

Developing the Local Wisdom-Based Pop-Up Book for Fifth-Grade Students

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ABSTRACT

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Within the context of *Kurikulum Merdeka* (Indonesian Curriculum), traditional teaching methods often fail to engage elementary students effectively, leading to boredom and limited learning experiences. To address this, a study was conducted at a public primary school in Wonosobo Regency, revealing the need for interactive learning materials. This research focuses on developing Local Wisdom-based Pop-Up Books tailored for fifth-grade students in Indonesia. Through rigorous evaluation by experts and positive feedback from teachers and students, the Pop-Up Books prove to be highly effective in enhancing learning outcomes. Statistical analysis confirms significant improvements in student performance after using the Pop-Up Books. This study highlights the importance of innovative learning media in enriching educational experiences for elementary students.

Keywords

Elementary School

Learning Media

Local Wisdom

Pop-Up Book

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Introduction

The Independent Curriculum integrates science into social studies, aiming to cultivate critical thinking skills. This integration, termed Ilmu Pengetahuan Alam dan Sosial (IPAS) at the elementary level, aligns with students' holistic perception and simplifies learning [1]. IPAS plays a vital role in shaping the Pancasila Student Profile (the unique student profile in Indonesia), reflecting the ideal Indonesian student. However, traditional science education

must evolve to captivate students' curiosity and interest [2]. IPAS introduces students to the earth's features, including water bodies, landforms, and atmospheric layers [3]. Leveraging Indonesia's rich natural and cultural heritage, IPAS incorporates local wisdom to enhance learning experiences [4]. The policy of Merdeka Belajar (freedom to learn) empowers educational units to innovate in line with local culture and resources [5].

The focus of elementary science education shifts from content absorption to competency development [4]. IPAS merges science and social studies, simplifying complex concepts into three domains: lithosphere, hydrosphere, and atmosphere. To facilitate comprehension, IPAS integrates local wisdom and utilizes engaging media such as Pop-Up Books [6]. Observations at a public elementary school revealed the limitations of conventional teaching methods, leading to student disengagement [7]. Teachers face challenges in using digital media due to equipment constraints and power outages. Consequently, there is a pressing need for versatile learning media like Pop-Up Books to sustain student interest and facilitate effective learning experiences. The objective of this study is to develop and implement Local Wisdom-based Pop-Up Book media as an innovative learning tool to enhance the teaching of IPAS for fifth-grade students in elementary schools.

This research aims to develop a Pop-Up Book for science education in 5th-grade classrooms that is both effective and appropriate. This educational resource will incorporate elements of local wisdom, ensuring that the content is relevant and culturally meaningful for the students. By integrating local knowledge and traditions, the Pop-Up Book is intended to enhance the learning experience and promote a deeper understanding of science concepts within the context of the student's community and heritage.

Material and Methods

The research follows the Research and Development (R&D) methodology, utilizing the ADDIE model (Analyse, Design, Development, Implementation, Evaluation) by Dick and Carey [8]. The choice of the ADDIE model ensures continuous evaluation and improvement throughout the development process.

The research design includes various trials to validate and assess the quality and feasibility of the developed Pop-Up Book media for fifth-grade Social Studies. These trials involve:

- Validation by media, material, and learning experts to assess quality and suitability.
- Feedback collection from fifth-grade teachers and students at two public elementary schools in Wonosobo, to gauge response to the media.
- Effectiveness testing through pretest and posttest assessments at a school to measure learning outcomes.

- Interviews with teachers at a school to gather insights on the use of Pop-Up Book media.

