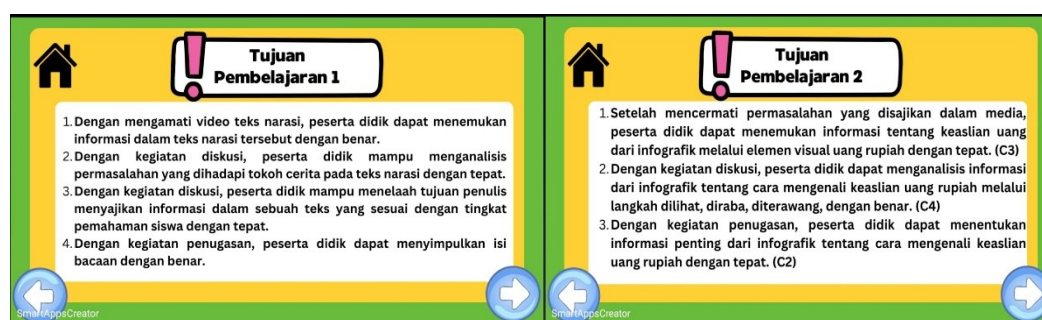


Figure 3. Interactive Multimedia Learning Objectives View

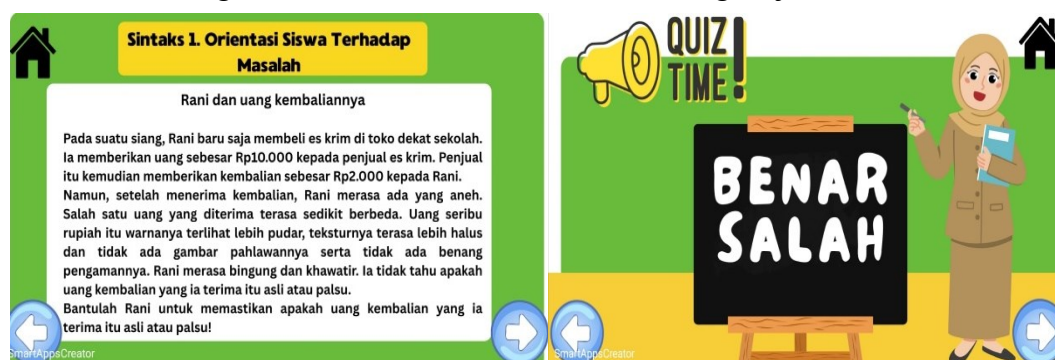


Figure 4. Display of Materials and Interactive Multimedia Quizzes

Development Stage

This stage aims to see the extent of the feasibility of the multimedia that the researcher has designed. The finished multimedia is designed to validators subject matter experts, linguists and media experts for validation. The validity test is carried out through the provision of a validation questionnaire to each expert. Validation tests by material, language, and media experts are an important phase in ensuring the feasibility of learning products before field trials. Material validation aims to ensure the suitability of content with basic competencies, clarity of concept, and consistency of material presentation (Safitri et al., 2022). Language validation ensures that the use of language is communicative, spelled, easy to understand, and appropriate for the student's level. While media validation examines visual, navigation, interactivity, and *user-friendliness* so that students can use the media effectively. Based on the results of the validation calculation on the material aspect (content feasibility), an average score of 95.31% was included in the very valid category. This shows that the content of the material is in accordance with learning outcomes, and relevant to the characteristics of grade IV elementary school students. Then based on the results of the validation calculation on the Language aspect, obtaining an average score of 98.43% is included in the very valid category. This score shows that the linguistic aspect in multimedia has met the eligibility standards and strongly supports the learning process. Based on the results of the validation calculation on the media aspect, an average score of 85.52% was included in the very valid category. Based on the recapitulation of the results of the validation test on interactive multimedia *Smart Apps Creator* Using the model

Problem-Based Learning (PBL) is in the range of very valid categories with an overall average score of 93.08% and is feasible to be implemented in learning. Suggestions and inputs on the validation sheet are used as a reference for the revision of the developed teaching materials.

Implementation Stage

The implementation stage is a follow-up step after the development process. At this stage, interactive multimedia based on Smart Apps Creator with a Problem Based Learning model is implemented in real life at the elementary school that is the main research subject, namely SDN 12 Pisang which consists of 20 students. The purpose of this stage is to assess the practicality of media in Indonesian learning grade IV. In line with opinion Yuliana et al (2023) At the implementation stage, a practicality test was carried out which aimed to find out the extent to which the developed learning media could be used easily and in accordance with real conditions in the classroom. The test involved direct observation and feedback from both students and teachers. The results provided valuable insights into the effectiveness and usability of the multimedia in supporting student learning activities.

Evaluation Stage

The meaning of the evaluation stage is the final stage of the research carried out. When at this stage, evaluation activities are carried out by referring to the results of the assessment from the teacher and student response questionnaires to assess the extent of the practicality of using the interactive multimedia that has been designed. Branch explained it in more detail (as cited in Marji et al., 2020), the evaluation stage in the ADDIE model aims to ensure that the developed product meets the learning objectives and has a real impact on the learning process and outcomes. The practicality test aims to find out the extent to which the developed learning media can be used easily and in accordance with real conditions in the classroom. Data collection was carried out through a practicality questionnaire that was distributed to students and teachers after the learning took place. The score obtained from the teacher's response practicality test at SDN 12 Pisang was 94.44% with the very practical category, while the score obtained from the student response practicality test was 97.08% with the very practical category.

4. Conclusion

Based on the research conducted through the development of interactive multimedia products using the Problem Based Learning model, it can be concluded that the developed media is highly valid and practical for use in Indonesian language learning at the elementary school level. The media's content, language, and presentation are well-aligned with the curriculum and student characteristics, enabling students to understand concepts and learning materials more interactively. Practicality is demonstrated through positive responses from students and teachers, indicating that the media is user-friendly and effectively supports learning activities. Students were more motivated, actively engaged, and participated

meaningfully in lessons, while teachers could facilitate the learning process efficiently using the media's interactive features. This demonstrates that PBL-based multimedia can enhance student-centered learning and strengthen problem-solving skills. In addition, the media is visually appealing, easy to use, and adaptable to classroom needs, creating an enjoyable and effective learning experience. Overall, the study confirms that Smart Apps Creator interactive multimedia is an innovative and effective tool for teaching Indonesian in elementary schools. Its implementation provides a practical model for integrating interactive multimedia into educational settings, offering valuable insights for improving teaching and learning processes.

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