These trials are essential for ensuring the effectiveness and suitability of the Pop-Up Book media for the fifth-grade Social Studies curriculum, based on local wisdom and natural appearance themes. The study involves fifth-grade students from two schools (15 students from the first school and 30 students from the second school). Data collection utilizes interviews and research sheets. An interview involves asking questions face-to-face to understand respondents' perspectives and obtain in-depth insights into the research topic. Questionnaires with Likert scales are used to gather responses from experts and participants to assess various aspects of the research. Product Trial Instruments assess aspects of the attractiveness and effectiveness of the Pop-Up Book media. They include assessment sheets for teachers and response sheets for students. Qualitative data analysis includes input and feedback from experts and teachers. Recommendations for improvement are identified, addressing aspects such as font readability, content relevance, and overall usability of the Pop-Up Book media.

Results

The assessment results from media experts, material experts, learning experts, teachers' responses, and student feedback provided quantitative data regarding the effectiveness of Pop-Up Book media based on Local Wisdom material for fifth-grade elementary school students. Figure 1 shows the final product of the Pop Up Book.



Fig. 1. Some pages of the Pop Up Book

According to Table 1, media, material, and learning experts awarded scores of 96%, 87.2%, and 82% respectively. Combining these percentages and averaging them yields a score of 88.4%, indicating high quality. Therefore, it can be concluded that the Pop-Up Book Media based on Local Wisdom, focusing on natural appearance for fifth-grade elementary school, is of very high quality.

Table 1. Expert Validation

No	Valuation	Percentage	Category
1	Media Expert	96.0%	Highly qualified
2	Material Expert	87.2%	Highly qualified
3	Learning Experts	82.0%	Highly qualified
Sum		265.2%	
Average rating		88.4%	
Category		Highly qualified	

After trials during the learning process, fifth-grade teachers assessed the Local Wisdom-based Pop-Up Book Media, focusing on natural materials, at 100%, indicating it falls within the highest quality category. Consequently, it can be concluded that the Pop-Up Book Media, based on Local Wisdom and emphasizing natural appearances, is of high quality for fifth-grade elementary school students.

Following thorough testing in the learning process, fifth-grade students evaluated the Pop-Up Book media, centered around Local Wisdom and features natural materials, awarding it a perfect 100% score in the very high-quality category. This resounding assessment underscores the strong feasibility of employing the Local Wisdom-based Pop-Up Book, affirming its suitability and effectiveness in educational settings.

As indicated in Table 2, the collective average assessment scores provided by media experts, material experts, learning experts, linguists, teachers, and students amounted to 96.13%, positioning it firmly within the highly qualified category. Thus, it is evident that the Pop-Up Book media, rooted in Local Wisdom and emphasizing natural materials, is of exceptionally high quality for fifth-grade elementary school students.

Table 2. Average Data of Expert, Teacher, and Student Assessment

No	Valuation	Percentage Value	Category
1	Media Expert	88,4%	Highly qualified
2	Teacher	100%	Highly qualified
3	Student	100%	Highly qualified
Sum		288,4%	
Average rating		96,13%	
Category		Highly qualified	

The efficacy of the Pop-Up Book media, which is grounded in Local Wisdom and showcases natural materials, for fifth-grade elementary school students, was evaluated via a one-group pretest-posttest conducted among 30 students in fifth grade. The assessment process involved several stages, including a normality test, a homogeneity test, and the utilization of a paired sample t-test. The paired sample t-test was utilized to ascertain the significance of variances between pretest and posttest conditions, with a significance level set at 0.05. The outcomes of the paired sample t-test are delineated in Table 3.

Table 3. The paired sample t-test

Paired Samples Test		Paired Differences			95% Confidence Interval of the Difference		t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair	Pre-Experiment - PostExperiment	-45.267	9.490	1.733	-48.810	-41.723	-26.125	29	.000

The paired sample t-test outcomes, outlined in Table 3, revealed a significance value of <0.000 , suggesting a rejection of the null hypothesis (H_0) and acceptance of the alternative hypothesis (H_a). This indicates notable disparities between the conditions before and following the implementation of the Pop-Up Book Media, which is grounded in Local Wisdom and highlights natural features, for fifth-grade elementary school students. As a result, it can be conclusively inferred that the Pop-Up Book Media, which emphasizes Local Wisdom material and natural characteristics, is indeed effective for integration within this educational framework.

Discussion

The developed Pop-Up Book media is a visually engaging print media that integrates text and images in an interactive format, requiring students to manipulate elements such as dragging, opening, shifting, and flipping within the book. According to Ref. [9], educational media like this enhance the learning process by providing clear direction, organization, and alignment with educational objectives. The Pop-Up Book, based on Local Wisdom and designed for fifth-grade elementary schools, offers several advantages. Firstly, it presents captivating narratives starting from dimensional illustrations, with certain parts shifting when the pages are opened, creating an element of surprise. This surprise element not only captures the reader's attention but also fosters anticipation for what lies ahead on the next page. Additionally, the immersive storytelling experience strengthens student engagement and enthusiasm in learning activities, as noted by Ref. [10]. Their research highlights the ability of Pop-Up Books to attract attention through unique embossed shapes, vivid colors, and tangible representations of abstract concepts. Furthermore, the incorporation of local wisdom adds depth to the educational experience. According to Ref. [11], local wisdom encompasses the accumulated knowledge, beliefs, norms, and cultural insights passed down through generations, shaping the identity and values of a community. Ref. [11] further emphasizes that local wisdom serves as a guide for appropriate action in life, reflecting the cultural richness and geographical context of a particular area. In essence, local wisdom represents the cultural heritage and distinctive characteristics of a region, underscoring its significance in educational materials tailored to specific communities.

Local wisdom serves multiple crucial functions in the educational and social context. Firstly, it fosters a sense of appreciation for local values within the community, acting as a means to preserve these values amidst the rapid changes brought about by globalization [12]. In a world where cultural homogenization often threatens to overshadow local traditions and practices, local wisdom plays a vital role in maintaining cultural diversity. By instilling a love for local wisdom, it ensures its continuity and transmission to future generations, thereby enriching their knowledge and understanding of their cultural heritage. [13] This cultural education helps young people develop a strong sense of identity and belonging, which is essential for their personal and social development.

Incorporating local wisdom into educational materials contributes significantly to a deeper comprehension of concepts [14]-[16]. It extends beyond mere theoretical knowledge, offering students practical applications in their daily lives and environments. For instance, traditional ecological knowledge can enhance students' understanding of sustainable practices and environmental stewardship, which are increasingly important in today's world. Local wisdom can also provide contextually relevant examples and case studies that make learning more relatable and meaningful for students, thereby improving their engagement and retention of information [17].

Moreover, integrating local wisdom into education supports the development of critical thinking and problem-solving skills. Students learn to value diverse perspectives and approaches, fostering a more holistic and inclusive worldview [18]. This approach not only enriches the curriculum but also prepares students to navigate and contribute to a multicultural and interconnected global society.

Furthermore, the use of local wisdom in education can bridge the gap between school and community, creating a more cohesive and supportive learning environment [19]. It encourages community involvement in the educational process, as elders and cultural practitioners can be invited to share their knowledge and experiences. This intergenerational exchange benefits both students and the community, reinforcing social bonds and mutual respect.

Conclusion

Local wisdom is a vital component of education that enhances cultural preservation, enriches learning experiences, and fosters critical thinking and community cohesion. Its inclusion in educational materials ensures that students receive a well-rounded education that prepares them not only academically but also socially and culturally. As such, educators and policymakers should prioritize the integration of local wisdom into curricula to promote a deeper, more meaningful education that respects and celebrates cultural diversity. The

research and development of Pop-Up Book media for fifth-grade elementary school students, focusing on natural appearance material, adhered to the ADDIE development model. The Pop-Up Book media based on Local Wisdom's natural appearance material demonstrated efficacy for fifth-grade elementary school students. However, the research's scope is limited, focusing solely on fifth-grade students and "acquaintance with our earth" material, with progression only to the effectiveness test stage, without mass production.

Conflict of Interest

The authors should declare that there is no conflict of interest.

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